Clinical Practice Guidelines for management of Suicidal Behaviour

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Introduction

Suicidal behavior can be broadly subdivided into suicide related behavior and suicide-related communication. Amidst the broad array of confusing terms with varying meanings, the terms as used in this guideline have been clarified for the sake of uniformity of communication and approach between clinicians. [Table 1]. Given below is a simple schematic outline of self-injurious behavior which is commonly accepted among suicidologists. [Fig. 1]

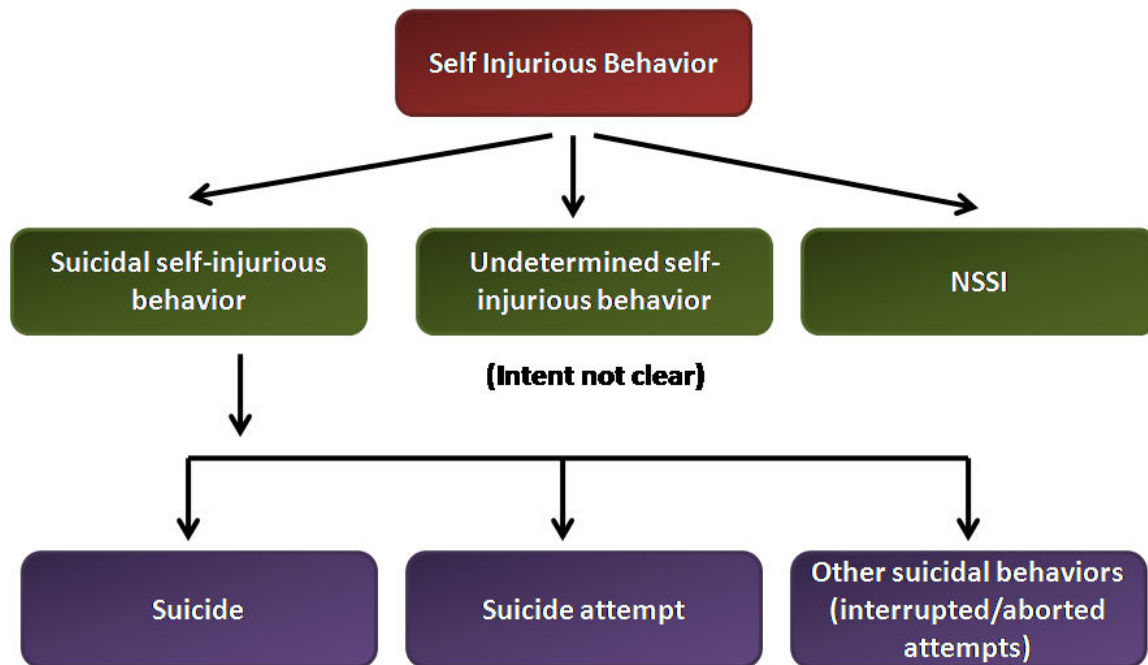**Figure 1.   Classification of Self-injurious behavior (Crosby, 2009)**

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                        ┌─────────────────────────┐
                        │  Self Injurious Behavior │
                        └─────────────────────────┘
             ┌───────────────────┼───────────────────┐
             ▼                    ▼                   ▼
   ┌──────────────────┐  ┌──────────────────┐  ┌──────────────┐
   │ Suicidal self-   │  │ Undetermined     │  │              │
   │ injurious        │  │ self-injurious   │  │     NSSI     │
   │ behavior         │  │ behavior         │  │              │
   └──────────────────┘  └──────────────────┘  └──────────────┘
             │                (Intent not clear)
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   ┌─────────┴──────────────────────┬─────────────────────┐
   ▼                                ▼                      ▼
┌──────────┐              ┌──────────────────┐  ┌────────────────────┐
│ Suicide  │              │ Suicide attempt  │  │ Other suicidal     │
│          │              │                  │  │ behaviors          │
│          │              │                  │  │ (interrupted/      │
│          │              │                  │  │ aborted attempts)  │
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Table 1 Definition of common terminology used in this Guideline

Suicidal Ideation- Thoughts about self-harm, with deliberate consideration or planning of possible techniques of causing one's own death[1]

Suicide Attempt- A self-inflicted, potentially injurious behavior with a nonfatal outcome for which there is evidence (either explicit or implicit) of intent to die[2]

Aborted or interrupted attempt -Aborted suicide attempt—potentially self-injurious behavior with evidence (either explicit or implicit) that the person intended to die but stopped the attempt before physical damage occurred.[3]

Suicide- The act of intentionally causing one's death[1]

Self-harm/Deliberate Self -harm/Non-Suicidal Self Injury-
When an individual engages in inflicted self-damage to the surface of his/her body with the expectation that the injury will lead to minor or moderate physical harm. Thus, suicidal intent is absent. The absence of suicidal intent can either be stated or inferred from the circumstances.[1]

Suicide -related communication involves suicidal threat and suicidal plan.
Suicidal threat- Any interpersonal action, verbal or nonverbal, without a direct self-injurious component, that a reasonable person would interpret as communicating or suggesting that suicidal behaviour might occur in the near future[2]
Suicidal plan- Proposed method of carrying out a design that will lead to a potentially self-injurious outcome[2]

Epidemiology

Across the world, nearly 8,00,000 people die by suicide every year andnearly 74% of suicides occur in low- and middle-income countries. According to WHO's Global Health Estimates, the global age-standardized suicide death rate (SDR) was 9.0 per 1,00,000 population for 2019.[4] Suicide is the second most common cause of death among young people aged 15–29 years of both sexes globally. Suicide rates in India are one of the highest globally and account for 26.6% of global suicide deaths. The suicide deaths for 2020 released by the National Crime Records Bureau (NCRB) in 2021showed a rate of 11.3 per lakh population, the actual figure amounting to 1,53,052 deaths.[5] This was the highest number of suicides recorded by India since 1971 which is quite alarming! According to NCRB data over the last few years, individuals belonging to 18-29 years age group is the most vulnerable group accounting for almost 35% of all cases of suicide.Within this group, there is an increasing trend of student suicides which have multiple reasons including academic pressure. Although suicide in women is decreasing, India still contributes 36% of global suicides in women in 15-39 year age group. Intimate partner violence is one of the most important causes of suicides in married women of India. The most common methods of suicide (in decreasing frequency) are hanging, consuming poison, drowning and self-immolation. In terms of gender, the rate of completed suicides has been gradually increasing in favor of males with the latest data showing almost 2.5 times more men dying by suicide than women. However, attempted suicides are a greater problem in the women of our country. Thus, appropriate prevention measures at the community

level along with proper risk assessment becomes essential for identifying those at risk and taking appropriate measures.

BASIC STEPS OF RISK ASSESSMENT

1. **Engagement and Therapeutic Alliance-** This is the most crucial step in risk assessment because if this step is not successfully negotiated, information derived from the patient may not be meaningful and adequate. The clinician must use empathy, active listening,respect, supportive and non-judgmental attitude towards the patient in order to build proper therapeutic alliance. Simple questions like, "Things seem to be a bit difficult for you these days" can go a long way in making the patient relaxed and open up. Proper alliance will lead to honest disclosure on the part of the patient. Wherever possible, the clinician must try to engage the family members and/or immediate support system. The family may be a very important source of additional information and support.

2. **Psychiatric Evaluation:** A thorough psychiatric evaluation is the next most important step in risk assessment. Majority of those who die by suicide have been found to have an underlying psychiatric disorder. Disorders commonly associated with suicidal behavior include depressive and mixed episodes, schizophrenia, substance use disorders (especially alcohol), anxiety disorders, borderline personality disorders and adjustment disorders. Substance use disorder, especially alcohol, confers a risk of 15-23% for suicide. Comorbidity of substance abuse with an Axis I disorder like Bipolar disorder and Depressive Disorder significantly elevates the risk than either condition alone through the common pathway of impulsivity, aggression and hostility. Among those with bipolar disorder, depressive and mixed episodes pose the greatest risk. History of current and past psychiatric diagnosis, treatment and family history of psychiatric disorders must be probed. A brief mental status examination should be done.History of coping with stresses must be elicited- whether the person has been able to manage stressful situations in the past or resorted to maladaptive ways of coping. Additional information should be gathered wherever available from friends, families and treatment records.

3. **Risk Factors:** There are several risk factors which have been variably linked to suicide. Common risk factors are mentioned in Table 2. During elicitation of risk factors, the clinician should take note of modifiable risk factors so that these can be addressed.

    Table 2Risk factors for suicide (Modifiable factors in bold) [3]

Past suicide attempt
Current or lifetime psychiatric disorders
Alcohol and abuse of other substances
Recent stressful life events
(Especially financial/relational loss)
Family history of suicide
Chronic Medical illness
History of physical/sexual abuse
Access to lethal means
Hopelessness/despair
Anhedonia
Impulsivity
Recent discharge from a psychiatric facility
Poor support system

4. **Protective Factors:** It is important to enquire about factors which may act as "suicide-counters" in individuals harboring suicidal behaviors. Knowledge of protective factors help in therapeutic intervention in individuals showing suicidal behavior. The common protective factors are enumerated in Table 3.

    Table 3 Protective Factors for Suicide [3]

Children at home
Sense of responsibility to family
Pregnancy /motherhood
Religiosity /spiritualty
Life satisfaction
Reality testing ability
Positive coping skills
Positive problem-solving skills
Positive social support and bonding
Positive therapeutic relationships
Easy access to support for help seeking

5. **Warning Signs:** Unlike risk factors, warning signs denote imminent risk for suicide just like a sudden chest pain serves as a warning sign for heart attack. Thus, warning signs denote more proximal relation to suicidal behavior apart from being subjective in nature and easily identifiable by lay persons. The working group of the American Association of Suicidology met in 2003 and developed a consensus list of warning signs which denote heightened risk of suicide. These are enumerated in Table 4.

Table 4 Warning Signs of Suicide[6]

Verbal
No reason for living; no sense of purpose in life
Feeling trapped—like there's no way out
I am a burden on others
People would be better off without me
Behavioral
Acting reckless or engaging in risky activities, seemingly without thinking
Increasing alcohol or drug use
Withdrawing from friends, family, or society
Tidying up affairs, making arrangements
Psychological
Anxiety, agitation, unable to sleep, or sleeping all the time
Dramatic changes in mood
Hopelessness

Rage, anger, seeking revenge Command hallucinations

6. **Suicide Enquiry-** Suicide enquiry involves probing suicidal ideation, plans, intent and lethality. For those who have presented with a recent attempt, enquiry should be made about all these aspects when he/she had made the attempt and also his/her current suicidal ideation. Past attempts should also be probed with special reference to attempts made in the recent past and the most severe attempts.

 a. **Ideation:** Eliciting ideation could begin with simple questions like "Have you ever felt that life was not worth living?" or "Have thoughts of harming yourself crossed your mind?". Once the response is in the affirmative, the clinician can go ahead with more specific questions to find out the following:
 Frequency, intensity and duration (in the last 48 hours, past month)

 "How often do you think about suicide?"

 "Could you rate the intensity of those thoughts on a scale

 of 1 to 10? How long do they typically last?"

 b. **Suicide Plan:** Once suicidal ideation is elicited, the clinician should make specific enquiry about the presence of a suicidal plan and whether the subject has taken any steps to put the plan into action. Questions should probe the following areas:
 Timing, location, lethality, access to means, preparatory acts

"Do you have a plan of how you would kill yourself?"

"Have you made any specific preparations?"

"Do you have poison/ weapons/drugs at home?"

 c. **Intent:** Suicidal intent reflects the intensity of a patient's wish to die and can be assessed by determining the patient's motivation for suicide as well as

the seriousness and extent of his or her aim to die, including any associated behaviors or planning for suicide.[3]

d. **Lethality of Suicidal Behavior**—Objective danger to life associated

with a suicide method or action. Lethality is to be assessed objectively

by the clinician and may not always coincide with an individual's

expectation of what is medically dangerous. For example, in many

cases of impulsive acts of pesticide poisoning, the victim consumes

pesticide on the spur of the moment without a strong intention to die

but the lethality of the agent mostly leads to the unfortunate death of

the individual.

Corroborative History- Following a suicide enquiry from the subject, corroborative history should always be sought from family members, friends, accompanying persons, treating physicians and past medical records. This is often helpful in clarifying doubts, getting a more definite picture, especially when there is a discrepancy between the patient's expressed intent and his acts. This also helps in building a support network which is essential in planning management.

Risk Assessment in Various Settings-

Emergency Department-Many a times a psychiatrist is asked to assess risk in general emergency settings where patients present with suicide attempts. In such situations, one is often faced with a crowded, noisy setting, an unfamiliar, uncooperative or intoxicated patient. It is difficult to carry out assessment in such situations and the clinician needs to wait till the situation becomes favorable or conducive to assessment. Sometimes the patient may become drowsy from the effects of intoxication and medical management and stabilization of the patient becomes a priority.

Inpatient Setting- All patients admitted with severe mental illness and substance abuse should undergo risk assessment. Repeat assessments should be done

whenever there is a change in treatment settings, worsening of the clinical condition of the patient or there is appearance of a new psychosocial stressor. Since the period immediately after discharge confers high risk of suicide, early follow-up assessments with risk estimation should be carried out.

Outpatient Setting- The clinician should keep in mind the fluctuating nature of suicidality over time. They should be especially cautious when the patient reports sudden, unexpected improvement in mood, or shows refusal or reluctance to adhere to treatment. Using information from close family members and associates becomes vital in such cases- both for better assessment and development of support system.

Use of Assessment tools- Though there are various standardized assessment tools including objective rating scales and self-report measures, it is advisable not to rely on a single assessment instrument for determining risk of suicide. Such instruments should never replace a thorough clinical evaluation based on the standard methods of risk assessment.

Table 5. Risk Stratification [7,8]

Risk Level	Risk/Protective Factor	Suicidality	Possible Interventions
High	Psychiatric diagnoses with severe symptoms or acute precipitating event; protective factors not relevant; Substance abuse/dependence; severe depression, command hallucinations; Poor support sytem	Potentially lethal suicide attempt or persistent ideation with strong intent or suicide rehearsal	Admission generally indicated unless a significant change reduces risk. Suicide precautions
Moderate	Multiple risk factors, few protective factors; moderate depression; support system inconsistent	Suicidal ideation with plan, but no intent or behavior. Preparatory acts are usually absent	Admission may be necessary depending on risk factors. Develop crisis plan including safety planning. Give emergency/crisis numbers

Low	Modifiable risk factors, strong protective factors; good support system	Thoughts of death, no plan, intent, or behavior	Outpatient referral, symptom reduction. Give emergency/crisis numbers

**Managing a patient with acute suicidal behavior**

The basic goals in management are the following-

1. Ensure immediate safety of the patient
2. Stabilize/manage medical complications if any
3. Protect the patient from self-harm
4. Effect immediate change
5. Shift focus from crisis to resolution
6. Detect and solve, as far as possible, the acute problem that precipitated the crisis
7. Involve family, partner, social support network
8. Diagnose and treat the underlying problem that predisposed the patient to suicidal behavior. [9]

Techniques of Management of Acute Suicidal Crisis

1. Remove the means (agent)

2. Safety planning

3. Planning for the future (immediate)

4. Decrease isolation (social support)

5. Decrease high risk behavioral factors

6. Decrease high risk environmental factors

7. Decrease anxiety and agitation (psychological perturbation)

8. Medication management

9. Consider hospitalization (if required)

Figure 2 outlines a simple scheme for managing suicidal behavior in an emergency setting [10]
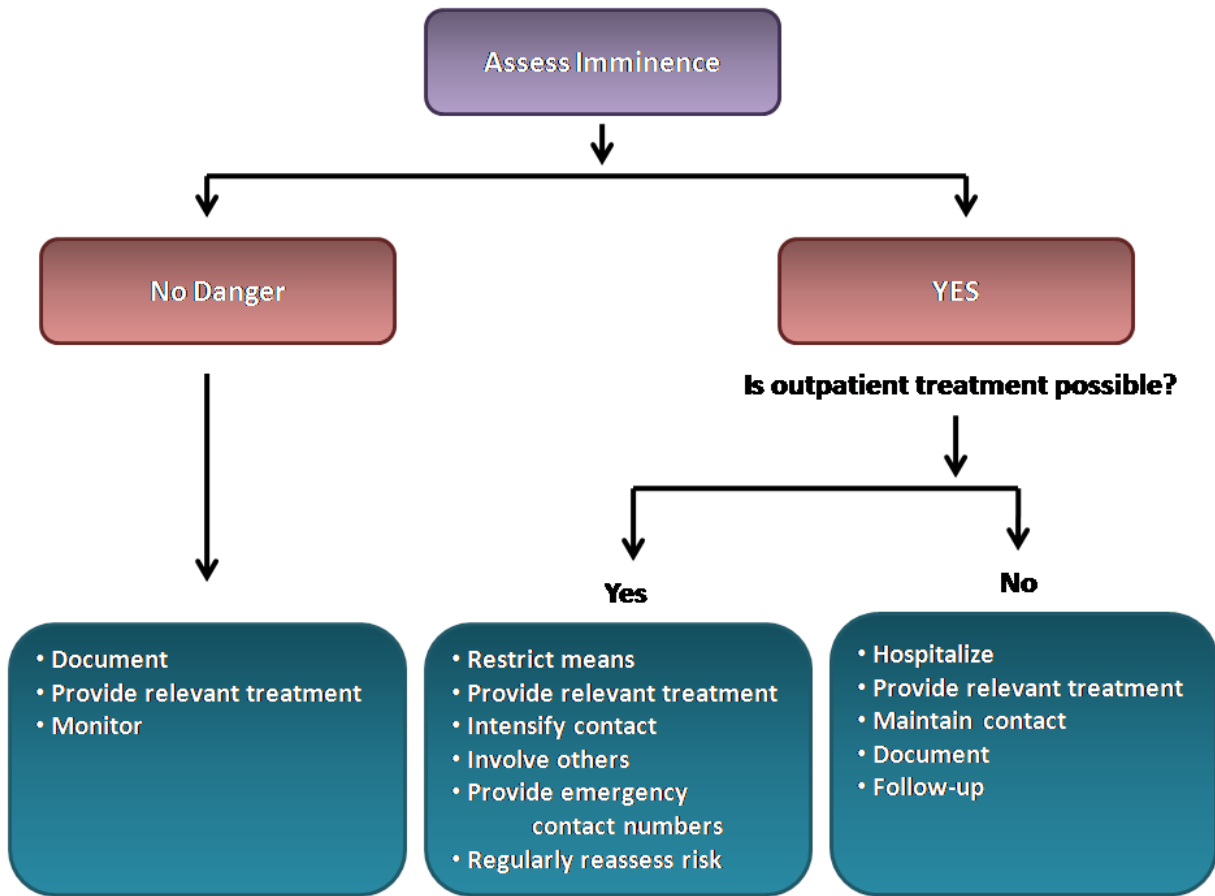
Outlines of initial management to ensure patient's safety

Table6. Factors determining the decision to hospitalize [3]

Strongly consider hospitalization under the following situations:
1.Prior attempt of high lethality 2. Well-thought-out plan
3. Access to lethal means 4. Uncommunicative 5. Recent major loss
6.Social isolation 7. Hopelessness 8. History of impulsive, high-risk behavior 9. Active substance abuse or dependence 10. Untreated mood, psychotic, or personality disorder
After a suicide attempt or aborted suicide attempt if:
1. Patient is psychotic 2. Attempt was violent, near-lethal, or

premeditated 3. Precautions were taken to avoid rescue or discovery 4. Persistent plan and/or intent is present 5. Distress is increased or patient regrets surviving 6. Patient is male, older than age 45 years, especially with new onset of psychiatric illness or suicidal thinking 7.Patient has limited family and/or social support 8. Current impulsive behavior, severe agitation, poor judgment, or refusal of help is evident 9. Patient has change in mental status with a metabolic, toxic, infectious, or other etiology requiring further workup in a structured setting

In the presence of suicidal ideation with:

1. Specific plan with high lethality 2. High suicidal intent

Table7. Factors favoring discharge from ER/ Outpatient management[3]

Release from emergency department with follow-up recommendations may be possible:

1. After a suicide attempt or in the presence of suicidal ideation/plan when: • Suicidality is a reaction to precipitating events (e.g., exam failure, relationship difficulties), particularly if the patient's view of situation has changed since coming to emergency department 2.Plan/method and intent have low lethality 3.Patient has stable and supportive living situation 4.Patient is able to cooperate with recommendations for follow-up, with treater contacted, if possible, if patient is currently in treatment

Outpatient management may be considered under the following situations:

1.No history of potentially lethal attempts 2. Lack of plan/intent; cooperative family member or other adults 3. Removal or lack of availability of lethal means 4. Communicative 5. Availability of intensive outpatient care 6. Good social support 7. Hopefulness 6. Patient has chronic suicidal ideation and/or self-injury without prior medically serious attempts, if a safe and supportive living situation is available and outpatient psychiatric care is ongoing

Emergency Non-Pharmacological measures

Safety Plan Intervention (SPI)- It is one of the most popular and well-recommended measures to deal with acute suicidal crisis. It is a brief cognitive intervention typically lasting 20 to 45 minutes which provides the suicidal patient with a specified and prioritized set of coping strategies and sources of support which may be used if suicidal thoughts emerge suddenly. A safety plan is best developed in collaboration with the patient. Assistance of family members/close contacts may be sought if required. A typical safety plan has the steps outlined in Table 8.

Table 8. Steps of A typical Safety Plan [11]

1. Identifying Warning signs of suicide- "Intense agitation and anxiety" "Severe mood fluctuations"
2. Internal Coping Strategies- Things that I can do to distract myself without contacting anyone-"Watching sports", "listening to music"
3. Socialization Strategies for distraction and support-Socializing with other people in their natural social environment (friends, neighbors) or visiting healthy social settings (library, coffee shop)
4. Social contacts for help in resolving the suicide crisis (close friends, family members)
5. Professional and agency contacts to help resolve a crisis (local hospital, Suicide Helpline)

Restricting the available means in the nearby environment (home, hostel)

No-Suicide Contract- This is a verbal or written agreement between the patient and the clinician which requests the patient from engaging in suicidal behavior in case of sudden crisis. Suicide contracts as effective methods of reducing suicide have limited evidence. Moreover, it is based on "subjective belief" and may lead to a false sense of security on the part of the clinician. Hence, it is not routinely recommended and should not be used in psychotic, agitated, impulsive, intoxicated and those with cognitive deficits. [3]

Activating Psychosocial Support-In consultation with the suicidal patient, psychosocial support may be activated by reaching out to family or friends and community resources, and provide details of community services including crisis lines. The main methods of activating psychosocial support are: a. Attending to existing relationships b. Building new relationships c. Modifying reactions toward others d. Utilizing family support

Psychotherapy- Cognitive behavior therapy-based interventions focused on suicide prevention have been found effective in patients with suicidal behavior. Dialectical Behavior Therapy, wherever available, should be offered to patients with Borderline Personality Disorder and history of recent self-directed violence. Problem-solving therapy has also been found to be effective in reducing suicidal behavior.[12]

Emergency Somatic Treatments-

1. Electroconvulsive Therapy (ECT)- ECT reduces suicidal behavior in the short-term. Its efficacy has been established in acutely suicidal patients, especially those suffering from unipolar depressive disorder.

2. Lithium- Lithium has established efficacy in reducing suicidality in patients with bipolar disorder and major depressive disorder. However, the immediate risk of overdosage with lithium in an actively suicidal patient has to be kept in mind. Steps like prescription of very short duration, supervised medications and keeping medicines under lock (wherever feasible) should be discussed.[13]

3. Antidepressants- Antidepressant treatment is generally recommended in treatment of suicidal behavior in cases with unipolar depression. The efficacy of fluoxetine and venlafaxine have been proved in reducing depression and suicidality in adult and geriatric population. There are concerns of antidepressant induced suicidality for which the treating team must psycho-educate the patient and the family members wherever applicable. Particular attention to this aspect must be paid during treatment for the first one month, especially among adolescents.

4. Ketamine- Studies have shown that ketamine is effective in rapidly reducing suicidal ideation, even with a single dose of 0.5 mg/kg. Ketamine is usually administered as an iv infusion. Though the Va/DOD Clinical Practice Guidelines [12] recommend

its use, the major issue concerning Ketamine is that the benefits have been found to be short -term and the trials have been carried out on small patient groups. Hence, the use of ketamine infusion in suicidal behavior still remains off-label.[14] Ketamine is a controlled substance which is used as an intravenous or intramuscular injection solution for induction and maintenance of general anesthesia. Ketamine needs to be used with caution due to associated side effects related to hemodynamic stability, emergent reactions like vivid dreams, hallucinations, respiratory depression and drug-induced liver injury among others. The intranasal preparation, Esketamine, has been approved by the Food and Drug Administration (FDA) in August, 2020 to "treat depressive symptoms in adults with major depressive disorder with acute suicidal ideation and behavior". Potential risks associated with Esketamine include sedation, dissociation, and abuse or misuse and in the US its use is subject to strict safety controls on dispensing and administration. It has to be dispensed and administered only in certified health care settings and patients must be monitored inside the healthcare setting after administration for a minimum of two hours until patients are safe to leave.

5. Clozapine – Clozapine has been found to reduce suicides and suicide attempts in patients with schizophrenia and may be considered in this group of patients

6. Measures to control acute anxiety and agitation- These measures are often indicated in controlling severe agitation and anxiety in actively suicidal patients and can be useful in the immediate management. Injectable antipsychotics and benzodiazepines may be used for this purpose in the emergency treatment setting. Benzodiazepines are sometimes used for treating severe anxiety associated with suicidality. We lack adequate evidence to support this recommendation. Moreover, benzodiazepines can frequently be used as means of suicide and can also cause

disinhibition in some patients. However, these drugs may be effective in treating severe insomnia associated with suicidality. [14]

Long term Management of Suicidal Behavior

Brief Interventions and follow-up-
The World Health Organization (WHO) Brief Intervention and Contact (BIC) treatment modality consists of "a one hour individual information session as close to the time of discharge as possible and, after discharge, nine follow-up contacts (phone calls or visits, as appropriate) according to a specific time-line up to 18 months (at 1, 2, 4, 7 and 11 week(s), and 4, 6, 12 and 18 months), conducted by a person with clinical experience (e.g., doctor, nurse, psychologist).The information relates to psychological and social distress that often underlies suicidal behavior, risk and protective factors for suicidal behaviors, basic community-specific epidemiology of suicide, repetition of suicidal behaviors, alternatives for constructive instead of self-destructive coping strategies, and contacts/referral options. WHO BIC has been found to significantly decrease suicides among patients with a history of suicide attempt in low- to middle-income countries (e.g., China, Iran, India, Brazil, Sri Lanka).[15] This could be an effective model of post-discharge aftercare in individuals admitted for suicidal behavior in addition to the usual treatment modality. [12]

Management of Chronic Suicidal Behavior- Individuals with high chronic risk are those individuals having chronic disabling medical/psychiatric condition with chronic suicidal ideation. They are at a high risk of becoming suicidal in the event of sudden unexpected crisis. Apart from treatment of the chronic condition,

these individuals should have a properly designed Safety Plan in place and undergo regular risk assessments on follow-up visits. Individuals with moderate chronic risk have a similar profile except for a stronger support system and coping reserves. They should be managed on similar lines. [3]

Medicolegal Aspects of Suicide

According to Section 309, Indian Penal Code, whoever attempts to commit suicide and does any act towards commission of such an offence, shall be punished with simple imprisonment for a term which may extend to one year (or with fine, or with both). This has been criticized as a regressive legislation. Attempt to die by suicide is discussed in Section 115 of MHCA 2017. Part 1 of the section states that "Notwithstanding anything contained in Section 309 of the IPC, any person who attempts to die by suicide shall be presumed, unless proved otherwise, to have severe stress and shall not be tried and punished under the said Code." It has an "overriding" effect on Section 309, IPC. Part 2 of the section states that the appropriate government shall have the duty to provide care, treatment and rehabilitation to a person who has attempted suicide. Thus, following implementation of MHCA, Section 309 IPC has become redundant in that people who attempt suicide can't be punished. However, the reporting may need to be done as per local state government rules.

REFERENCES

1. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders 5th Edition. DSM 5. American Psychiatric Association, Arlington,VA,2013

2. Silverman MM, Berman AL, Sanddal ND, O'carroll PW, Joiner TE. Rebuilding the tower of Babel: a revised nomenclature for the study of suicide and suicidal behaviors. Part 2: Suicide-related ideations, communications, and behaviors. Suicide Life Threat Behav 2007;37(3):264–77.

3. Jacobs, DG, Baldessarini, RS, Conwell, Y, et al. 2003, Practice guideline for the assessment and treatment of patients with suicidal behaviors. American Psychiatric Association

4. WHO (2020). Global Health Estimates 2019: deaths by cause, age, sex, by country and by region, 2000–2019.

5. National Crime Record Bureau. Accidental deaths and suicide in India. New Delhi: Government of India; 2020.

6. Rudd, MD, Berman, AL, Joiner, TE Jr, Nock, MK, Silverman, MM, Mandrusiak, M, Van Orden, K and Witte, T 2006, Warning signs for suicide: Theory, research, and clinical applications. Suicide Life Threat Behav, 36, 255–262.

7. Substance Abuse and Mental Health Services Administration. SuicideAssessment Five-step Evaluation and Triage for clinicians (SAFE-T). Available at: https://store.samhsa.gov/product/SAFE-T-Pocket-Card-Suicide-Assessment-Five-Step-Evaluation-and-Triage-for-Clinicians/sma09-4432

8. Framework for Suicide Risk Assessment and Management for NSW Health Staff. Available at: NSW Health website: www.health.nsw.gov.au

9. Buzan, RD and Weissberg, MP 1992, Suicide: Risk factors and therapeutic considerations in the emergency department. J Emerg Med, 10, 335–343.

10. Vijayakumar L, Vijayakumar V. Emergency management of suicidal behavior. In: Emergencies in Psychiatry in Low and Middle Income Countries. [Eds.] Thara R and Vijayakumar L., Routledge

11. Stanley B, Brown GK. Safety Planning Intervention: A Brief Intervention to Mitigate Suicide Risk. Cognitive and Behavioral Practice. 19; 256-264

12. Department of Veteran Affairs, Department of Defence. VA/DODClinical practice guideline for the assessment and management of patients at risk for suicide (2019). Available at: https://www.healthquality.va.gov/guidelines/mh/srb/

13. SchafferA, Isometsä ET, Tondo L, Moreno DH, Sinyor M, Kessing LV, et al. Epidemiology, neurobiology and pharmacological interventions related to suicide deaths and suicide attempts in bipolar disorder: Part I of a report of the International Society for Bipolar Disorders Task Force on Suicide in Bipolar Disorder. Aust N Z J Psychiatry. 2015 September ; 49: 785–802

14. Baldacara L, Grudtner RR, Leite VS, Porto DM, Robis KP, Fidalgo TM, et al. Brazilian Psychiatric Association guidelines for the management of suicidal behavior. Part 2. Screening, intervention, and prevention. Braz J Psychiatry. 2020;00:000- 000. http://dx.doi.org/10.1590/1516-4446-2020-1108

15. Vijayakumar L, Umamaheswari C, Shujaath Ali ZS, Devaraj P, Kesavan K. Intervention for suicide attempters: A randomized controlled study. *Indian J Psychiatry*. 2011;53(3):244-248. doi:10.4103/0019-5545.86817

Clinical Practice Guidelines for assessment and management of aggressive and assaultive behaviour

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INTRODUCTION-

Occurrence of Violence and aggression in mental health facilities is common, sometime with serious consequences [1] warrant the formation of a guideline that addresses these issues. Combination of extrinsic and intrinsic factors along with context and setting of violence makes the task of its prevention and management a complex phenomenon. The intrinsic components are mainly consisted of personality features, current serious mental stress and difficulty in managing anger. On the other hand extrinsic factors are more diverse and depends not only upon physical and social context where violence and aggression happens but also on aggressor's attitude, victim's characteristics, health professional's training and experience and perceived risk of danger. [2]

DEFINITIONS OF VIOLENCE AND AGGRESSION

Violence and aggression can be defined as a set of activities that may lead to harm to other persons. It can be either behaviorally or verbally expressed, but the physical harm is maintained and the purpose is clear. [2]

EPIDEMIOLOGY

Aggression by patients in psychiatric wards may be a common occurrence . Of inpatients, 18% to 25% of show violent behavior whereas within the ward as per the different researches. [3]High occurrence of aggression particularly verbal aggression is also reported by Emergency staff. [4]

The association of Mental conditions with Violence and Aggression
It has long been recognized by public that mental health problems (particularly the serious mental issues such as bipolar affective disorders and schizophrenia) and violence are related, but the literature about this fact shows mixed results.
The person with mental health issues is more likely to be a victim rather than perpetuator of violence and most of them don't commit violence at all. [5]. However, a consensus has emerged among researchers that a small fraction of patients have relation between mental health issues and violence.

Persons with organic brain dysfunction (post traumatic, post head injury, seizure disorder particularly temporal lobe seizures tend to exhibit violent and aggressive behaviour.

The Epidemiological Catchment area study [6] reported a7.3% of lifetime prevalence of violence within the population who is free from psychiatric issues .On the other hand the lifetime prevalence of violence was more than double (16.1%) in persons with schizophrenia or Major affective disorders and 35% and 43.6 % in those with substance use disorders and substance use disorder with co-morbid mental health issues, respectively.

An association of violence was noticed, in different meta-analyses with Mood disorders, schizophrenia and other psychosis. [7-9] A huge varieties were recognized with odds ratio between 1 and 7 for schizophrenia in males and between 4 and 27 for females. For bipolar disorder the odds ratio extended from 2 to 9. Be that as it may, for both disorders a co-morbid substance-use disorder expanded odds ratio up to 3-fold.

In the early 20th century, researchers recognised a set of symptoms called threat/control-override symptoms, which appeared to be connected to the risk of violence. [10] Threat/control-override symptoms are delusional manifestations that make individual feel like that he is under threat and under control of external forces.

Personal consequences of violence and aggression for the Person and others

Staff within the hospital

A fraction of the injuries that happen to staff occur while trying to intervene fights between patients, but staff may also receive injuries by unpredictable assaults made by patients who respond to their psychiatric symptoms or by confrontation while stopping patients from leaving the ward. [11]Sometime staff also have to physically intercede to halt patients harming themselves or attempting to take off the ward which may lead to aggression

Individual consequences

Patients who carry on violence are likely to encounter more accommodation difficulties, diminished social relations, social support and be more disconnected.
Violence is subsequently risky for the individual concerned and is likely to negatively affect their quality of life.

Relatives, carers and social networks

Family members , carers and close contacts of patients are more likely to be injured when there is a risk of violence exists. On the other hand, in case the patient is living freely, relatives may pull back, stop supporting and visiting him if they frequently face aggressive and abusive behaviour .

In hospitals, staff attributes   person's sickness as the cause of hostility, whereas patients see illness, interpersonal issues and environment as equally responsible for their aggression. [12]
Such perception of staff is important in understanding how they will react to the incident and their need for post incident support in order for them to deal effectively with the consequences for themselves and patients [13].

Demographic and Pre-morbid factors

Histories of aggression, schizophrenia, recent drug use are associated with aggression while inconclusive evidences for Age, Gender and h/o conduct disorder.

Table :1 - Causes of Aggressive and Violent Behaviour	
Medical causes	**Psychiatric causes**
Hypoxia, hypercarbia, Lung diseases	Acute schizophrenic excitement
Disturbed blood glucose levels	Bipolar Disorder- Acute Mania,
Malnutrition	Depression-suicidal behaviour
Drug effects and withdrawals – amphetamine, steroids, alcohol, prescribed medications and interactions,	Substance abuse disorder (Acute intoxication/withdrawal syndrome) Alcohol/opium/opiates/cannabis and other substances
Cerebral conditions as – stroke, seizure, infections, space occupying lesions and trauma	Acute situational reaction/ATPD
Infections – systemic sepsis, urine tract infection in the elderly	Survivors of sexual assault
Metabolic and electrolytic disturbances	Borderline/Antisocial personality disorder/conduct disorder
organ failure – liver or renal failure	

RISK FACTORS FOR AGGRESSION AND VIOLANCE

Risk factors are characteristics of patients or their environment and care that reflects increased chances of that person behaving aggressively.

Two types of risk factors.

1.   Static risk factors –
      Historical and remain unchanged
      Example - Age, sex, family background, and childhood abuse. [14]

2.   Dynamic risk factors–
      Are changeable and thence there is an opportunity for intervention.

Example- presenting symptoms, alcohol and illicit substance consumption and compliance issue with treatment. [14]

Assessment of risk includes the recognition of risk factors and an estimation of the probability and nature of a negative result. On the other hand, risk management involves methodologies to prevent these negative results from happening or to limit their affect.

A few researchers believed that static factors may be better for long-term and dynamic factors for short term evaluation of violence risk. [14]

VIOLENCE ANDAGGRESSION RISK ASSESSMENT AND PREDICTION

Prediction relates to the event that is felt to be imminent or about to occur in short time but in acute clinical scenarios it is difficult to perform comprehensive assessments that comprises of history , physical and mental status examination in patients with risk of violence and agression.

Table:2- Broadly there are three methods to assess risk		
Unstructured clinical assessments	**Actuarial risk assessment**	**Structured clinical judgements**
• Past history of Violence and Aggression • The affect of mental and physical health issues • Personality and Substance use-disorders • Social and cultural components. [2]	• Utilize quantifiable predictors based on research; in order to estimate a quantifiable value for the outcome in question. • The outcome in question would be the likelihood of violence or aggression happening within the short-term. [2]	• This is a combination of the clinical appraisal approach and the actuarial approach. • Risk factors determined from a wide review literature are evaluated by the assessor utilizing numerous sources of clinical information. [2]

Table:3- Various violence-related risk assessment tools	
Broset Violence Checklist (BVC) [15]	• It is a six item pen and paper based scale with score ranges from '0-6' • Each of the six items is scored for their presence (1) or absence (0) • Cutoff is equal to or greater than 2 • It assesses: Threats- physical or verbal, irritability, confusion, vociferous behaviour and attack on an object.
Classification of Violence Risk (COVR) [16]	• Interactive software program • Estimate the risk of violence by a hospitalized psychiatric patient towards other persons. • The software generates a report that show patient's violence risk-ranging from a 1% to 76% likelihood of violence-, with enumeration of risk factors that the program took into consideration for the risk estimation
Dynamic Appraisal of Situational Aggression (DASA) [17]	• It is a seven item pen and paper based scale with score ranges from '0-7' • Cutoff is equal to or greater than 2 • Behaviour assessed: sensitivity to perceived provocation, anger on denial of request, irritability, impulsive behaviour, negative attitudes and verbal threat, reluctancy to follow directions.
Historical Clinical and Risk Management – 20 items (HCR-20) [18]	• Twenty items include 10 historical factors, 5 dynamic clinical factors, and 5 dynamic risk management factors. • Scored on a 3-point scale (0–2), with higher scores reflecting the presence of a risk factor.

Modified overt aggression scale (MOAS) [19]	• It measures verbal and physical aggression in persons with Intellectual disability who reside in community settings • It is suitable in evaluating the effectiveness of interventions directed towards controlling aggressive challenging behaviour in this group.
Nursing Observed Illness Intensity Scale (NOIIS) [20]	• It provide a more objective measure of behavioural improvement and symptom reduction. • It is completed by accomplished duty nurses at the end of every shift, based on observation and interaction with patients, • It also can be used to track progress, response to treatment changes and fitness of the patient for discharge; . The scale can be used in clinical trials of treatment outcomes.
Psychopathy Checklist revised – (PCL-R) [21]	• The PCL was designed to use it in criminals • It has 20 items , each scored on a 3-point ordinal scale (0-2) based on the Information obtained from offender's institutional file. • The interview was designed to get the offender's interpersonal style , education, occupations, family life, marital status, present and past offenses, drug and alcohol use, and health problems.
Short-Term Assessment of Risk and Treatability (START) [22]	• 20 item instrument • Scoring ranges from '0-2'(0 =no relevant strengths/vulnerabilities; 1 = some relevant strengths/vulnerabilities; and 2 = definite strengths/vulnerabilities. • Assess dynamic risk factors for seven adverse outcomes: violence, self-harm, suicide, substance misuse, victimization, self-neglect and unauthorized leave. • No 'cut-off' scores are provided.

The Violence Risk Appraisal Guide-Revised (VRAG-R) [23]	• It is a actuarial risk assessment instrument that contain 12-item • It is appropriate for males who are 18 years old or more and have committed serious, violent or sexual offences• • The instrument scores on the basis of clinical records rather than interviews and provides a numerical risk estimate.

Various places where violence risk may be present

Including larger and smaller hospitals, institutes ,nursing homes , long-term care facilities , residential/nonresidential Treatment settings,small clinics and community care setting

Field work settings- health care or social workers who sometime need to make home visits..

Use safety measures in all settings to prevent violence and aggression.[24]

MANAGEMENT OF AGGRESSION AND VIOLENCE

Management of aggressive and violent behavior will depend upon the sensorium and orientation of patient at the time of presentation. If the patient is disoriented /delirious then the management would be as per the guidelines of a delirious patient [25]. If he/she is well oriented and has clear sensorium then management will be as follows.

1. Verbal de-escalation

2. Restrictive interventions

3. Pharmacological management

1. VERBAL DE-ESCALATION

Table-4 verbal de-escalation		
Three step approach	**Domains of De-Escalation -**	**Descalation in emergency setting**
• The patient is verbally engaged; • A collaborative relationship is established; • The patient is verbally de-escalated out of the agitated state. [26]	• Respect personalspace • Do not be provocative • Establish verbal contact • Be concise • Identify wants and feelings • Listen closely to what the patient is saying • Agree or agree to disagree • Lay down the law and set clear limits • Offer choices and optimism • Debrief the patient and staff [26]	• Physical Space Should Be Designed for Safety • Staff Should Be Appropriate and trained for the Job • Use Objective Scales to Assess Agitation • Clinicians Should Self-Monitor and Feel Safe When Approaching the Patient [26]

2. RESTRICTIVE INTERVENTION

• Modifications according to the environment

• Personal and institutional alarms to be fixed in easily accessible site

Common restrictive interventions include

A.   Physical restraint

As per section 97 of Mental Health Care Act 2017 physical restraint should only be used when there is imminent and immediate harm to person concerned or to others and it should be authorized by psychiatrist in charge.

Salient points to be considered as per mental health act 2017 for physical restraint

- Physical restraint should not be used longer than necessary

- Treating psychiatrist or medical officer should be responsible for ensuring the method and nature of restraint, its justification and appropriate record.

- Nominated representative should be informed if restraint prolonged beyond 24 hours.

- It should not be used as a punishment method or counter for staff shortage.

- Person should be placed under restraint at a place where he can cause no harm to him or others, and be under regular supervision by medical personal.

- All instances should be reported to mental health board on monthly basis.

For further reference reader can use specific restraint guideline for mental health services in India by Raveesh et al. [27]

Techniques used for Physical restraint.

1. In a bed with tied both arms, both legs, and a hip belt, The patient should be observed constantly during mechanical restraint. In the event that this was not conceivable, patients had to be observed at slightest for 15 minutes of each hour of restraint and by sight check each 10 to 15 minutes for the leftover portion of each hour. [2]

Or

2. Portrayed as 'strong cotton groups to both arms and both legs and joined to the bedside to permit a few confined movement within the prone position . [2]

Physical restraint techniques should be modified according to the patient's condition for example if he or she is intoxicated or under withdrawal, heavy drinker, having serious injury, physical or medical illnesses, including disabilities, pregnant or obese [2]

B.   Seclusion

Seclusion is not permitted in India as per existing Mental Health Care Act 2017. However, in western guidelines seclusion is reported as one of the techniques.

Is an 'involuntary imprisonment of a individual in a room from which the individual is physically avoided from moving out... patients were watched each 10 to 15 minutes through a window within the door. [2]

One RCT [28], reported a low level of evidence that suggest a minimal restrictive care (seclusion) is as effective as a more prohibitive pathway (mechanical restraint)

Three reviews [29-31] reported that though staff believes restrictive measures to be a necessary step, this was also associated with feeling of regret, trauma and concern about therapeutic relationship.

Advisable Laboratory Investigations

As soon as the patient is cooperative or sedated by pharmacological management, following investigations may be done

- Complete Blood Count

- Liver Function Test

- Renal Function Test

- Random Blood Sugar

- Electro-cardiogram (ECG)

- Electrolytes

- Urinary drug screening

- Brain scan (optional , after clinical judgment)

3.   PHARMACOLOGICAL MANAGEMENT

Every individual with aggressive and assaultive behaviour presented with a different set of issues. There is a lack of good scientific literature in an area of medical management in acute setting for aggressive and assaultive behaviour. Pharmacological management of the aggressive and assaultive behaviour should be considered only when other method of management failed or respond

inadequately.[32] Selection of pharmacological treatment for aggressive and assaultive agitation should be based on underlying etiological issues and psychiatric diagnosis.

Psychiatric reasons for presentation of acute aggressive behavior are due to psychotic illness like schizophrenia, bipolar disorder, schizoaffective disorder, delusional disorder, substance related issues, conduct disorder, intermittent explosive disorder and personality problems. Certain patient related and medication related factors should be kept in mind before planning effective management plan.[33]

| **Table:5 - Factors to be consider in pharmacological management of Aggressive and Assaultive behaviour**[33,34] |
|---|
| *Patient related factors* |
| • **Age :**Appropiate consideration to be given in case of old age and children |
| • **Sex:** Gender related issues in side effect profile should be kept in mind. |
| • **Co-morbid medical disorder:** Liver and Renal function statusshould be assessed |
| • **Co-morbid psychiatric disorder:** Patient should offer dose optimization in ongoing Medication |
| • **Substance use disorder:** drug interactions with substance use and consideration for over sedation |
| • **Collateral history:** Input about physical health and current and past difficulties |
| • **Patient preference and past response:** help to guide about potential effects and side effects |
| • **Physical health of the patient and current vital parameters:** help in selecting medication base on current risks and benefits |
| *Medication related factors* |
| • **Concurrent medication :** risk of over sedation should be kept in mind |
| • **Drug interaction:** particularly vigilant when combination of medication use. |
| • **Side effects:** Respiratory Depression and Cardiac conduction problem is major life threatening problems always kept in mind. |

A mainstay for pharmacological treatment aggressive and assaultive behaviour lies within rapid tranquillisation in the short term. Search for psychopathology and/or medical reasons and appropriate management of it should be a next step of action.[35]

Presentation of such assaultive and aggressive behaviour is also varied in a different setting like community, acute and emergency department, psychiatric inpatient setting or medical setting. Definition of Rapid tranquillisation is subjected to debate. The major goal of treatment is to archive the calmness without over-sedation of the patient as well as rapid control of acutely disturbed behaviour.[35,36] However, in case of acute behavioural disturbance level of sedation required in

much deeper extent. Recent NICE guideline defines rapid tranquillisation specific to parental route, particularly by intramuscular and in the rare case intravenous route. Although this guideline also highlight use of oral preparations before parental.[35]

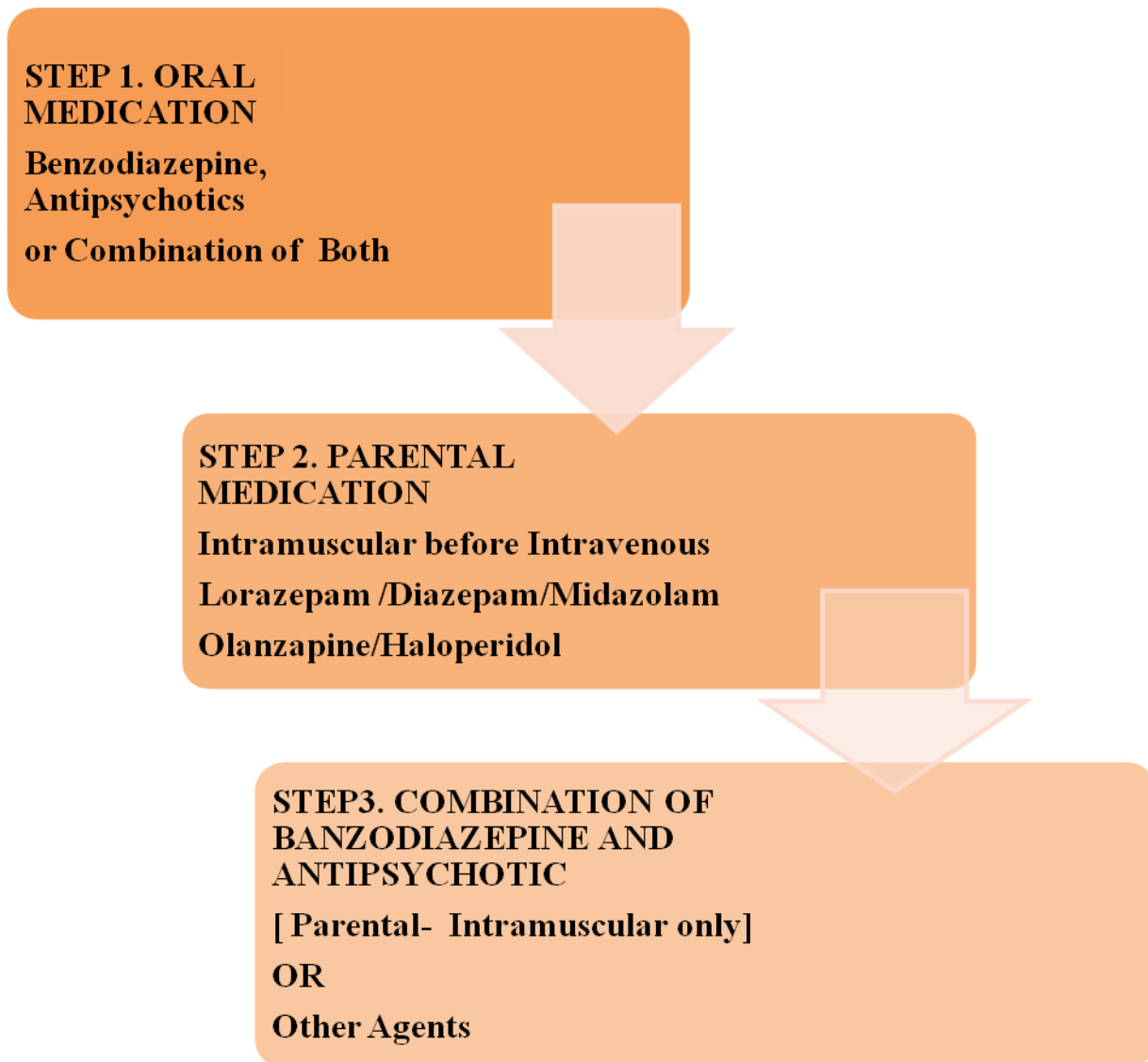| Table:6 -Principles of pharmacological management ofAggressive and Assaultive behaviour |
| --- |
| ▪ Individual management plan for patient. |
| ▪ Reduce suffering of the patient. |
| ▪ Providing a safe environment for others. |
| ▪ Produce calming effects, but avoid over- sedation. |
| ▪ Acute control of behavior and reduces risk of involve stakeholders. |
| ▪ Pharmacological management should be last options |
| ▪ Avoid combination of medicine and high cumulative dose. |
| ▪ Consideration should be given to patient physical health before considering treatment options. |

Figure:1- Outline of pharmacological managment of Aggressive and Assaultive behaviour
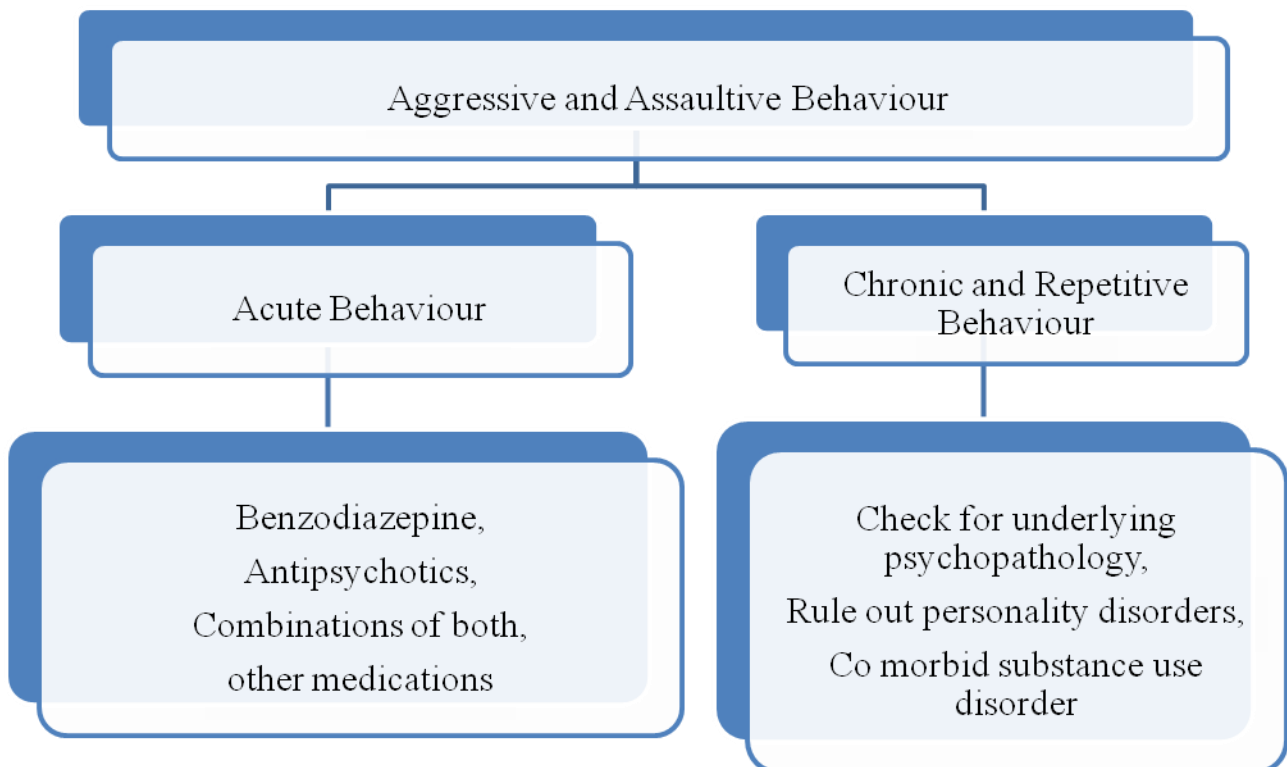
Management of Acute Aggressive and Assaultive Behaviour

No agent preferred over the other. Use of medication is based on various factors as mention in the table 5. Use of oral medication must be encouraged before any form of parental medicine. But it may depend on the severity of acute presentation, availability of resources, and patient co-operation. Also single medication use should be always preferred over a combination of the medicines. A combination of more than one agent leads to develop unnecessary side effects and negative patient experience. Patient age, hepatic and renal function also consider before prescribing any agent.

Stepwise approach should be considered as shown in following path for acute management of aggressive and assaultive behaviour.[35]

STEP 1. ORAL MEDICATION

Benzodiazepine, Antipsychotics

or Combination of Both

STEP 2. PARENTAL MEDICATION

Intramuscular before Intravenous

Lorazepam /Diazepam/Midazolam

Olanzapine/Haloperidol

STEP3. COMBINATION OF BANZODIAZEPINE AND ANTIPSYCHOTIC

[Parental- Intramuscular only]

OR

Other Agents

Oral and Inhaled Treatment

Research supported the early use of oral medication due to good efficacy of medications in controlling assaultive and violent behaviour. Patient with mild to moderate level of agitation may show cooperation in taking oral medication. Benzodiazepine and Antipsychotics were primarily used for the management of violent and assaultive behaviour.[35,37]

Benzodiazepine acts through GABA receptor and it has, anxiolytic, hypnotics and anticonvulsant properties.[33] Oral benzodiazepine available in various formulations like melt –in mouth, oral disintegrated molecule, buccal preparations. Oral Lorazepam , diazepam and midazolam used extensively in the past for controlling violent behaviour.Oral benzodiazepine is relatively safe and less associated with respiratory depression compare to its parental preparations.

Both first and second generation antipsychotics were used due to their brain calming effect. Oral mouth dissolving preparations of Olanzapine, Risperidone(both mouth dissolving and solution base prepration), Haloperidol and Qutiapine have been used for a long time.[a] Sublingual Asenapine also shown it effectiveness in managing acute behavioural changes.[33] Recently FDA approved inhaled form of loxapine for management of acute violent behaviour associated with schizophrenia and bipolar.[38] But availability of bronchodilatior medication should be ensure due its serious adverse effect of bronchospasm. Commonly use medication and their adverse reaction given in the table no 8.

Parenteral Treatment

Intramuscular preparations of Olanzapine, Haloperidol, Aripiprazole , Lorazepam, diazepam have been used since long. Research has not shown the parental route has any advantage over oral route in treatment efficacy but onset of action is rapid with parental route.Large observational study shows IM Olanzapine is more effective than all other second generation antipsychotics.

Table:7- Summary of studies withdifferent medication combinations and their outcome[39-43]	
Comparison Arms	**Outcome**
IM Midazolam 7.5-15mg v/s IM Haloperidol 5-10mg + Promethazine 50 mg	Midazolam was more sedating [TREC 1]
IM Lorazepam v/s IM Haloperidol 10mg + Promethazine25- 50 mg	Combination was more effective [TRAC 2]
IM Haloperidol 5-10mg v/s IM Haloperidol 5-10mg + Promethazine 50 mg	Combination was more effective and tolerable [TRAC 3]
IM Olanzapine 10mg v/s IM Haloperidol 10mg + Promethazine25- 50 mg	Olanzapine was as effective as other arm in short term. But effect did not last for longer time. [TRAC 4]

The Combination of midazolam IM with IM haloperidol is more effective than IM haloperidol alone. NICE recommend intramuscular Lorazepam should always try before haloperidol in case of

insufficient information to guide choice of medication.[35] A partial response to intramuscular Lorazepam NICE recommend a repeat dose of Lorazepam. But in case of partial response of intramuscular haloperidol addition of intramuscular promethazine should be tried.[35] Avoid use of a combination of Olanzapine intramuscular preparation with intramuscular benzodiazepine in case of alcohol use.[39] ECG must be carried out before haloperidol because of risk of QT prolongation.[35,39] The Intravenous route is no longer advice as an initial choice for rapid tranquillization.[35,39]

Intravenous Midazolam is more closely associated with respiratory depression. Flumazenil should have been kept handy whenever the intravenous injection of benzodiazepine is given.[39] Below table shows various options for rapid tranquillisation and their dosage and route of administration.

Table:8- Various medication options available for rapid tranquilization, their dosage and maximum dose in 24hours and waiting interval [33,37,39]					
Route of administration	Drugs Dosage	Onset of action	Max dose in 24 hours	Waiting interval	Special point
Oral	Lorazepam 1-2mg	20-30 min	12mg	2hour	Overseddation, Amnesia , Respiratory depression, Paradoxical reaction
	Risperidone 1-2mg	1 hour	6mg	1hour	EPS, Hypotension
	Olanzapine 5-10mg	2-6 hour	20mg	2-4hour	Hypotension, Over-sedation
	Haloperidol 5 mg	30-60 min	20mg	6hour	EPS, Hypotension QT prolongation
Parenteral - Intramuscular	Lorazepam 2-4mg	15-20 min	4mg	1hour	Overseddation, Amnesia , Respiratory depression, Paradoxical reaction
	Olanzapine 2.5-10mg	15-45 min	-	-	EPS, Hypotension, over sedation
	Promethazine 25-50	30min	100mg	30min	Excessive sedation
	Haloperidol 2.5-10	30min	30mg	30min	EPS, Hypotension QT prolongation
	Loazepam and haloperidol 2mg+ 5mg	30min	15mg/4mg	1hour	Oversedation ,EPS, Hypotension QT prolongation

	Haloperidol and promethazine 5mg+ 25 mg	30min	30mg/ 100mg	30min	Hypotension, oversedation, EPS
Intravascular	Lorazepam 1-4mg	1-5min	10mg	15min	Overseddation, Amnesia , Respiratory depression, Paradoxical reaction
	Midazolam 2.5-10mg	5min	-	10-15min	hypotension, Amnesia , Respiratory depression, Paradoxical reaction
	Diazepam 10 mg	1-5min	40mg	30min	Overseddation, Amnesia , Respiratory depression, Paradoxical reaction
	Anesthetic agents. Ketamine				Should be given under strict medical intensive setup

Table:9 - Table shows various psychological condition and medication to be considered[32,38]

Psychological and Medical conditions	Medication to be considered
Mood Disorder	Antipsychotics preferred over Benzodiazepine
Schizophrenia and Delusional Disorder	Antipsychotics preferred over Benzodiazepine
Post traumatic Stress Disorder	Benzodiazepine
Substance Abuse Disorder- CNS depressant	Antipsychotics preferred over Benzodiazepine
CNS stimulant and alcohol withdrawal	Benzodiazepine
Delirium (Non alcohol withdrawal)	Treat underlying cause and antipsychotic only if necessary
Delirium (alcohol withdrawal)	Benzodiazepine
Pregnancy	Antipsychotics
Dementia- BPSD	Low dose antipsychotic only if necessary considering risk and benefits

Table:10- Consideration in case of Special populations [33,35,39]	
Children and Adolescents	• Start with lowest possible dose • Adjust dose according to age and weight • Parental Lorazepam preferred over antipsychotics • Use of benzodiazepine associated with paradoxical reaction and dis-inhibition • More to prone side effect of antipsychotics • Monitor Physical Health and Emotion of young person • NICE – Recommends only intramuscular Lorazepam
Older Adults	• Start with lowest possible dose • Use of benzodiazepine associated with paradoxical reaction and dis-inhibition • More prone to side effects
Physical Restrain	• Prepared for complication • Risk assessment • Observe with in eyesight
Substance Misuse	• No agent superior to other • Consideration of IM Lorazepam • Avoid Lorazepam in case of alcohol intoxication

Monitoring in case of Rapid Tranquillization

Monitoring of sedation with appropriate tools and rating scales like Ramsay scale, Richmond Agitation Sedation scale, Sedation Assessment Tool should be carried out and post sedation documentation about the incident and tried to find out cause for such behaviour is also an important part in the management of patients.[35]If possible, provide one to one nursing and the eye sight observation for better management of the condition. Continuous monitoring of vital sign as mention follows.

Table:11- Physical Health monitoring in case ofRapid Tranquillization	
Physical and Clinical parameters	**Interval**
• Pulse • Blood pressure	Every 2 hours
• Temperature	Every 6 hours
• Respiratory rate	Constant
• Oxygen saturation	Every 30 minutes
• Clinical examination and check for over-sedation	Before every dose

Frequent monitoring of vitals at every 15-20 min should be ideally carried out for high risk patients.[35] One should also need to be watchful for acute side effects of antipsychotic medicines- like Acute Dystonia, Neuroleptic Malignant Syndrome, Acute Confusional State, Hypotension, Irregular Heart rates and also Respiratory Depression due to benzodiazepine. [39,44] Also staff should be trained in providing basic life saving resuscitation and use of flumazenil in case of severe respiratory depression. Further investigations are required before giving repeating dosage of medications and rule-out medical causes and medical co-morbidities. If the patient is calm and co-operative for mental status examination, then attempt should be made for the same.

Uncooperative Violent and aggressive patient at home

For emergency, medical treatment for mental illness may be provided by a registered medical practioner to a person with mental illness either at a health establishment or in community with informed consent of a nominated representative.Nominated representative should be available at the time of evaluation. Emergency is to be considered and needs immediate intervention to prevent–

- Death or irreversible harm to health of person.

- Person inflicting serious harm to himself or to others

- Person causing serious damage to property belonging to himself or to other where such behavior is believed to flow directly from the person's mental illness

For the purpose of treatment, only the situations mentioned above can be considered.

Emergency treatment duration is to be considered upto 72 hours from the initial evaluation by a registered medical practioner/Psychiatrist.

Emergency treatment includes transportation of person with mental illness to nearest mental health care establishment for assessment and management

If management at home is not possible or unaffordable relatives or care givers of such patients should approach the nearest police station for escorting him/her to nearest psychiatric care facility for management.

Management of chronic aggressive and assaultive behaviour

Some case, aggressive and assaultive behaviour may persist for the longer duration. The use of specific medication should be required for control of future behaviour. Use of particular medication is based on consideration of clinical features and mechanism of action of the medication. Since no medication has been approved for this specific indication.[45]

The Clinician must have to consider other groups of medication apart from antipsychotics and benzodiazepine (i.e. mood stabilizing anti –epileptics, antidepressants).

The Clinician should also try to diagnose underlying psychopathology in depth and also consider about substance misuse and personality related problems in the case of chronic aggressive behaviour. Prolong use of antipsychotic in elderly population should be considered against the risks and benefits. [45]

Victims of workplace violence subsequently may develop psychological trauma, work avoidance, guilt feeling, powerlessness, changes in relationships.

A follow up programme for adressing these above mentioned response may be needed that includecounselling,Critical incident stress debriefing, Employee assistance programme, Support groups. [24]

Safety and Health Training

All staff members should be trained on deescalation techniques.Training can improve knowledge about hazards and safety measures

Patient, Client and Setting-Related Risk Factors include

Working directly and alone with a person having history of violence, substance abuse, gang membership, possession of arms.

Faulty design of working place that may impede safe escape

Deficit in means of emergency communication.

Transporting patients;
Working in criminal neighborhood . [24]

Organizational Risk Factors

Poor staff training and policies , understaffing, inadequate security, overcrowded patients and unrestricted movement in hospital are the organizational risk factors**.** [24]

.

Training of Health workers to reduce risk and violence
The topics for training may include policy for violence prevention and documentation, possible risk factors, warning signs, diffusing anger and methods of dealing with hostile patients, safety devices and safe rooms, a response action plan, self and staff defense,. [24]
Appropriate training of supervisors to recognize the dangerous situations so that they can avoid putting staff in such risky situations

Risk factors for workplace violence
These are the factors that may suggest possible risk of harm

	Yes	No	Notes/Follow-up Action
Do employees have contact with the public?			
Do they exchange money with the public?			

Do they work alone?			
Do they work late at night or during early morning hours?			
Is the workplace often understaffed?			
Is the workplace located in an area with a high crime rate?			
Do employees enter areas with a high crime rate?			
Do they have a mobile workplace (patrol vehicle, work van, etc.)?			
Do they deliver passengers or goods?			
Do employees perform jobs that might put them in conflict with others?			
Do they ever perform duties that could upset people (deny benefits, confiscate property, terminate child custody, etc.)?			
Do they deal with people known or suspected of having a history of violence?			
Do any employees or supervisors have a history of assault, verbal abuse, harassment, or other threatening behavior?			
Other risk factors – please describe:			

SUMMARY

Aggressive and assaultive behavior is a complex issue and dealt effectively with an appropriate management plan. Environmental modification and safety of another person as well as the patient should be our priorities. Non pharmacological method should be choice of initial response in case of such acute behavioral disturbance. Pharmacological approach should be used only in case of failure of other strategies. Extensive monitoring for physical health and try to find out underlying psychopathological issues should important aspect of care. Certain points like definition of treatment end points, proper assessment instrument for response measurement and issues related to consent and library of patients required further research in this area.

REFERENCES

1. Bourn J, Maxfield A, Terry A, Taylor K. A Safer Place to Work: Protecting NHS Hospital and Ambulance Staff from Violence and Aggression. London 2003.

2.   Violence and aggression: short-term management in mental health, health and community settings NICE guideline Published: 28 May 201

3.   Muthuvenkatachalam S, Gupta S. Understanding aggressive and violent behavior in psychiatric patients. Indian J Psy Nsg 2013;5:42-6

4.   Gates DM, Ross CS, McQueen L. Violence against emergency department workers. The Journal of emergency medicine. 2006;31:331-37.

5.   Pettit B, Greenhead S, Khalifeh H, Drennan V, Hart TC, Hogg J, et al. At risk, yet dismissed: the criminal victimisation of people with mental health problems.
London: MIND; 2013

6.   Swanson JW. Mental disorder, substance abuse, and community violence: an epidemiological approach. In: Monahan J, Steadman H, eds. Violence and Mental Disorder: Developments in Risk Assessment. Chicago, IL: University of Chicago Press; 1994. p. 101-36.

7.   Douglas KS, Guy LS, Hart SD. Psychosis as a risk factor for violence to others: a meta-analysis. Psychological Bulletin. 2009;135:679.

8.   Fazel S, Gulati G, Linsell L, Geddes JR, Grann M. Schizophrenia and violence: systematic review and meta-analysis. PLoS Medicine. 2009;6.

9.   Fazel S, Lichtenstein P, Grann M, Goodwin GM, Långström N. Bipolar disorder and violent crime: new evidence from population-based longitudinal studies and systematic review. Archives of General Psychiatry. 2010;67:931-38.

10.   Link BG, Stueve A. Psychotic symptoms and the violent/illegal behavior of mental patients compared to community controls. Violence and mental disorder: Developments in risk assessment. 1994:137-59

11.   Nicholls TL, Brink J, Greaves C, Lussier P, Verdun-Jones S. Forensic psychiatric inpatients and aggression: an exploration of incidence, prevalence, severity, and interventions by gender. International Journal of Law and Psychiatry. 2009;32:23-30.

12.   Ilkiw-Lavalle O, Grenyer BF. Differences between patient and staff perceptions of aggression in mental health units. Psychiatric Services. 2003;54:389-93.

13.   Paterson B, McKenna K, Bowie V. A charter for trainers in the prevention and management of workplace violence in mental health settings. The Journal of Mental Health Training, Education and Practice. 2014;9:101-08

14.   Douglas KS, Skeem JL. Violence risk assessment: getting specific about being dynamic. Psychology, Public Policy, and Law. 2005;11:347.

15.   Almvik R, Woods P, Rasmussen K. The Brøset Violence Checklist sensitivity, specificity, and interrater reliability. Journal of Interpersonal Violence. 2000;15:1284-96.

16.   Monahan J, Steadman HJ, Appelbaum PS, Grisso T, Mulvey EP, Roth LH, Robbins PC, Banks S, Silver E. The classification of violence risk. Behav Sci Law. 2006;24(6):721-30.

17.   Ogloff JR, Daffern M. The dynamic appraisal of situational aggression: an instrument to assess risk for imminent aggression in psychiatric inpatients. Behav Sci Law. 2006;24(6):799-813.
18.   Douglas, Kevin & Hart, Stephen & Webster, Christopher &Belfrage, Henrik & Guy, Laura & Wilson, Catherine. (2014). Historical-Clinical-Risk Management-20, Version 3 (HCR-20 V3): Development and Overview. International Journal of Forensic Mental Health. 13. 93-108.
19.   Sorgi P, Ratey JJ, Knoedler DW, Markert RJ, Reichman M. Rating aggression in the clinical setting: a retrospective adaptation of the Overt Aggression Scale: Preliminary results. The Journal of Neuropsychiatry and Clinical Neurosciences. 1991:S52-56.
20.   Bowers L, Brennan G, Ransom S, Winship G, Theodoridou C. The nursing observed illness intensity scale (NOIIS). Journal of Psychiatric and Mental Health Nursing. 2011a;18:28-34.
21.   Hare RD. Manual for the Hare Psychopathy Checklist – Revised. Second edn. New York, NY: Multi-Health Systems Inc.; 2003.
22.   Webster CD, Nicholls TL, Martin ML, Desmarais SL, Brink J. Short-Term Assessment of Risk and Treatability (START): The case for a new structured professional judgment scheme. Behav Sci Law. 2006;24(6):747-66.
23.   Gregório Hertz P, Eher R, Etzler S, Rettenberger M (2021) Cross-validation of the revised version of the Violence Risk Appraisal Guide (VRAG-R) in a sample of individuals convicted of sexual offenses. Sexual Abuse 33(1):63–87.
24.   Guidelines for Preventing Workplace Violence for Healthcare and Social Service Workers.U.S. Department of Labor Occupational Safety and Health Administration.OSHA 3148-06R 2016
25.   Grover S, Avasthi A. Clinical practice guidelines for management of delirium in Elderly. Indian J Psychiatry 2018;60:329-40.
26.   Richmond JS, Berlin JS, Fishkind AB, Holloman GH Jr, Zeller SL, Wilson MP, Rifai MA, Ng AT. Verbal De-escalation of the Agitated Patient: Consensus Statement of the American Association for Emergency Psychiatry Project BETA De-escalation Workgroup. West J Emerg Med. 2012 Feb;13(1):17-25.

27.   Raveesh BN, Lepping P. Restraint guidelines for mental health services in India. Indian J Psychiatry 2019;61:S698-705

28.   Huf G, Coutinho E, Adam C. Physical restraints versus seclusion room for management of people with acute aggression or agitation due to psychotic illness (TREC-SAVE): a randomized trial. Psychological medicine. 2012;42:2265-73.

29.   Stewart D, Bowers L, Simpson A, Ryan C, Tziggili M. Manual restraint of adult psychiatric inpatients: a literature review. Journal of Psychiatric and Mental Health Nursing. 2009;16:749-57

30.   van Der Merwe M, Bowers L, Jones J, Simpson A, Haglund K. Locked doors in acute inpatient psychiatry: A literature review. Journal of Psychiatric and Mental Health Nursing. 2009;16:293-99.

31. Happell B, Harrow A. Nurses' attitudes to the use of seclusion: a review of the literature. International Journal of Mental Health Nursing. 2010;19:162-68.

32. Ruth Gerson et.al, Best Practices for Evaluation and Treatment of Agitated Children and Adolescents (BETA) in the Emergency Department: Consensus Statement of the American Association for Emergency Psychiatry Western Journal of Emergency Medicine Volume 20, no. 2: March 2019.

33. Leonardo Baldacara et.al, Brazilian guidelines for the management of psychomotor agitation. Part 2. Pharmacological approach. Braz J Psychiatry. 2019 Jul-Aug;41(4):324-335

34. Veronica B. Searles Quick et.al, Which Emergent Medication Should I Give Next? Repeated Use of Emergent Medications to Treat Acute Agitation. Frontiers in Psychiatry December 2021, Volume 12, Article 750686.

35. Violence and aggression: short-term management in mental health, health and community settings NICE guideline Published: 28 May 2015

36. Maxine X Patel, Faisil N Sethi et.al Joint BAP NAPICU evidence-based consensus guidelines for the clinical management of acute disturbance: De-escalation and rapid tranquillisation, Journal of Psychopharmacology ,1–40

37. Wilson et al, The Psychopharmacology of Agitation: Consensus Statement of the American Association for Emergency Psychiatry Project BETA Psychopharmacology Workgroup Western Journal of Emergency Medicine Volume XIII. no. 1: February 2012

38. Zeller et.al, Managing Agitation Associated with Schizophrenia and Bipolar Disorder in the Emergency Setting, Western Journal of Emergency Medicine

39. Taylor David, Barnes Thomas, Young Allen The Maudsley Prescribing Guidelines in Psychiatry, Willey Blackwell

40. TREC Collaborative Group. Rapid tranquillisation for agitated patients in emergency psychiatric rooms: a randomised trial of midazolam versus haloperidol plus promethazine. BMJ 2003; 327:708–713.

41. Alexander J, et al. Rapid tranquillisation of violent or agitated patients in a psychiatric emergency setting. Pragmatic randomised trial of intramuscular lorazepam v. haloperidol plus promethazine. Br J Psychiatry 2004; 185:63–69.

42. Huf G, et al. Rapid tranquillisation in psychiatric emergency settings in Brazil: pragmatic randomised controlled trial of intramuscular haloperidol versus intramuscular haloperidol plus promethazine. BMJ 2007; 335:869.

43. Raveendran NS, et al. Rapid tranquillisation in psychiatric emergency settings in India: pragmatic randomised controlled trial of intramuscular olanzapine versus intramuscular haloperidol plus promethazine. BMJ 2007; 335:865.

44. Stephen R. Marder, A Review of Agitation in Mental Illness: Treatment Guidelines and Current Therapies, J Clin Psychiatry 2006;67 [suppl 10]

45. APA publication, Textbook of Violence Assessment and Management

Clinical Practice Guidelines for the Assessment and Management of Elderly Presenting with Psychiatric Emergencies

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Introduction

The elderly population is increasing globally, and India is no exception. This rise in the elderly population is due to increased life expectancy. The most common psychiatric disorders among the elderly include dementia and depression. Compared to the adult population, the health care needs of the elderly are higher due to the high rates of comorbidities and multimorbidities. There is also high comorbidity between mental disorders and physical diseases. Due to the high prevalence of comorbidities and multimorbidities, many elderly patients are on multiple medications. All the factors make the elderly often complex patients.

Comorbidity refers to the occurrence of two chronic conditions in the same person. Multimorbidity is the presence of multiple medical conditions in a single individual. Different systematic reviews that have included data from different countries have estimated the prevalence of multimorbidity to range from 13-95%, with higher prevalence among the elderly compared to other age groups and increase in prevalence with increasing age (Volan, 2014; Fortin et al., 2012).Multimorbidity is associated with poor quality of life, higher treatment burden, reduced perception of quality of care received, poor caregiving experience, including development of physical and mental health morbidity among the caregivers, higher negative caregiving experience for the health care providers, and higher health care utilization and economic burden. Multimorbidity is further understood as concordant or discordant multimorbidity. The concordant multimorbidity usually emerges at the same time and requires similar treatment. Examples of such multimorbidity include co-occurring coronary artery disease and cerebrovascular disease. The discordant multimorbidity has the occurrence of multiple conditions that usually appear to be unrelated to each other and resultantly require different management approaches. The commonly noted discordant multimorbidity in the elderly includes physical diseases and mental disorders (Academy of Medical Sciences, 2018). Data suggest that elderly patients with mental disorders are more often on polypharmacy (de Lima et al., 2020). Evidence suggests that as the number of multiple physical illnesses increases, there is an increase in the prevalence of mental disorders. Data also indicate that patients with depression, psychosis, and sub-clinical psychosis have a higher prevalence of physical conditions. Multi-morbidity has also been associated with a higher rate of cognitive decline (Academy of Medical Sciences, 2018). The presence of multimorbidity among the elderly makes them more vulnerable to seeking emergency care.

Emergency medical care is at the crossroads of inpatient and outpatient medical care. The emergency and accident services provide care to patients coming with critical illnesses. Data suggest that the elderly account for 12-24% of the emergency visits, which is higher than that for young adults (Samaras et al., 2010; Shah et al., 2007; Keskinoglu & Inan, 2014). Data suggest that the elderly have multiple emergency visits and require hospitalization (Legramante et al., 2016). Studies from different parts of the world indicate that the elderly presenting to emergency have a high prevalence of mental disorders and substance use disorders (Dapap et al., 2020). A systematic review that included patients' data at admission to the emergency department estimated the prevalence of delirium to range from 7 to 20% (Barron & Holmes, 2013). Other studies have evaluated the prevalence of cognitive impairment varying from 26-40% in elderly presenting to emergency services (Hustey&Meldon, 2002; Naughton et al., 1995; Gerson et al., 1994). The prevalence of alcohol misuse among the elderly seen in an emergency has been estimated to be 14% (Adams et al., 1992), and that of substance use disorders in a lifetime has been estimated to be 45.5%. The prevalence of recent use (i.e., in the last three months) has been estimated to be 27.0% (Dapap et al., 2020). It is further shown that patients presenting to emergency services with comorbid substance use disorders have higher mortality rates (Wei et al., 2021). The presence of multiple physical illnesses and polypharmacy increases the risk of delirium, which often warrants emergency care (Grover and Avasthi, 2018- Delirium IPS guidelines). A study from India that screened elderly patients presenting to the emergency medical outpatient settings for psychiatric disorders estimated that 47.4% of patients have at least one axis-I psychiatric disorder and 35.3% have a substance use disorder, with an overall prevalence of either axis-I disorder or a substance use disorder to be 62%. In terms of specific psychiatric disorders, delirium was the most common disorder, seen in one-third (34.1%) of patients, followed by dementia (9.5%), depressive disorders (8.2%), adjustment disorder (3%), and anxiety (not otherwise specified) disorder in 3.4%. Regarding substance use disorders, 31% of participants had tobacco dependence, and 19.8% had alcohol dependence syndrome. A higher prevalence of delirium and dementia was seen among those aged > 70 years (Grover and Avasthi, 2018). All these suggest a need to assess the elderly presenting to the emergency services more thoroughly for mental disorders.

Indian Psychiatric Society published clinical practice guidelines (CPGs) for managing various psychiatric disorders amongst the elderly in 2007 and 2018. These guidelines covered various psychiatric disorders seen among the elderly but did not focus on assessing the elderly in an emergency setting. This guideline provides a broad framework for assessing and

managing psychiatric morbidity among elderly patients presenting to the emergency. In India, the association of mental professionals in emergency services varies. Hence, these guidelines are not particularly applicable to any specific model of psychiatric care in emergency and will require minor modifications to suit the needs of patients, service model, and precise setting. The recommendations are primarily meant for elderly patients seen in emergency setting. However, these can also applied to elderly patients seen in consultation-liaison setting too. It is expected that proposals will have to be tailored to suit the needs of individual patients.

**Engagement of mental health professionals in the emergency setting**

In India, emergency services are labeled differently across the country. Sometimes, hospital-based emergencies are labeled as emergency, casualty, emergency medical or surgical outpatient, and trauma services. Further, the terminology emergency medical services have also been extended to include out-of-hospital acute medical care and/or transport to definitive care. Accordingly, the involvement of mental health professionals in the emergency setting varies depending on the service model. In most places, psychiatrists are on-call and attend to patients in the emergency when called by the physician or surgeons. In institutional settings, at a few places, trainee residents are posted in the emergency and provide services at the request of the physicians. This model has improved referral rates (Grover et al., 2015). In most private settings, too, psychiatrists are available on-call. Once a patient presents with a psychiatric emergency or a patient known to be suffering from a psychiatric ailment presents to the emergency, often there is a tussle between the physician/surgeon about who will act as the primary treating team. In such a situation, it is crucial to have open communication and good collaboration with the physicians. Both teams should collaborate initially to conclude the cause of the presentation and should be available to shift the patient under their care and act as the primary treating team (Grover & Singh, 2022). It is always better to have a good consultation liaison and local standard operating procedures to facilitate patient care.

Common Psychiatric Emergencies among the elderly encountered in the emergency setting

Any psychiatric disorder can present in the emergency setting. However, the commonly encountered psychiatric emergencies in the emergency setting include agitation, aggression, lack of cooperation in treatment, suicidal behavior including medication overdose, altered mental status, catatonia, substance withdrawal/intoxication, panic attacks, dissociative disorders, psychosocial crisis, Toxidromes (neuroleptic malignant syndrome, serotonin syndrome, anticholinergic syndrome), medication withdrawal states (antidepressant withdrawal syndrome, catatonia due to withdrawal of antipsychotics, benzodiazepines),

psychotropic related neurological emergencies (examples, dystonia, akathisia, seizures, etc.) and psychotropic related medical-surgical emergencies (i.e., hyponatremia, gastrointestinal bleeding, falls due to use of psychotropics, etc.). A psychiatrist may also be called to provide clearance for surgery or assess the patient's capacity to consent to a procedure. Further, a psychiatrist may be called to evaluate an elderly patient who is a victim of elder abuse (Figure-1).

Figure-1: Common Psychiatric Emergencies among the Elderly
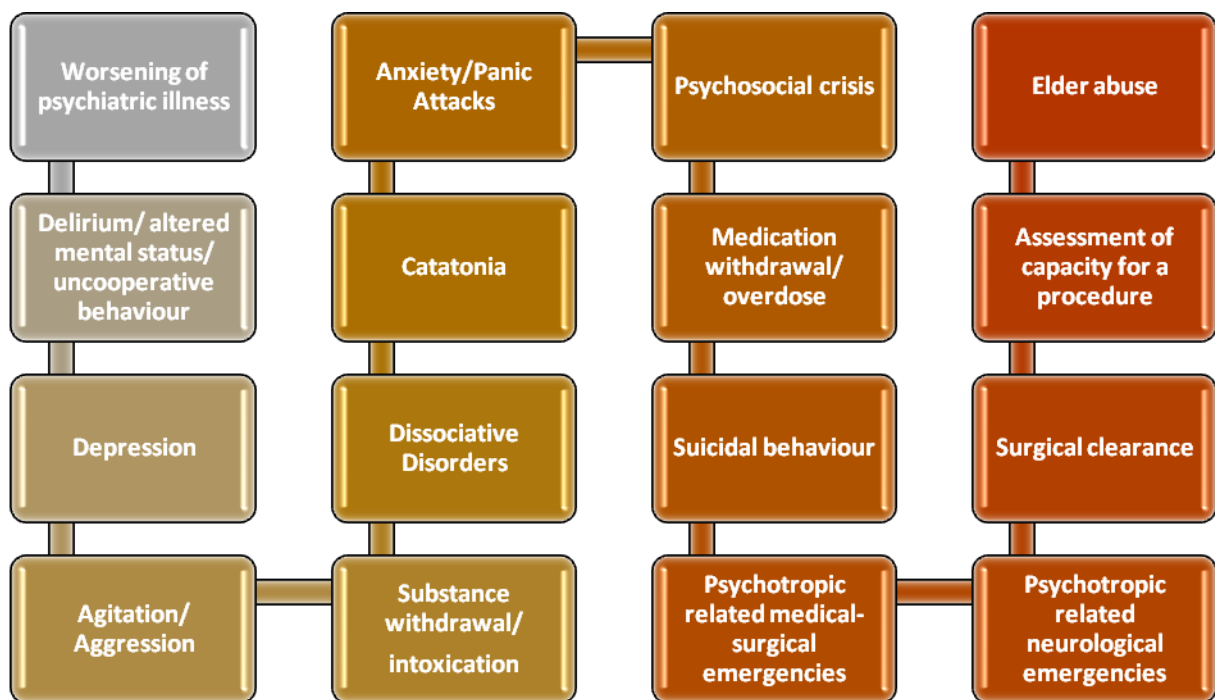
Psychiatric Assessment of Elderly persons presenting to an emergency

An elderly presenting to the emergency setting with psychiatric symptoms can present with first onset psychiatric symptoms, worsening of the previously known psychiatric illness, or the emergence of new-onset in a person already known to be suffering from a psychiatric ailment. The basic principles of psychiatric assessment remain the same, i.e., thorough history taking, physical examination, mental status examination, and carrying out the required investigations. While taking history, the clinicians should not only focus on psychiatric history but also comorbid physical illnesses.

In an elderly presenting with a new-onset psychiatric syndrome, it is imperative to consider the possibility of psychiatric manifestations being due to an underlying medical-surgical illness or medical emergency. Further, some medical emergencies may present symptoms akin to psychiatric syndrome (myocardial infarction simulating a panic attack). In such a

situation, it is always of paramount importance to rule out possible medical morbidity. Because elderly patients often have underlying multimorbidity, a decompensation in the underlying medical illness or medications used to manage medical diseases can also precipitate psychiatric emergencies. Further, it is essential to remember that physicians tend to prescribe psychotropics independently without seeking psychiatric consultations. Hence, the possibility of psychiatric emergencies related to the ongoing psychotropic medication or withdrawal due to psychotropics must be considered while considering a different differential diagnosis.

In a patient who is suffering from mental illness, while evaluating psychiatric history, it must be remembered that an elderly known to be suffering from a mental illness can present with a new onset medical and psychiatric emergency (for example, delirium in a patient with dementia). Further, some psychiatric emergencies may be precipitated by the continued use of substances or sudden withdrawal of substances. This group of patients may also develop worsening of the underlying psychiatric illness and emergencies related to the use or withdrawal of ongoing psychotropic medications.

History Taking

Accordingly, while history taking, the clinicians should focus on the onset of the current symptoms and ongoing psychiatric symptoms and their association with any decompensation of the continuous or new-onset medical illness, the addition of any new medication (psychotropic or non-psychotropic), removal of any drug (psychotropic or non-psychotropics) in the recent times, substance use pattern (any recent change in the way of substance use, any new substance use), history of fall, any change in the sleep pattern, eating habits, and social support. Due importance should also be given to the assessment of sensory deprivation (visual or auditory) and review of frailty. Assessment of elder abuse requires a high index of suspicion. Treatment history requires careful evaluation of ongoing medications in terms of all the ongoing drugs, medication supervision, medication adherence, and any recent change in the prescription or doses of the ongoing medications. It is important to remember that the elderly have a lower level of physiological reserve. Hence any tiny change should be given due importance while evaluating the drug intoxication/withdrawal.

Further, while evaluating the addition or withdrawal of any medications, the issue of drug interaction should be kept in mind. In addition to the prescribed medications, importance should also be given to the use of over-the-counter medications (medications for sleep, constipation, anti-allergic, anti-tussive, etc.), and medications from other pathies (Homeopathy/Ayurvedic). Another critical aspect of evaluating medication history is

assessing the total anticholinergic burden of all the ongoing medications in the patient, as the high anticholinergic burden is one of the crucial causes of delirium.

All patients should also be evaluated for any psychosocial stressors. These could be either of recent onset or have been present over time. The temporal association of the psychiatric symptoms in terms of beginning and worsening with the stressors should be understood.

Focusing on the patient's mobility is also essential. The elderly are more prone to falls, especially when they require mobility aids to walk, sedative medications, or those that can lead to postural fall of blood pressure. If a patient presents with a fall, evaluation in terms of the place of fall, an activity that the patient was involved in, the type of fall, and the presence of any symptoms such as dizziness, fainting, and weakness in posture change (such as that standing from sitting/lying down posture). Intoxication with substances should also be kept in mind while evaluating falls. Additionally, the association of falls with psychotropics known to cause postural hypotension must also be kept in mind.

Due importance should also be given to assessing the patient's cognitive performance in the history. Poor cognitive functioning can contribute to poor medication adherence, intake of wrong medication, or accidental poisoning; when a patient is not supervised, unknowing consume undesirable things. Clinicians should also give due importance to the evaluation of the course of cognitive performance over time, especially in recent few months, few weeks, few days, or few hours, as this can provide essential clues about the diagnosis, possible onset of psychiatric syndromes, which can further help in identifying the precipitating and or the contributory factor(s). Due importance should also be given to collecting information about the daily fluctuation in the cognitive functions and any recent change in the pattern, as this can also provide important diagnostic clues.

Understanding the available social support is also essential, as this influences the care the elderly may receive in their home setting. Collecting information about elder abuse (which is understood as the acts of omission that result in harm or threatened harm to the health or welfare of an older person) is a sensitive issue, and its history of the same should be carefully evaluated. The patient should be interviewed separately and given time and reassurance to open up (Borja et al., 2007).

In case the patient has already made a suicide attempt, it should be evaluated in terms of lethality, understanding of the patient about the consequences of the act, and preparation made before the action so that others do not find out about him/her.

While history taking, an effort should be made to collect information from all the available sources, including the patients, family members, caretakers, etc. Efforts should be made to

talk to the previous clinicians managing various physical and psychiatric conditions (Table-1).

Physical Examination

In general, psychiatrists often do not give much importance to physical examination. However, this is of paramount importance in the emergency setting as this plays an important role in providing clues to the underlying medical causes of psychiatric syndromes and distinguishing psychiatric syndromes associated with underlying general medication from psychiatric syndromes not associated with underlying general medical conditions. It is important to remember that some new-onset psychiatric symptoms (agitation/ aggression) or psychiatric syndrome (delirium) may be related to the underlying general medical conditions. A thorough physical examination can also help distinguish between different toxidromes; provide evidence for features of various psychotropic medications and medication intoxications/withdrawal. Vitals (pulse, blood pressure, respiratory rate) should also be evaluated, as these can provide additional clues about various clinical conditions. Evaluation of body temperature can also provide information about multiple toxidromes, underlying sepsis, or infection.

During the physical examination smell of the patient's breath should not be ignored as this can provide important clues about underlying physical illness and associated medical emergency (for example, the fruity smell in patients with diabetic ketoacidosis) or substance intoxication (smell of alcohol).

Another critical aspect of evaluation is evaluating the patient's general health in frailty and obesity. Frailty is a biological syndrome characterized by lower reserve and resistance to stress resulting from cumulative functional decline in multiple physiological systems, leading to vulnerability to adverse outcomes (Campbell & Buchner, 1997). It is associated with falls, hospitalization, and mortality. The characteristic features of frailty include unintentional weight loss, impaired grip strength, self-reported exhaustion, slow walking speed, and reduced physical activity. It is also reported to be associated with severe adverse outcomes during the first 30 days after discharge from an emergency (McCabe & Kennelly, 2015). Due importance in history should also be given to the assessment of daily living and instrumental activities of daily living.

While carrying out a physical examination, the presence of injury marks should also be given due importance, which may be indicators of physical abuse. Another important aspect of physical examination is an assessment of catatonia. Clinicians often miss out on subtle catatonic signs. Identification of catatonia is essential because it can prompt the clinicians to

carry out the Lorazepam challenge test, which is a significant proportion of patients and may lead to dramatic improvement. It is also important to remember that physical examination should not be a one-time effort but should be repeated from time to time, as continuous monitoring of various physical signs and symptoms can help clarify the diagnosis (Table-1).

Mental status examination (MSE)

Mental status examination in the emergency setting is one of the most critical aspects of evaluating the elderly. The initial evaluation should be on the AVPU (**A**-Alert, i.e., the patient is awake, oriented, responsive, and able to communicate; **V**-may appear unresponsive to start with but responds to the loud verbal stimulus; P-painful, i.e., the patient does not respond to the verbal command, but responds only to the painful stimulus such as sterna rub or pinching; **U**- Unresponsive, i.e., the patient does not respond to either verbal stimuli or the painful stimuli). Initial brief evaluation and understanding of the level of response in AVPU can also help determine which should be the primary treating team. Based on history and physical examination findings, the psychiatrist or the other specialist can be the primary team for an alert patient(Figure-2). However, patients who only respond to painful stimuli or are unresponsive to stimuli should be primarily assessed by the physician, even though the patient may have a past psychiatric history or new-onset psychiatric manifestations. Physicians should primarily assess patients who respond to loud verbal stimuli. However, the psychiatrist can provide their input based on their history and mental status examination about the possible diagnosis and management.

Figure-2: Deciding about the primary team
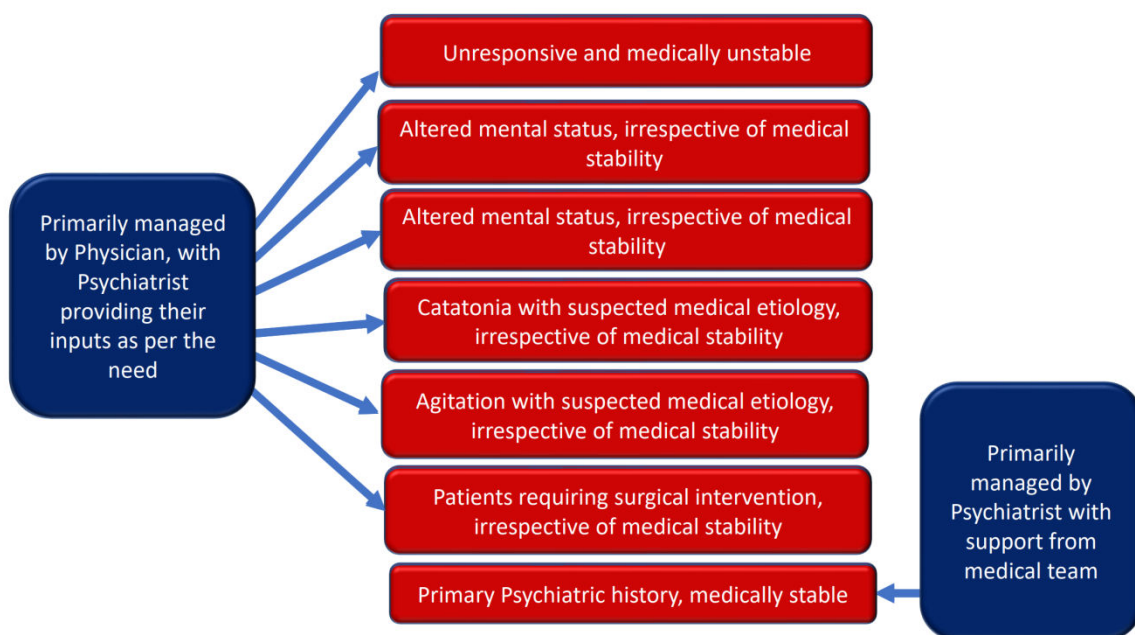
An essential aspect for the psychiatrist to remember is that some patients may change from one level to another rapidly, i.e., an unresponsive patient may become fully alert or start responding to loud verbal commands. Hence, the psychiatrists should be prepared to assess the patient's mental state from time to time and document the findings of each assessment. A rapid fluctuation in the level of response from fully alert to the loud verbal command may indicate delirium.

In fully alert patients or those responding to loud verbal commands, efforts should be made to carry out a detailed mental status examination, as in other situations. While doing so, any kind of sensory deprivation should be kept in mind, and if these could be corrected, it should be done before proceeding with mental status examination. It is important to remember that carrying out MSE in elderly patients requires patience and compassion. It is also crucial that the clinician is respectful towards the elderly patients. It is also paramount that the clinician carrying out MSE speak slowly and clearly and check with the elderly whether they could understand the question or not, and if required, the questions should be repeated. During the MSE, it is also crucial to use non-verbal communication like standing close to the patient, and touching the patient, as these can encourage the elderly to be more cooperative.

Due importance should be given to assessing the cognitive functions and psychomotor activity, besides evaluating the speech, mood, form of thought, the content of thought, and perception. This examination can provide diagnostic clues about the underlying psychiatric syndrome. While assessing cognitive function, every effort must be made to get the best out of the patient, rather than focusing on a higher level of dysfunction. For assessment of cognitive functions, structured instruments like mini-mental status examination (MMSE), Hindi mental status examination (HMSE), and Montreal Cognitive Assessment (MoCA) can be used. Similarly, the level of agitation or psychomotor retardation may also be recorded using specific scales for assessing agitation, such as the Richmond Agitation Sedation scale (RASS).

The assessment of suicidality is essential to evaluate an elderly patient presenting with psychiatric symptoms to the emergency. All patients should be actively asked about current suicidal ideations and active suicidal plans. This becomes much more important in patients with self-harm or those reporting hopelessness.

Use of structured scales

The assessments (physical and mental status examinations) can be supplemented by structured scales (Table-2). Structured scales can be used to assess other aspects of history, physical examination (for example, frailty index to assess frailty), and mental status

examination (Beck Depression Inventory to rate the severity of depression, Delirium Rating Scale-98 Revised (DRS-R98 to evaluate the severity of delirium). Similarly, screening instruments for various diagnoses (such as the confusion assessment method (CAM)) can be used to screen patients for any specific diagnosis.

Investigations

All patients presenting to the emergency should undergo certain basic investigations, and depending on the findings of history, physical examination, and mental status examination, further investigations can be considered. The primary investigation panel should include a haemogram, renal function tests, serum electrolytes, liver function test, serum glucose levels, X-ray chest, and electrocardiogram. All patients with the new-onset psychiatric syndrome should also undergo neuroimaging. Additionally, neuroimaging should be considered in patients with neurological signs or symptoms, those with a pre-existing neurological condition or brain pathology, if a patient has a significant change in clinical presentation, among those with a family history of neurological disorders, presence of the history of head injury, presence of seizures, delirium, recent or progressive cognitive decline, and before electroconvulsive therapy (Rego & Velakoulis, 2019; Lippmann, 2013) (Table-1). Other investigations should be decided based on the clues from the history, physical examination, and mental status examination. The investigations should be repeated from time to time to monitor the clinical status of the patients.

Forensic Issues

Patients facing elder abuse may require ensuring their safety of the patient. Suppose the assessment suggests that the patient's safety may be compromised during the hospital stay or after discharge. In that case, appropriate steps must be taken to report the same to the police to initiate legal action.

Diagnosis

Diagnosis of all psychiatric syndromes should be made per the standard nosological system. However, it is essential to remember that some of the symptoms (such as agitation) and psychiatric disorders (such as delirium and catatonia) can be due to varied conditions (Table-3). Similarly, there could be an overlap of symptoms between various toxidromes, intoxication states, and withdrawal states (Table-4). A careful history, physical examination, mental status examination, and specific investigations can clarify the same. It is also important to remember that patients with dementia can develop superimposed delirium.

Etiological Assessment

As many psychiatric emergency presentations may be caused by underlying medical illness, ongoing medication (toxicity/withdrawal), or substance use (intoxication/withdrawal), it is crucial to evaluate the possible underlying etiologies.

In this regard, it is also important to remember that although the primary presentation may be with psychiatric symptoms possibility of manifestation of medical illness mimicking a psychiatric syndrome should be kept in mind because any misdiagnosis can lead to adverse outcomes in the form of mortality. For example, the clinical presentation of myocardial infarction may mimic anxiety. Anxiety may manifest in angina, arrhythmia, asthma and other pulmonary diseases, pulmonary embolism, hypoglycemia, and temporal lobe epilepsy. The new onset of psychosis in the elderly may manifest in thyrotoxicosis, hyperparathyroidism, adrenal insufficiency, seizure disorder, space-occupying lesion in the brain, etc. (Bessay et al., 2018). Similarly, agitation may be a marker of pain or full bladder.

While evaluating the underlying etiology of delirium, catatonia, and agitation, it is essential to remember that many organic conditions can cause these syndromes/symptoms (Table-5, 6,7). It is also important to remember that agitation may result from delirium and catatonia. Additionally, agitation can also be seen due to various psychiatric disorders. A careful history can help to distinguish between agitation due to underlying general medication conditions and primary psychiatric disorder (Table-8).

During the assessment, it is also important to remember that patients with various primary medical illnesses, psychiatric disorders (on treatment/ not on treatment), and toxidromes can develop secondary medical complications, such as secondary infections (aspiration pneumonia), organ failure(s), head injury, etc. which can make the diagnostic clarification difficult, and require immediate attention.

Table-1: Basic Assessment of the patient in the emergency setting

History taking
Onset and course of psychiatric symptoms: new-onset, known to be suffering from psychiatric illness with worsening of symptoms, known to be suffering from psychiatric illness, now presenting with a different set of psychiatric symptoms, known to be suffering from psychiatric illness but now presenting with new medical symptoms   **Current psychiatric symptoms:** altered mental state, agitation, aggression, suicidal ideations/attempt, anxiety, dissociation, depression, psychotic symptoms, catatonia, etc   - Cognitive symptoms: any cognitive deficits in the patient, any change in cognition in a patient with no cognitive impairment or those with pre-existing cognitive impairment   **Chronic medical illnesses:** diabetes mellitus, hypertension, coronary artery disease, cerebrovascular disease, Parkinson's disease, Epilepsy, etc   **Current medical symptoms:** Fever, diaphoresis, loose motions, constipation, stupor, coma, breathing difficulty, seizures, etc

- **Substance use:** type of substance, the pattern of substance, any recent increase or decrease in the quantity of substance, last intake of the substance
- **Self-harm behavior/accidental overdose:** medication overdose, self-poisoning, accidental poisoning
- **Medication history:** review all the prescription (psychotropics and non-psychotropics) drugs, over-the-counter medications, self-medications, any recent change in the medicines, any recent change in medication doses, medication adherence, and anticholinergic burden
- **Temporal relationship:** current psychiatric symptoms with current medical symptoms, current psychiatric symptoms with a course of the chronic medical symptoms, current psychiatric symptoms psychotropic medications, present psychiatric symptoms with non-psychotropic drugs, current medical symptoms with psychiatric symptoms (current and long-term), current medical symptoms with psychotropic medications
- **Mobility and falls:** any walking difficulty, evidence suggestive of postural fall, history of recent falls
- **Sensory deprivation:** visual impairment, auditory impairment
- **Psychosocial stressors:** ongoing stressors for the long run, recent psychosocial stressors
- **Available social support:** who is/are the caregiver(s), emotional bonding with the patient, time spent with the patient, etc
- **Elder abuse:** look for elder abuse

Physical Examination
- Level of consciousness: coma, stupor, delirium
- Vitals: pulse, blood pressure, respiratory rate, temperature, jaundice
- Pupil size
- Skin: dry, warm/cold, diaphoresis
- Oral cavity- dry/salivation
- Cardiovascular examination
- Respiratory examination
- Gastrointestinal: sluggish or increased bowel sound, evidence for constipation or loose motions, hepatomegaly, splenomegaly
- Neurological examination: neurological deficits, plantar, clonus, reflexes, size of the pupil
- Other symptoms: diaphoresis, dry skin
- Catatonic signs: rigidity, waxy flexibility, mitgehan, mitmachen, grimacing, automatic obedience, ambitendency, staring, mannerism, echopraxia, etc
- The smell of the breath
- Bladder: evidence of full bladder
- Frailty, obesity
- Evidence for nutritional deficiencies
- Injury marks

Mental status examination
- Level of responsiveness: alert, responds to verbal stimuli, responds to painful stimuli only, no response to verbal or painful stimuli.
- Type of psychiatric symptoms: anxiety and worries, depressive cognitions, delusions, hallucinations
- Cognitive functioning
- The course of psychiatric symptoms
- Suicidal ideations

Investigations
- **Routine investigations:** haemogram, renal function tests, serum electrolytes, liver function test, serum glucose levels, X-ray chest and electrocardiogram, urine drug screen, Vitamin-B12 levels, Vitamin D levels, Arterial Blood Gas (ABG) analysis

- **Neuroimaging:** new-onset psychiatric syndrome, patients with neurological signs or symptoms, those with a pre-existing neurological condition or brain pathology, if a patient has a significant change in clinical presentation, among those with a family history of neurological disorders, presence of the history of head injury, presence of seizures, delirium, recent or progressive cognitive decline, and before electroconvulsive therapy
- **Others:** based on the history, physical examination, and investigation reports

Note: The clinician can modify and customize the assessment as per the need of individual patient

Table-2: Scales for assessment of different psychiatric conditions (by physicians or psychiatrists)

Psychiatric condition	Screening instruments
The general level of responsiveness	Glasgow Coma Scale
Agitation	Richmond Agitation Sedation Scale Behavioral Activity Rating Scale
Delirium	Confusion Assessment Scale (CAM) Confusion Assessment Scale Intensive care unit (CAM-ICU) Delirium Rating Scale-Revised-98
Depression	Patient Health Questionnaire-2 (PHQ-2) Patient Health Questionnaire-9 (PHQ-9) Beck depression inventory
Catatonia	Bush Francis Catatonia Screening Inventory Bush Francis Catatonia Rating Scale
Anxiety	Generalized Anxiety Scale-7
Cognitive functions	Mini-mental Status Examination Hindi-mental status examination Montreal Cognitive Assessment
Premorbid cognitive functioning	Short form of the Informant Questionnaire on Cognitive Decline in the. Elderly (IQCODE)
Dementia	Dementia Rating Scale
Behavioral and Psychological Symptoms of dementia	Neuropsychiatric inventory
Suicidality	SAD PERSON SCALE Beck Suicidal inventory
Alcohol withdrawal	Clinical Institute Withdrawal Assessment for Alcohol Scale (CIWAS-Ar)
Opioid Withdrawal	Clinical Opioid Withdrawal Scale
Elder Abuse	Caregiver Abuse Screen Evaluation
Frailty	Frailty Index
Assessment of activities of daily living	Katz Index of Independence in Activities of Daily Living
Instrumental activities of daily living	Lawton Instrumental Activities of Daily Living Scale (IADL)

Table-3: Overlap of psychiatric syndromes and symptoms commonly seen in emergency

	Agitation	Altered mental state (delirium)	Mania	Psychosis	Anxiety	Depression	Catatonia
Organic conditions	√	√	√	√	√	√	√
Delirium	√	X	-	-	-	-	√
Mania	√	-	X	√	-	-	√
Psychosis	√	-	-	X	√	√	√
Anxiety	√	-	-	√	X	√	-
Depression	√	-	-	√	√	X	√
Catatonia	√	√	√	√	√	√	X
Dementia with BPSD	√	-	√	√	√	√	√
Pain	√	√	-	-	√	√	-
Akathisia	√	-	-	-	√	-	-
Substance intoxication	√	√	-	-	-	-	-
Substance withdrawal	√	√	√	√	√	√	√
Neuroleptic Malignant Syndrome	√	√	-	-	-	-	√
Anticholinergic syndrome	√	√	-	√	-	-	-
Serotonin syndrome	√	√	-	-	-	-	-
Medication withdrawal	√	√	-	-	-	-	√
Medication overdose	√	√	√	√	√	√	√
Note: Patients with mania, psychosis, depression and anxiety can develop delirium due to various causes, and if delirium is the presenting clinical picture in the background of these disorders, alternative causes for delirium should be evaluated							

Table-4: Differential Diagnosis of Various Toxidromes

	NMS	Serotonin Syndrome	Anticholinergic Syndrome	Malignant Hyperthermia	Antipsychotic toxicity	Antidepressant toxicity-TCAs	Antidepressant toxicity-	Lithium Toxicity	Valproate toxicity	Carbamazepine Toxicity	Benzodiazepine Toxicity	Alcohol Toxicity	Opioid Toxicity	Sympathomimetic Toxicity	Antipsychotic Withdrawal	Antidepressant Withdrawal	Benzodiazepine Withdrawal	Heat Stroke
Temperature	↑	↑	↑	↑	↑	↑	↑	N	↑/↓	↑	↓	↓	↓	↑	↓	↑	N	↑
Muscle Rigidity	↑	↑	N	↑	↑	N	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	□
Tremors	+	+	-	+	+	-	+	+	+	-	-	-	-	-	+	-	+	-
Reflexes	↓	↑	N	↓	↓/N	N	↑	↑	-	↑/↓	↓	-	-	-	↓	-	-	-
Myoclonus	-	+	-	-	-	-	+	+	-	+	-	-	-	-	-	-	+	-
Clonus	-	+	-	-	-	-	+	+	-	-	-	-	-	+	-	-	+	-
Seizures	-	-	+	-	+	+	+	+	-	+	+	+	-	+	-	-	+	+
Altered Sensorium	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Irritability	+	-	+	+	+	+	-	↑	+	-	+	+	-	+	+	+	+	+
Agitation	+	+	+	+	+	+	+	↑	+	+	+	+	-	+	+	+	+	+
Heart Rate	↑	↑	↑	↑	↑	↑	↑	↑/↓	↑	↑	—	-	↑	↑	↑	-	↑	↑
Respiratory Rate	↑	↑	N	↑	↑	N	↑	N	↑	-	↑/↓	↓	↓	-	↑	-	↑	↑
Blood Pressure	↑	↓	↓	↑	↑/↓	↓	↓	↓	↓	↓	↓	-	↓	↑	↑	-	↑	-
Pupil	N	↑	↑	N	N	↑	↑	N	↓	↑	N	N	↓	↑	N	N	N	-
Bowel sound	N	↑	↓	↓	N	↓	↑	N/↑	↑	↓	N	N	↓	N/↑	N	↑	-	-
Skin & Mucosa	D	N	d	D	D	d	N	N	-	-	-	P	-	D	D	-	-	D
CPK levels	↑	-	-	↑	↑	-	-	-	-	-	-	-	-	-	-	↑	-	-
Myoglobinuria	+	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-
Leucocytosis	+	-	-	+	+	-	-	+	-	-	-	-	-	-	-	-	-	-

D-Diaphoresis; d-dry skin; N-Normal Size; +: Present; -: Absent; P-Pale and Blue skin

Table-5: Risk and Etiological factors for delirium (Grover &Avasthi, 2018)

Socio-demographic variables: age > 70 years/ advanced age, male gender, institutionalization
Baseline Mental Status: cognitive impairment/ dementia, depression, social isolation
History: previous history of delirium
Sensory impairment: visual and/or hearing impairment
Medical Illnesses: severe medical illness, high APACHE II score, fracture at admission to the hospital, brain disorders like Parkinson's disease, tumors, infections
Physical status: fever, hypotension, poor functionality/immobility, limited premorbid activity levels
Metabolic disturbances: electrolyte imbalance, anemia, acid-base imbalance, hypoglycemia
Medications **Sedative-hypnotics:** benzodiazepines; especially long-acting agents, barbiturates, Antihistamines (e.g., diphenhydramine) **Narcotics:** Meperidine **Drugs with anticholinergic effects:** Oxybutynin, Tolterodine, Antihistamines, Antipsychotics (e.g., low potency neuroleptics such as chlorpromazine), Promotility agents, Tricyclic antidepressants (especially amitriptyline, imipramine, and doxepin), Cumulative effect of multiple medications with anticholinergic effects **Histamine-2 Blocking agents:** Cimetidine **Anticonvulsants:** Phenytoin, Phenobarbitone **Antiparkinsonian medications:** Dopamine agonists, Levodopa-carbidopa, Amantadine, Anticholinergics, Benztropine **Use of more than three medications**
Laboratory Findings: High urea/Creatinine ratio, Hypo/Hypernatremia, Hypo/hyperkalemia, Hypoxia, hepatic failure
Surgery and Anaesthesia: Unplanned (i.e., emergency) surgery, Immobility after surgery, preoperative use of narcotic analgesics, type of surgery (hip replacement surgery, neurosurgery), emergency surgery, longer duration of surgery, type of anesthetic, postoperative pain, intraoperative blood loss
Pain: poor pain management
Nutrition: Malnutrition, dehydration, hypoalbuminemia
Treatment-related factors: use of physical restraints, indwelling Cather, High number of procedures during early hospitalization (X-rays, blood tests, etc.)
Sleep: sleep deprivation/insomnia
Treatment setting: Intensive care units, longer duration of hospital stay
Others: Alcohol abuse, Urgent hospitalization, frequent hospitalizations

Table-6: Etiology of catatonia among elderly reported in the form of case reports (adapted from Jaimes-Albornoz et al., 2022)

Neurologic:
- **Dementia:** Alzheimer's dementia, Frontotemporal dementia, Lewy bodies dementia, Mixed
- Dementia, dementia not otherwise specified
- **Epilepsy:** non-convulsive status epilepticus
- **Cerebrovascular disease**
- **Encephalitis:** NMDA Encephalitis, para-neoplastic encephalitis, anti-Hu encephalitis, viral encephalitis
- Parkinson's disease
- **Cerebral anoxia/hypoxia**
- **Creutzfeldt-Jakob's disease**
- **Epidural empyema**
- **Frontotemporal lobes atrophy**
- **Cerebral Whipple's disease**
- **Progressive supranuclear palsy**
- **Intellectual disability**
- **Frontal lobe syndrome**
- **Hypothermia, frontal lobotomy**
- **Occipital brain tumor**
- **Atrophy of the brainstem and cerebellar vermis**

Metabolic:
- **Organ failure:** Acute renal failure, Heart failure, Liver failure
- **Post liver transplantation**
- **Dehydration**
- **Electrolyte disturbances:** Hyponatremia, Hypernatremia
- **Infectious:** Urinary tract infection, Pneumonia, COVID-19 infection
- **Endocrine:** Hyperparathyroidism, Hypothyroidism, Hyperthyroidism
- **Others:** B12 deficiency, Pernicious anemia
- **Malignancy:** Cancer of the colon

Medications
- **Antipsychotics:** Haloperidol, Droperidol, Loxapine, Pipotiazine, Trifluoperazine, Tiapride, Aripiprazole, Risperidone, Quetiapine
- **Other medications:** Phenelzine, Allopurinol, Prednisone, Rivastigmine, Donepezil, Azithromycin, Cefepime, Amiodarone, Tacrolimus, Methotrexate, Imiquimod
- **Medication Withdrawal:** Nitrazepam, diazepam, alprazolam, oxazepam, temazepam, clonazepam, chlordiazepoxide, lorazepam, clozapine, olanzapine, risperidone, chlorpromazine, levomepromazine, bromperidol, haloperidol, cyamemazine, Amantadine, lithium, gabapentin
- **Toxic substances:** Manganese

Table-7: Causes of Agitation (Grover & Singla, 2018, CLP Book)

| General medical condition	- Delirium - Metabolic derangements (e.g., hypoglycemia, hyponatremia, hypocalcemia) - Hypoxia - Thyroid disease - Environmental toxins
Surgical conditions	- Head injury - Severe burns - Major surgical intervention in recent times - Postoperative period (especially among the elderly)
Neurological illnesses	- Intracranial mass or hemorrhage - Stroke - Infection (e.g., meningitis, encephalitis) - Seizures (post-ictal phase) - Dementia
Toxicity	- Anticholinergic intoxication - Antiepileptic medications - Stimulants - Steroid psychosis - Serotonin syndrome - Neuroleptic malignant syndrome - Alcohol intoxication/withdrawal
Psychiatric Disorders	- Psychotic disorder - Mood disorders - Dementia - Anxiety disorder - Personality disorder - Acute stress reaction/ adjustment disorder
Medication side effects	Akathisia

Table-8: Distinguishing features between agitation due to primary psychiatric disorder and agitation due to underlying medical condition (Grover & Singla, 2018, CLP Book)

	Primary Psychiatric Disorder	Underlying Medical Condition
Onset of Agitation	Gradual	Sudden
Past Psychiatric History	Present	Absent
Vital Signs	Usually, normal	Usually, abnormal
Physical Examination	Usually, normal	Usually, abnormal
Type of hallucination	Mostly Auditory	Visual > Auditory
Emotional state	Flat, cheerful, sad	Emotional Lability
Attention & Concentration	Usually, intact	Often Impaired
Level of consciousness	Usually, alert	Often impaired, fluctuations

Management

The primary goals of emergency assessment and management include triage and prioritizing elderly care, diagnostic clarification, clinical stabilization, ensuring the safety of the patient, de prescription and prescription, non-pharmacological measures, briefing the family members and patient, monitoring the progress, and deciding about the treatment setting (inpatient-psychiatry/medical-surgical ward, intensive care unit, outpatient care), as emergency care is usually transit care (Figure-3). However, it is essential to remember that these measures are carried out almost simultaneously rather than sequentially.

Figure-3: Principles of management of patients in emergency
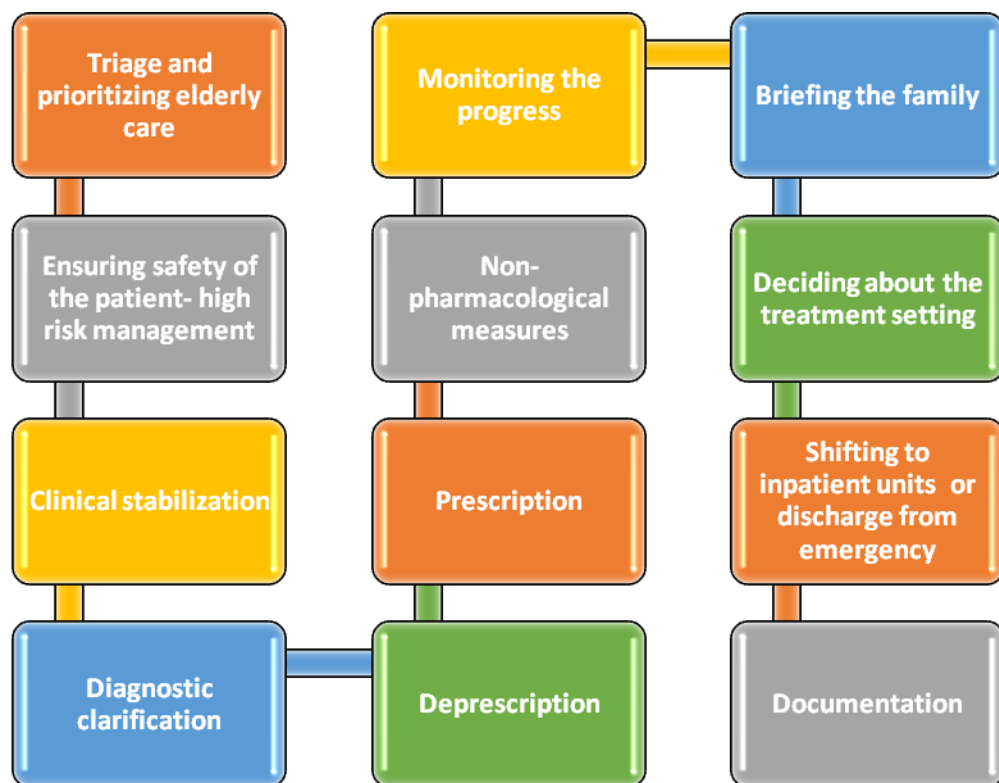
Triage and prioritizing elderly care: Some of the issues that should be kept in mind while evaluating and managing an elderly patient in an emergency include reducing the waiting time, ensuring physical comfort of the patient, reducing the external stimuli, and, if possible, managing the elderly in an isolation room, and ensuring that there are no potentially dangerous objects in the treatment setting.

Ensuring the safety of the patient: Patients with self-harm should be monitored closely, and high-risk management should be instituted, attempts should be made to medically stabilize these patients, and as per the need, they should be shifted to the psychiatry inpatient facility

or transferred/referred to the nearest psychiatric facility. Those patients requiring monitoring for the physical health consequences should be shifted to the medical-surgical wards or intensive care units as per the need.

Physical Stabilization: An essential aspect of managing patients in the emergency setting is physical stabilization, which is often done alongside assessment or, at times, may have to be done only after preliminary examination due to life-threatening presentation. For clinical stabilization, first importance should be given to the airway, breathing, and circulation stabilization. The physician rather than the psychiatrist should primarily do this. However, during this process, psychiatrists can provide their input to manage various psychiatric manifestations, mainly to address conditions that may impede or disrupt the achievement of physical stability—for example, managing delirium and agitation so that patient remains cooperative for treatment.

Diagnostic clarification: it is an essential step in managing the patient. A high index of suspicion is required to rule out all the suspected causes of the clinical presentation. It is also crucial to remember that often elderly patients with psychiatric disorders do not receive proper health evaluation from time to time and may have undetected physical illnesses. Hence, depending on the clinical presentation, additional investigations may be considered. Often elderly patients who are brought to an emergency are on many medications, and the psychiatric presentation may be related to the medication's intoxication, withdrawal, or side-effect. Hence, clinicians often face the dilemma of which drugs to continue or discontinue. It is crucial to remember that sudden withdrawal of medications in patients on psychotropics can lead to complications (for example, seizure), and continuation of agents responsible for the clinical presentation can lead to progression and mortality. In this regard, clinicians need to understand the basic principles of deprescription.

Deprescribing: It is understood as a systematic process of recognizing, reducing the doses of medications, or stopping/replacing the medicines when the current and potential risks of continuing the drugs outweigh the current or potential benefits by considering the patient's medical morbidity, functioning, values, and preferences. The final aim of the process is not necessarily to stop the medications entirely but is judicious use of drugs (Scott et al., 2015; Gupta & Cahill, 2016). This process has been primarily understood in the context of elderly outpatients, and medication withdrawal is made stepwise. However, in an emergency, such a stepwise stoppage of medications may or may not be possible. But the basic principles and steps (Table-9) can also help deprescribe in an emergency. The first step in the process of deprescribing is to obtain a comprehensive medication history. Rather than limiting to

reviewing the prescription, asking the patient/caregivers to show all the medications the patient is taking is better. This can provide important information about the prescription medications and over-the-counter (OTC), complementary/alternative medicine agents, and wrong medications (prescribed one medication but dispensed something else). Each drug should be evaluated for its potential to be reduced in dose or discontinued, or profound adverse effect (hyponatremia, upper gastrointestinal bleeding) is suspected, and the medication should be stopped immediately. When the patient is medically unstable, and on psychotropics, a decision about stopping and continuing should be based on the current severity of medical instability impact of continuing psychotropics on current clinical presentation (for example, to continue benzodiazepine or opioids in patients with respiratory difficulty) and risk involved with abrupt discontinuation of the medication.

Table-9: Principles and Steps to Deprescribe (*Steinman & Reeve, 2021; Scott et al., 2013*)

When to consider deprescription?
- Polypharmacy (receiving >5 medications)
- Multimorbidity
- Renal Impairment
- Multi-prescribers & transient care
- Medication non-adherence
- Limited life expectancy
- Older age
- Frailty
- Dementia

How to decide which to stop?
- Review all medications
- Estimate life expectancy
- Define care goals
- Verify current indications
- Determine the need for preventative care
- Determine benefit-harm of medications
- Is the medication use responsible for clinical presentation- Toxidromes
- Is the clinical presentation due to withdrawal of medication?

Which medication to deprescribe- Identify the drug to deprescribe
- Have no valid or current indication
- Responsible for or contributing to the clinical presentation
- Were started as a result of a prescribing cascade, a situation in which one medication is started to treat a side effect of another medication
- Are generally high risk in the elderly population (e.g., anticholinergics in older adults)
- Are ineffective
- Are used for a preventive indication in a patient receiving palliative care (e.g., bisphosphonates)

- Cause unacceptable treatment burden (e.g., insulin in a person with dementia who is fearful of needles)

Planning & Implementing Deprescribing
- Prioritize drugs for discontinuation and plan the order of discontinuation
- Medications that are causing (or have a high risk of causing) harm, and those which are of most significant concern to the patient, should be stopped first
- Stop one drug at a time, however, in case an adverse drug reaction is suspected, or if there is minimal risk of an adverse drug withdrawal reaction, two or more drugs can be withdrawn simultaneously
- Tapering is recommended where there is the risk of adverse drug withdrawal reactions or if there is concern that the underlying condition will return or worsen
- Decide about the frequency of monitoring

It is essential to consider these four critical points when developing a deprescribing plan:
- How severe is the toxicity/risk to the patient about continuing the medication
- How long the patient has been taking the medication (particularly a concern for benzodiazepines)
- Dose and half-life of the drug in question
- The likelihood of developing an Adverse Drug withdrawal reaction
- Discuss the plan with the primary physician and family (also with the patient, if the patient is in a position to participate in such an interaction)

Important things to remember:
- Monitor the patient closely for potential withdrawal reactions
- If there is any doubt about whether a medication can be stopped abruptly, it is safer to taper the dose over weeks to months.

Follow-up
- Develop a plan for monitoring and assessment

A similar situation arises when a patient on psychotropic medications with a medical-surgical emergency requiring urgent surgery is referred to a psychiatrist for continuing or stopping the ongoing psychotropic medications. Essential aspects to be considered while providing clearance for surgery are the impact of sudden withdrawal of psychotropic drugs (medical withdrawal syndromes and adverse effects), the impact of stopping psychotropics on the course of illness for which the psychotropics were recommended earlier, the type of surgery, drug interactions between psychotropics and the anesthetic agents, the impact of psychotropics on recovery from general anesthesia, impact of psychotropics on the new or old medical illness which has currently got destabilized, impact of the continuation of psychotropics on an increased risk of bleeding (Huyse et al., 2006). Another aspect of an emergency is deciding about surgical clearance of an elderly patient presenting with a history of using the substances in recent times that could be a few hours or a few days back.

There is a lack of literature on these aspects, especially concerning the emergency setting or surgery. However, the data and recommendations for routine surgery can also be considered for the emergency. From a surgical point of view, the American Society of Anaesthesiology (ASA) divide the different group of patients into six categories and tend to make recommendations for the continuation and stoppage of varying class of medications. ASA, category-1 includes healthy patients (those who are fit, non-obese, are non-smokers, and have good exercise tolerance). ASA category-2 includes subjects with mild systemic diseases (i.e., patients with no functional limitations and have well-controlled conditions, e.g., treated hypertension, obesity with BMI < 35 kg/meter^2, frequent social drinker or cigarette smoker). Patients in ASA category-3 include patients with severe systemic disease that is not life-threatening.

In contrast, ASA category-4 includes patients with a severe systemic disease that constantly threatens the patient's life. ASA category-5 includes moribund patients who may not survive without an operation, and ASA category-6 includes brain-dead patients. Most of the patients for whom psychiatrists are consulted in an emergency are in ASA category-4 or more. Further, it is important to note that all psychiatric patients, who are on psychotropics are in general considered to be belonging to ASA catergory-3 or above.

In general, stoppage of antipsychotics other than clozapine is not recommended before surgery. Concerning antidepressants, the general recommendations are to stop antidepressants for patients belonging to ASA class-III-VI. Mono-amine oxidise inhibitors (MAOIs) need to be stopped in all patients. In terms of mood stabilizers, lithium needs to be stopped, whereas valproate and carbamazepine can be continued (Hyuse et al., 2006; Peck et al., 2010; Harbell et al., 2021). However, it is essential to understand in elective surgeries, the clinicians may have enough time to stop the medication and allow it to wash out, but the same may not be accurate for patients in the emergency. Hence, the psychiatrists should discuss the possible risks with the surgeon and anesthetists (Table-10). Available literature with regard to benzodiazepines suggests that these can be continued. The patients taking opioids, such as Buprenorphine and methadone, and requiring emergency surgery should be continued and given additional analgesics to manage pain (Table-11). The patients who have been taking alcohol till recent times and experiencing withdrawal or are likely to experience withdrawal can be advised benzodiazepine during the perioperative periods. An important fact here to remember is that if a patient is experiencing alcohol withdrawal and requires surgery, the psychiatrists can discuss the possibility of using propofol and ketamine for anesthesia as these drugs are recommended for the management of alcohol withdrawal too. However, it is

essential to remember that if these agents are used, the withdrawal can start slightly later in the postoperative period and require appropriate management (Table-11). The use of thiamine in patients with alcohol withdrawal should not be forgotten.

Table-10: Psychotropics during the perioperative period (Hyuse et al., 2006; Peck et al., 2010; Harbell et al., 2021)

Medication class	General recommendations	Information to be communicated to the Surgeon/Anaesthesia team	Psychiatric follow-up
Antipsychotics	• Can be continued except for clozapine	• To check the drug interaction between the ongoing medications and anesthetic medications, and other medicines to be used during the perioperative period • Stoppage of first-generation antipsychotics can lead to cholinergic rebound • Continuation of Second-generation antipsychotics can lead to serotonin syndrome • Review and monitor ECG before, during, and after surgery	•

Antidepressants	• MAOIs to be stopped
	  • Irreversible MAOI—discontinue two weeks before surgery
	  • Reversible MAOI—discontinue on day of surgery
	  • Discontinue 24 h before surgery
	• Other antidepressants can be continued only in healthy persons (ASA class-I) and those with mild systemic disease (ASA class-II); for other categories (ASA class-III-VI), antidepressants should be stopped
		If there is a lack of time to stop the medications, the anesthesia and surgical team should be informed about the risk of
		• Serotonin syndrome (especially if the patient is prescribed opioids (such as meperidine, methadone, fentanyl, Tramadol), ondansetron, metoclopramide, metronidazole
		• TCAs may interact with sympathomimetics- leading to a rise in blood pressure; TCA, when used with enflurane and desflurane, can lead to seizures; Drug interactions at Cyp450, SSRIs may interact with type-1antiarrhymic agents
		• Venlafaxine can increase the risk of hypertension
		• Risk of excessive bleeding during the surgery while using SSRIs and SNRIs (should be stopped in patients with high-risk bleeding)
		• If stopped – monitor for withdrawal symptoms
			• Monitor for relapse of primary psychiatric illness
			• Monitor for withdrawal symptoms in case the medications are stopped
			• Monitor for emergence of postoperative delirium

		for short-acting SSRIs and cholinergic rebound in patients receiving TCAs	
Mood stabilizers	• Lithium should be stopped 72 hours before surgery • Valproate and Carbamazepine can be continued	• Lithium continuation can prolong neuromuscular blockade • Carbamazepine is an inducer of the cytochrome P450 system and can reduce the effect of other drugs • Valproate can interfere with platelet functioning • Valproate is highly protein-bound, so it can increase the free concentration of high plasma-protein-bound drugs like propofol	• Monitor for relapse of primary psychiatric illness
Benzodiazepines	• Can be continued	• It can lead to sedation • Stoppage can lead to withdrawal symptoms	• Monitor for relapse of primary psychiatric illness in case it is stopped • Monitor for withdrawal symptoms in case the medications are stopped • Monitor for emergence of postoperative delirium

Table-11: Managing substance withdrawal during the perioperative period (Sritapan et al., 2020; Ungur et al., 2020)

Substance	Information to be communicated to the Surgeon/Anaesthesia team
Alcohol (Ungur et al., 2020)	• Start Thiamine • If urgent surgery is required and there is no time to detoxify, discuss possible use of propofol during the surgery • Use symptom-triggered intravenous benzodiazepines (Lorazepam if there is hepatic decompensation; diazepam, if there is no hepatic dysfunction) in increasing doses, before or after the surgery • If no or partial response to benzodiazepines- consider clonidine, dexmedetomidine, Baclofen, ketamine, and neuroleptics as a symptom-orientated adjunct

Opioids (Sritapan et al, 2020)	• Substitution therapy with Tramadol for the patient using illicit opioids
	• For patients on Buprenorphine-
	  ✓ Using a low dose of Buprenorphine (2-8 mg per day)- can continue Buprenorphine as an analgesic, and the dose can be increased every 6-8 hours
	  ✓ For patients who are not able to tolerate sublingual Buprenorphine, it can be discontinued 72 hours before surgery and replaced with a full mu-opioid agonist for pain management
	  ✓ If the risk of relapse is high, then replace Buprenorphine with methadone and titrate upwards to achieve adequate pain control
	  ✓ Consider additional regional anesthesia if this is feasible and multimodal analgesic combinations (clonidine, ketamine, dexmedetomidine, and remifentanil)and to target pain pathways at different sites to provide superior pain relief and decreased opioid consumption
	  ✓ Methadone-continue with the same. Consider additional regional anesthesia if this is feasible and multimodal analgesic combinations (clonidine, ketamine, dexmedetomidine, NSAIDs, and remifentanil) and to target pain pathways at different sites to provide superior pain relief and decreased opioid consumption
	• Inform the anesthesia team about the use of substitution therapy and a patient being dependent on opioids

Prescribing: The prescribing (starting new medication) in the emergency in the elderly is influenced by the type and severity of the psychiatric condition for which psychotropics are being considered, the presence of alternative treatment other than psychotropics (crisis intervention, supportive psychotherapy), comorbid medical illnesses, the severity of the comorbid physical diseases (patient receiving palliative care, moribund patient, the severity of condition suggests that patient is unlikely to survive), and risks and benefits of prescribing a psychotropic. In general, it is better to avoid psychotropics whenever the risk of using a psychotropic outweighs the benefit. If psychotropics have to be prescribed, the general principles of prescribing among the elderly should be kept in mind (Table-12).

Table-12: General Principles for prescribing among elderly

- Start low, go slow
- Baseline investigations: must
- Review medical history & Prescriptions, including the over-the-counter medications
- Substance use history, including the last use, quantity used, etc
- Review the anticholinergic load before prescribing
- Evaluate for sensory deprivation – consider how it is going to affect the adherence to medications
- Keep the prescription: as simple as possible
- Evaluate the social support- who is going to supervise the medication
- Explain to the patient/caregiver what to do in case of side effect
- Follow-up closely
- If the elderly reports, any new side effects, do not ignore
- Have a good understanding of drug interactions
- Avoid polypharmacy
- Use medications for the shortest possible duration
- Monitor investigations regularly

Non-pharmacological measures: The role of non-pharmacological measures in the emergency should not be underestimated, and all patients/caregivers should be psychoeducation about the diagnostic possibilities being considered and the possible management plan. Depending on the symptoms and/or disorders, specific measures such as verbal de-escalation (agitation) and reorientation cues should be used.

Monitoring the progress: In the emergency setting, it is essential to maintain continuous vigilance in the emergency setting for elderly patients presenting with psychiatric emergencies because the condition can at times deteriorate rapidly. As per the need, the input and output charting should be maintained, and vitals should be monitored. Similarly, clinicians should continuously monitor mental status examinations. Depending on the progress, the physician and psychiatrist should be open to shifting the patient's responsibility to be the primary person responsible for the patient's care.

Briefing the family from time to time about the progress: This is one of the most important steps of managing patients in an emergency. However, this is often neglected. Briefing the family members about the patient's progress from time to time, concerning the severity of illness, current complications, possible time required for recovery, and chances of survival is of paramount importance. This can prevent violence against the treating team in case of an adverse outcome and help the family members about shifting the patient to another hospital or taking the terminally ill patient home.

Deciding about the treatment setting: This process should start after the initial evaluation of an elderly patient, and efforts should begin to determine what kind of setting (medical

wards, surgical wards, intensive care units, psychiatry ward, etc.) would be suitable for the patient and liaison should start with the concerned teams for shifting the patient to the appropriate setting. Depending on the location being considered, the patient should be stabilized to such an extent that he can be safely managed in such a setting. Before considering shifting the patient to the psychiatry ward, the patient must be medically and surgically stable. The basic principle to remember that patient should be managed in an emergency for the shortest possible time. Suppose the patient requires inpatient care and due to the non-availability of a bed, the patient cannot be shifted to an inpatient ward or intensive care unit. In that case, the family should be allowed to shift the patient to another treatment setting.

Shifting to inpatient units: While shifting the patient to the inpatient unit, it is crucial to ensure the patient's safety. All the relevant documents must be handed over to the treating team taking over the patient. The new team should be informed if the results of any investigations are pending.

Documentation: In emergency settings, people often work in shifts, and there is a change in the psychiatrists and physicians from one transition to the other. Hence, it is paramount to carefully document history and findings at the baseline and subsequently update them so that the clinicians later managing the patient are aware of the patient's findings and progress. As in emergency, patient is managed by a multidisciplinary team, use of specialty specific abbreviations must be avoided.

Discharge of patients: Patients who do not require inpatient care and can be managed on outpatient basis, should be discharged from the emergency after initial stabilization. However, they should be provided clear instructions about when and where to follow-up for further continuation of the care. Depending on the institutional policies, the patient can be followed-up by the same team or another team.

Management of specific Psychiatric emergencies

Management of various specific psychiatric emergencies has been addressed in different guidelines published by the Indian Psychiatric Society in the past or as part of this issue. Hence, these are not discussed in detail here. However, a brief outline is provided here (Table-13) for the conditions that have been addressed earlier, and the readers can refer to previously published documents for detailed understanding.

Table-13: Managing specific Psychiatric emergencies among the elderly

Clinical Condition	Assessment	Management	Further Reading
1. Delirium	- Confirm the diagnosis - Look for risk factors and precipitating factors- detailed physical examination, review the medical history and check the ongoing medications, investigate to understand the cause of delirium - Rate the severity of delirium - Electrocardiogram - Arterial Blood Gas Analysis - Input/output charting	- Ensure the safety of the patient - Reorientation cues, supportive measures - Provide unambiguous environment - Maintain competence - Stop the offending agent, correct the underlying metabolic abnormality and other underlying cause(s) - Educate the family about the condition: nature, symptoms, and their role in the management - Monitor the patient's clinical status - Use pharmacological agents (antipsychotics, melatonin, dexmedetomidine) in the lowest possible dose for the shortest possible duration- document the reason for considering the pharmacological agent - While using antipsychotics, get the baseline ECG and monitor the same - Mobilize the patient at the earliest	Grover S, Avasthi A. Clinical Practice Guidelines for Management of Delirium in Elderly. Indian J Psychiatry. 2018 Feb;60(Suppl 3):S329-S340.
2. Delirium Tremens	- Confirm the diagnosis - Assess the last intake, including any reduction in recent time, type of alcohol consumed - History of falls, seizures - Evaluate for nutritional deficiencies - If a head injury is suspected- neuroimaging - Electrocardiogram - Arterial Blood Gas Analysis - Input/output charting	- Ensure the safety of the patient - Manage fluid imbalance, electrolyte levels, nutritional issues - If intravenous fluids are administered, thiamine should be given before glucose is administered to prevent precipitation of Wernicke's encephalopathy - Use magnesium sulphate if the patient has hypomagnesemia, as in the presence of hypomagnesemia, thiamine is ineffective - Thiamine 500 mg IV three times daily for 2-to-3 days and 250 mg IV daily for the next 3-to-5 days given as an infusion over 30 min, diluted in 50–100	Grover S, Avasthi A. Clinical Practice Guidelines for Management of Delirium in Elderly. Indian J Psychiatry. 2018 Feb;60(Suppl 3):S329-S340.

		ml of normal saline	
		• Thiamine 100 mg orally thrice daily for the rest of the hospital stay and during outpatient treatment.	
		• Monitor vitals	
		• Avoid physical restraints, if possible, as the patient may fight them and cause injury	
		• Follow the other measures for delirium	
		• Monitor the patient to avoid any kind of complication and manage the same	
		• Lorazepam 2 mg or diazepam 10mg (orally/IV), repeat till the symptoms clear- preferably use the symptom trigger method rather than front loading	
		• Total doses given on the first day should be the standing dosage given on the second day, then it should be tapered gradually over 3 to 4 days	

3. Agitation	• Evaluate the risk factors and cause(s) of agitation- consider the possibility of underlying organic cause, even if the patient is known to have a psychiatric disorder
	• Further assessment as per the etiology
	• The routine investigation, including arterial blood gas analysis
		• Ensure the safety of the patient
		• Environmental Manipulation
		  ✓ Ensure the physical comfort of the patient
		  ✓ Decrease the external stimuli and isolation (a quiet separate room)
		  ✓ Remove all such objects in the surrounding that can be potentially dangerous
		  ✓ Minimize the waiting period
		  ✓ Monitor how staff members approach the patient
		  ✓ Verbal De-escalation
		• Verbal de-escalation
		• Pharmacological management: when verbal de-escalation does not work
		• Pharmacological measures: oral/intravenous/intramuscular antipsychotics or benzodiazepines
		• Management of underlying cause
			Raveesh BN, Munoli RN, Gowda GS. Assessment and Management of Agitation in Consultation-Liaison Psychiatry. Indian J Psychiatry. 2022 Mar;64(Suppl 2):S484-S498.

4. Catatonia	• Evaluate the cause
	• Assess for all possible organic etiologies
	• Investigate as per the suspected etiology
	• Evaluate the treatment history-type of medications, adherence
	• Rate the severity of catatonia using the Bush Francis Catatonia Rating scale (BFCRS)
	• Monitor nutritional status, complications
	• Electrocardiogram
	• Arterial Blood Gas Analysis
	• Input/output charting
		• Supportive measures
		• Lorazepam Challenge Test (Sienaert et al, 2014)
		  ✓ Baseline BFCRS rating
		  ✓ 1-2 mg of lorazepam intravenously
		  ✓ Review after 5 minutes
		  ✓ If there is no change- repeat the second dose of lorazepam and evaluate after 5 minutes (if the lorazepam is given intramuscularly or orally, the second dose should be repeated after 15 minutes and the final evaluation to be done at 30 minutes)
		  ✓ >50% reduction in BRCRS: positive Lorazepam challenge test
		• Treat the underlying medical and psychiatric condition	

5. Dementia with Behavioural and psychological symptoms of dementia (BPSD)	• Confirm the diagnosis of dementia • Assess the type and severity of the BPSD • Assess the medical and psychiatric comorbidity • Assess for complications from BPSD (for example, head injury, nutritional issues, interpersonal issues, etc.) • Assess the caregiving pattern and environmental factors contributing to the onset or worsening of BPSD • Rule out superimposed delirium, pain, bladder, and bowel-related issues, sensory deprivations • Electrocardiogram • Arterial Blood Gas Analysis	• Psychoeducation of the caregivers • Manage pain, bladder and bowel-related issues, sensory deprivations- if these can be modified • Suggesting environmental modifications- suggest changes to modifiable factors contributing to BPSD • Explain to the caregivers about un-modifiable risk factors • Provide comfort to the patient • Discuss the use of non-pharmacological measure • Consider pharmacological measures for the short term- depending on the severity of BPSD, physical comorbidities, medical stability	Shaji KS, Sivakumar PT, Rao GP, Paul N. Clinical Practice Guidelines for Management of Dementia. Indian J Psychiatry. 2018 Feb;60(Suppl 3):S312-S328.

	• Input/output charting		
6. Suicidality	• Assess the severity of suicidality • Assess for the predisposing and precipitating factors – detailed psychosocial assessment • In case a patient presents with a suicidal attempt- evaluate the medical stability, lethality of the attempt, intent of attempt, planning before the attempt, current suicidal ideation, and planning • Assess for underlying psychiatric and medical morbidities • Rate the severity of suicidal behavior • Assess for future risk of suicidal behavior	• High-risk management • Crisis intervention as per the need • Physical stabilization of the patient • Treat the underlying psychiatry disorder • Address the associated psychosocial factors • Assess the need for psychiatry inpatient care	CPGs on Suicidal behavior
7. Depression	• Assess the severity of depression, suicidality, comorbid physical diseases, and psychiatric disorders • Carefully rule out bipolar disorder • Consider the organic etiologies for depression • Assess nutritional status, undiagnosed medical illnesses, frailty, nutritional deficiencies, and current nutritional status • Assess current and past treatment history • Assess for psychosocial stressors • Routine investigations and others as per the need • Assess the level of cognitive	• Decide about treatment setting- decide about the need for inpatient care • Psychoeducation of patients and caregivers • High-risk management as per the requirement • Pharmacological management of depression based on the severity of depression, history, comorbid physical diseases, psychiatric comorbidity, and past treatment history • If the patient is a candidate for somatic treatment (i.e., electroconvulsive therapy)- consider inpatient care • Address the psychosocial issues, provide crisis intervention if required • Supportive psychotherapy	Avasthi A, Grover S. Clinical Practice Guidelines for Management of Depression in Elderly. Indian J Psychiatry. 2018 Feb;60(Suppl 3):S341-S362.

	functioning • Assess for future risk of harm • Assess for caregiver-related issues • Evaluate the need for somatic treatment, such as electroconvulsive therapy		
8. Psychosis	• Ascertain the type of psychosis • Assess the severity of psychosis, suicidality, comorbid physical diseases, and psychiatric disorders • Consider the organic etiologies for psychosis • Assess nutritional status, undiagnosed medical illnesses, frailty, nutritional deficiencies, and current nutritional status • Assess current and past treatment history • Assess for psychosocial stressors • Routine investigations and others as per the need • Assess the level of cognitive functioning • Assess for future risk of harm • Assess for caregiver-related issues	• Decide about treatment setting- decide about the need for inpatient care • Psychoeducation of patients and caregivers • High-risk management as per the requirement • Pharmacological management for psychosis based on the severity of psychosis, history, comorbid physical diseases, psychiatric comorbidity, and past treatment history • Address the psychosocial issues • Supportive psychotherapy	Gautam S, Jain A, Gautam M, Gautam A. Clinical Practice Guideline for Management of Psychoses in Elderly. Indian J Psychiatry. 2018 Feb;60(Suppl 3):S363-S370.
9. Substance withdrawal/ intoxication	• Assess the last intake, including any reduction or increase in the recent time, type of substance consumed • Assess the dose of last intake, time of the last intake • History of falls, seizures	• Supportive measures • Monitor cardio-respiratory status – if required, supportive ventilation • Opioid Intoxication- use Naloxone • Opioid withdrawal- substitution therapy • Symptomatic management	CPG for substance intoxication

	• Evaluate for other medical complications • If a head injury is suspected- neuroimaging • Electrocardiogram • Arterial Blood Gas Analysis • Input/output charting • Confirm the diagnosis	• Brief intervention	

10. Toxidromes	• Confirm the diagnosis- consider the symptoms and signs and investigation findings
	• Assess for risk factors and precipitating factors
	• Focus on the type of medication used, any recent change in the drugs in terms of doses, time of starting of drugs, and addition of any new drug to the prescription
	• Assess the last intake of medication
	• Assess for current medical complications and comorbid medical illnesses
	• Rule out other differential diagnoses
		• Stop the offending agent
		• Supportive measures
		• Monitor cardio-respiratory status – if required supportive ventilation
		• Monitor input and output
		• Prevent complications
		• Use antidote (use depending on the severity)
		  ✓ NMS: Bromocriptine, Amantadine, dantrolene, Dopamine agonists (Levo/carbidopa); Benzodiazepines for supportive care
		  ✓ Serotonin syndrome: Cyproheptadine
		  ✓ Anticholinergic syndrome: Physostigmine
			Grover S, Sarkar S, Avasthi A. Clinical Practice Guidelines for Management of Medical Emergencies Associated with Psychotropic Medications. Indian J Psychiatry. 2022 Mar;64(Suppl 2):S236-S251.

11. Medication withdrawal	• Confirm the diagnosis- review the treatment history carefully for the intake of medications in terms of stopping medications or reduction in the doses of medications • Rule out other differential diagnoses	• Supportive measures • Monitor cardio-respiratory status – if required, supportive ventilation • Monitor input and output • Prevent complications • Restart the medications which have led to the withdrawal • Restarting should be done based on the information	

		about the previously prescribed doses, and time since the last intake, and recommended starting schedule for the medication	

12. Medication overdose	• Confirm the diagnosis- consider the symptoms and signs
	• Focus on the type of medication(s) consumed
	• Assess the time of intake of drug (s)
	• Assess for current medical complications and comorbid medical illnesses
	• Rule out other differential diagnoses
		• Stop the offending agent
		• Supportive measures
		• Monitor cardio-respiratory status – if required, supportive ventilation
		• Monitor input and output
		• Prevent complications
		• Use specific measures (use depending on the severity)
		  ✓ Lithium toxicity: gastric lavage, dialysis
		  ✓ Valproate toxicity: gastric lavage
		  ✓ Carbamazepine toxicity: gastric lavage, hemodialysis, charcoal hemoperfusion, intravenous lipid emulsion, and venovenous hemodiafiltration
		  ✓ Benzodiazepine overdose: flumazenil
		  ✓ Antidepressants and antipsychotic overdose: supportive measures
			Grover S, Sarkar S, Avasthi A. Clinical Practice Guidelines for Management of Medical Emergencies Associated with Psychotropic Medications. Indian J Psychiatry. 2022 Mar;64(Suppl 2):S236-S251.

13. Severe systematic complications due to the use of psychotropics	• Confirm the diagnosis- consider the symptoms and signs • Requires a high index of suspicion • Assess for current medical complications and comorbid medical illnesses • Rule out other differential diagnoses	• Stop the offending agent • Supportive measures • Monitor cardio-respiratory status – if required, supportive ventilation • Monitor input and output • Prevent complications • Manage as per the recommended guidelines for the systemic emergency	Grover S, Sarkar S, Avasthi A. Management of Systemic Medical Emergencies Associated with Psychotropic Medications. Indian J Psychiatry. 2022 Mar;64(Suppl 2):S252-S280.
14. Crisis interventions	• Assess the psychosocial crisis and its	• Supportive care	

	significance of the same for the elderly • Assess the social support, coping ability • Assess psychiatric and medical morbidity	• Crisis intervention	
15. Anxiety syndromes	• Assess the severity of anxiety • Assess the possible underlying medical illnesses and current presentation being worsening of physical illnesses, rather than this being a psychiatric presentation • Assess for organic etiology for the anxiety, if this is not an indicator of worsening of organic illness • Evaluate for psychosocial stressors and other factors which could lead to anxiety (for example, being informed about cancer or any other life-threatening illness)	• Supportive care • If the organic causes and anxiety as a manifestation of worsening of physical illness has been ruled out-consider anxiety disorder • Psychoeducation • Low dose benzodiazepines sos	Subramanyam AA, Kedare J, Singh OP, Pinto C. Clinical practice guidelines for Geriatric Anxiety Disorders. Indian J Psychiatry 2018;60:371-82.

References:

- *Violan C, Foguet-Boreu Q, Flores-Mateo G, Salisbury C, Blom J, Freitag M, Glynn L, Muth C, Valderas JM. Prevalence, determinants and patterns of multimorbidity in primary care: a systematic review of observational studies. PLoS One. 2014 Jul 21;9(7):e102149.*

- *Fortin M, Stewart M, Poitras ME, Almirall J, Maddocks H. A systematic review of prevalence studies on multimorbidity: toward a more uniform methodology. Ann Fam Med. 2012 Mar-Apr;10(2):142-51.*

- *The Academy of Medical Sciences. Multimorbidity: a priority for global health research. Academy of Medical Sciences, 41 Portland Place, London, W1B 1QH, 2018.*

- *de Lima JD, Teixeira IA, Silva FO, Deslandes AC. The comorbidity conditions and polypharmacy in elderly patients with mental illness in a middle income country: a cross-sectional study. IBRO Rep. 2020 Jul 16;9:96-101.*

- *Samaras N, Chevalley T, Samaras D, Gold G. Older patients in the emergency department: A review. Ann Emerg Med 2010;56:261-9.*

- *Shah MN, Bazarian JJ, Lerner EB, Fairbanks RJ, Barker WH, Auinger P, et al. The epidemiology of emergency medical services use by older adults: An analysis of the national hospital ambulatory medical care survey. AcadEmerg Med 2007;14:441-7.*

- *Keskinoğlu P, Inan F. Analysis of emergency department visits by elderly patients in an urban public hospital in Turkey. J Clin GerontolGeriatr2014;5:127-31.*

- *Legramante JM, Morciano L, Lucaroni F, Gilardi F, Caredda E, Pesaresi A, Coscia M, Orlando S, Brandi A, Giovagnoli G, Di Lecce VN, Visconti G, Palombi L. Frequent Use of Emergency Departments by the Elderly Population When Continuing Care Is Not Well Established. PLoS One. 2016 Dec 14;11(12):e0165939.*

- *Dapap DD, Okpataku CI, Audu MD. Use of psychoactive substances among patients presenting at the emergency department of a tertiary hospital. Niger Postgrad Med J. 2020 Jul-Sep;27(3):230-236.*

- *Barron EA, Holmes J. Delirium within the emergency care setting, occurrence and detection: A systematic review. Emerg Med J 2013;30:263-8.*

- *Hussey FM, Meldon SW. The prevalence and documentation of impaired mental status in elderly emergency department patients. Ann Emerg Med 2002;39:248-53.*

- *Naughton BJ, Moran MB, Kadah H, Heman-Ackah Y, Longano J. Delirium and other cognitive impairment in older adults in an emergency department. Ann Emerg Med 1995;25:751-5.*

- *Gerson LW, Counsell SR, Fontanarosa PB, Smucker WD. Case finding for cognitive impairment in elderly emergency department patients. Ann Emerg Med 1994;23:813-7.*

- *Adams WL, Magruder-Habib K, Trued S, Broome HL. Alcohol abuse in elderly emergency department patients. J Am Geriatr Soc 1992;40:1236-40.*

- *Wei Y, Zhao J, Wong IC, Wan EY, Taylor DM, Blais JE, Castle DJ, Knott JC, Tse ML, Chow AT, Chan EW. Relation of substance use disorders to mortality, accident and emergency department attendances, and hospital admissions: A 13-year population-based cohort study in Hong Kong. Drug Alcohol Depend. 2021 Dec 1;229(Pt B):109119.*

- *Grover S, Avasthi A. Clinical Practice Guidelines for Management of Delirium in Elderly. Indian J Psychiatry. 2018;60(Suppl 3):S329-S340.*

- *Grover S, Natarajan V, Rani S, Reddy SC, Bhalla A, Avasthi A. Psychiatric morbidity among elderly presenting to emergency medical department: A study from tertiary hospital in North India. J GeriatrMent Health 2018;5:49-54.*

- *Grover S, Sarkar S, Avasthi A, Malhotra S, Bhalla A, Varma SK. Consultation-liaison psychiatry services: Difference in the patient profile while following different service models in the medical emergency. Indian J Psychiatry. 2015;57:361-6.*

- *Borja B, Borja CS, Gade S. Psychiatric Emergencies in the Geriatric Population. Clin Geriatr Med 2007;23: 391–400.*

- *Rego T &Velakoulis D. Brain imaging in psychiatric disorders: target or screen? BJPsych Open 2019;5:e4, 1–2.*

- *Lippmann S. Emergency brain imaging: CT or MRI? Current Psychiatry, 2013; 12: 55*

- *McCabe JJ, Kennelly S. Acute care of older patients in the emergency department: strategies to improve patient outcomes. Open Access Emergency Medicine 2015:7*

- *Bessey LJ, Radue RM, Chapman EN, Boyle LL, Shah MN. Behavioral Health Needs of Older Adults in the Emergency Department. Clin Geriatr Med. 2018 Aug;34(3):469-489.*

- *Jaimes-Albornoz W, Ruiz de Pellon-Santamaria A, Nizama-Vía A, Isetta M, Albajar I, Serra-Mestres J. Catatonia in older adults: A systematic review. World J Psychiatry 2022; 12(2): 348-367.*

- *Scott IA, Hilmer SN, Reeve E, Potter K, Le Couteur D, Rigby D, et al. Reducing inappropriate polypharmacy: The process of deprescribing. JAMA Intern Med 2015;175:827-34.*

- *Gupta S, Cahill JD. A prescription for "deprescribing" in psychiatry. PsychiatrServ2016;67:904-7.*

- *Steinman M, Reeve E. Deprescribing. Up to date 2021.*

- *Scott IA, Gray LC, Martin JH, et al. Deciding when to stop: towards evidence-based deprescribing of drugs in older populations. Evid Based Med 2013;18: 121-124.*

- *Woodward MC. Deprescribing: Achieving better health outcomes for older people through reducing medications. J Pharm Pract Res 2003;33:323-8.*

- *Huyse FJ, Touw DJ, van Schijndel RS, de Lange JJ, Slaets JP. Psychotropic drugs and the perioperative period: a proposal for a guideline in elective surgery. Psychosomatics. 2006 Jan-Feb;47(1):8-22.*

- *Harbell MW, Dumitrascu C, Bettini L, Yu S, Thiele CM, Koyyalamudi V. Anesthetic Considerations for Patients on Psychotropic Drug Therapies. Neurol Int. 2021 Nov 29;13(4):640-658.*

- *Peck T, Wong A, Norman E. Anaesthetic implications of psychoactive drugs. Contin EducAnaesth Crit Care Pain 2010;10:177–81*

- *Sritapan Y, Clifford S, Bautista A. Perioperative Management of Patients on Buprenorphine and Methadone: A Narrative Review. Balkan Med J. 2020 Aug 11;37(5):247-252.*

- *Under AL, Neumann T, Borchers F, Spies C. Perioperative Management of Alcohol Withdrawal Syndrome. Visc Med. 2020 Jun;36(3):160-166. DOI: 10.1159/000507595.*

- *Sienaert P, Dhossche DM, Vancampfort D, De Hert M, Gazdag G. A clinical review of the treatment of catatonia. Front Psychiatry. 2014 Dec 9;5:181.*

- *Grover S, Avasthi A. Clinical Practice Guidelines for Management of Delirium in Elderly. Indian J Psychiatry. 2018 Feb;60(Suppl 3):S329-S340.*

- *Avasthi A, Grover S. Clinical Practice Guidelines for Management of Depression in Elderly. Indian J Psychiatry. 2018 Feb;60(Suppl 3):S341-S362.*

- *Grover S, Sarkar S, Avasthi A. Management of Systemic Medical Emergencies Associated with Psychotropic Medications. Indian J Psychiatry. 2022 Mar;64(Suppl 2):S252-S280.*

- *Grover S, Sarkar S, Avasthi A. Clinical Practice Guidelines for Management of Medical Emergencies Associated with Psychotropic Medications. Indian J Psychiatry. 2022 Mar;64(Suppl 2):S236-S251.*

- *Gautam S, Jain A, Gautam M, Gautam A. Clinical Practice Guideline for Management of Psychoses in Elderly. Indian J Psychiatry. 2018 Feb;60(Suppl 3):S363-S370.*

- *Raveesh BN, Munoli RN, Gowda GS. Assessment and Management of Agitation in Consultation-Liaison Psychiatry. Indian J Psychiatry. 2022 Mar;64(Suppl 2):S484-S498.*

- *Shaji KS, Sivakumar PT, Rao GP, Paul N. Clinical Practice Guidelines for Management of Dementia. Indian J Psychiatry. 2018 Feb;60(Suppl 3):S312-S328.*

- *Subramanyam AA, Kedare J, Singh OP, Pinto C. Clinical practice guidelines for Geriatric Anxiety Disorders. Indian J Psychiatry 2018;60:371-82.*

Revised
Clinical Practice guidelines for Assessment and Management of Children and Adolescents presenting with Psychiatric Emergencies

I)Introduction

India ranks second in being the most populous country. Every fifth person is an adolescent between 10 and 19 years and every third person is aged between 10 and 24 years. We have a record of the highest number of children and adolescents, more than 434 million. There is wide variation in reporting of psychiatry disorders in CAMH and the recent national mental health survey reported a prevalence of 7.3% of morbidity amongst adolescents. There is no national data on the prevalence of psychiatric emergencies. Overall there is a trend for increased utilization for psychiatry emergency services by children and adolescents. [1]

An American study reports a 60% increase for mental health disorder being the reason to visit emergency services. [2] Literature reports the most frequently emergencies are suicidal behaviour, depression, aggressiveness, substance abuse, and violence-related situations. The emergency may be related to an underlying mental health condition which has relapsed or may be a first episode of an illness. Repeat visits to the emergency services has been reported from 20-47 %. [3,4]

Psychiatric emergency is an acute disturbance of either behaviour, thought or mood of a person and has a potential for a negative impact. This emergency if unattended can cause harm to the patient or other community members. The clinical presentation of psychiatric emergencies in CAMH is usually differing from that seen in adults. Assessment warrants identifying symptoms, assessment of underlying disorder, the impact of the emergency on child and family, the protective factors and the resources for management. Besides a good history a thorough examination to rule out medical comorbid or aetiological disorders is important. It is imperative to quickly triage and pinpoint symptoms requiring immediate attention. These could be psychomotor agitation, aggressiveness, violence, delirium, and suicidal behaviour. Investigations such as drug screening, blood count, electrolyte analysis, cardiac monitoring, and computed tomography may be required in some cases. Early and prompt identification and treatment would yield positive results. An important competency required is the ability to assess risk and mange it effectively.

With this large child and adolescent population, coupled with paucity of child mental health professionals to serve the psychiatry disorders in CAMH, it is important to have standard guidelines for managing the psychiatric emergencies in CAMH. A guideline on assessment

and management of psychiatric emergencies in children and adolescents encompasses identifying at risk patients, ensuring safety, interviewing of the child and parent, developing a therapeutic alliance, examination, management both pharmacological and non-pharmacological approaches strategies.

II) Epidemiology

Children and adolescents visit the emergency for a variety of reasons. A western study reported that nearly three fourths of the patients had a primary psychiatric diagnosis. The most frequently diagnoses reported were anxiety states/panic disorder (14%), depression (13%), drug abuse (11%), and conduct disorders (8%). Other studies have reported personality disorders and schizophrenia/psychotic disorders, aggressive behaviour, thoughts or actions of self-harm, and medication refills and Autism Spectrum Disorders as reasons to visit the emergency services. Trends have shown a sharp rise self-injury and suicide-related emergency visits among children and youth. [2] The common presentations can be seen in the figure 1.

Figure 1: Presentation to emergency services
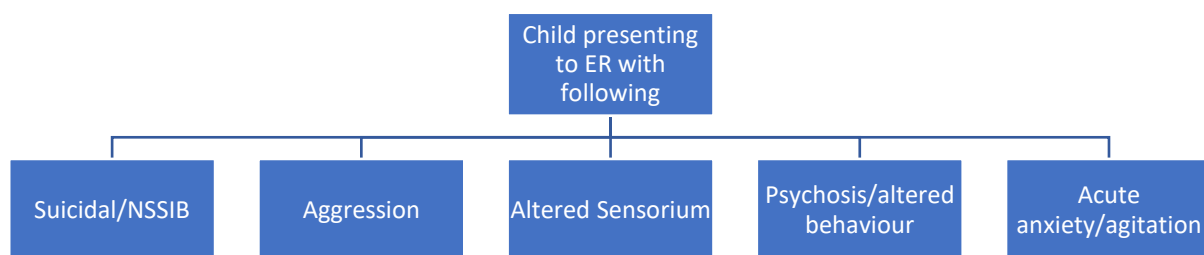
Self-harm behaviours encompass suicide attempt, deliberate self-harm and non-suicidal self-injury (for key terms in suicide literature refer to IPS CPG on assessment and management of Suicidal Behaviours). The World mental health report, 2022 highlights suicide to be the 3rd leading cause of death in 15 to 29 years and the 4th leading cause of death in males in this age group. Overall, it is the 4th leading cause of death among 15 to 29 years old and accounts for 8% of all deaths in this age group.

Aggression refers to a behavioral style aimed at deliberately harming other people or objects and is considered as a way to adapt but can be abnormal when rules are broken. It is a common phenomenon and an important associated feature of psychiatric disorders affecting 10 to 20 % of youth. 'Terrible twos' refers to developmentally appropriate aggression in toddlers which peaks at 30 months and declines by 5 years of age due to development of self -control and cognitive competencies. Social and relational aggression are indirect forms of aggression seen in school going children. During adolescence, the awareness of self- identity and social standing with peers, desire to fit in and desire for popularity can lead to greater aggression.

Acute confusional state, commonly known as 'delirium' is characterized by an abrupt/ acute onset of altered sensorium with a change/ fluctuation in baseline mental status, inattention, disorganized thinking with or without perceptual abnormalities (delusions and/or hallucinations) and is the result of an underlying medical condition. It is a vastly underrecognized and under diagnosed entity in children and adolescents and neither DSM 5 or ICD 10/ ICD 11 include a definition of delirium specific to children and adolescents. Also, given the developmental stage of children, it becomes difficult to apply the definition of adult delirium as it is in children. [5] However, with the development and use of multiple validated tools to evaluate delirium in children and adolescents, it is being increasingly recognized and comprises 10% of all pediatric consultation- liaison referrals. It accounts for ~ 30% referrals for critically ill children and is a marker for serious illness. [6] Like the types of adult delirium, delirium in children and adolescents is classified into 3 subtypes based on psychomotor state- hypoactive delirium (apathetic/ un-interested child), hyperactive delirium (irritable, thrashing child) and mixed delirium (fluctuates between hypoactive and hyperactive state). While many clinical features of adult delirium may be applicable to children, yet some features are more prominent in children. These are- irritability, agitation, affective lability, sleep wake cycle disturbances and fluctuations in symptoms. Perceptual abnormalities (delusions, hallucinations), speech disturbances and memory impairments are less commonly seen in children. Acute onset developmental regression with loss of

previously acquired skills, inconsolable child, reduced eye contact with the care giver are some unique features of delirium in young children.

Psychosis defined as a disruption in the thought process, delusions (false, unshakeable beliefs) and hallucinations (false perceptions in the absence of an external stimulus) as a presenting complaint in children and adolescents in the emergency set up may be a manifestation of a primary psychiatric illness, substance withdrawal or intoxication or may occur in the context of a medical condition. [7]

Amongst the various manifestations, anxiety symptoms/ disorders are among the most common psychiatric conditions in children and adolescents and associated with increased risk of suicide attempts and significant morbidity and mortality. The course is considered as chronic, persistent and recurring with high level of short term and long-term impairment. At any given time, about 7% of youth worldwide have an anxiety disorder and is more common in girl. The lifetime prevalence rates among 13 – 18 years is approximately

20% for specific phobia, 9% for social anxiety, 8% for separation anxiety, and 2% each for agoraphobia, panic, and generalized anxiety. Approximately 4% of children and adolescents experience Posttraumatic Stress Disorder (PTSD) with increases seen in children exposed to trauma. Nearly one-quarter of adolescents presenting to the emergency services have been screened and found to have symptoms compatible with pre-existing PTSD. [8] Occasionally, children present with agitation which needs urgent intervention.

Substance use may present as intoxication, withdrawal or as dual diagnosis. Studies have found that substance abuse and mental health conditions presenting to the emergency have a overlap with 1 in 5 visits for substances complicated by mental health comorbidity. Almost all mental health subcategory was positively associated with substance use. [9]

III) Assessment of children and adolescents presenting with psychiatric emergencies

a. Development of therapeutic alliance

This is the key to a comprehensive assessment. A solid alliance enables improved outcomes. A strong alliance includes understanding the patient and parents' priorities, cultural competence and interpersonal warmth. When working with children or youth with mental illness or at risk of suicide, developing a strong working alliance with parents, caregivers is an important component of the overall relationship – building process. A therapeutic alliance

is an interpersonal process that has relational, cognitive and emotional dimensions and goes beyond superficial friendliness. The task of the clinician is to reach, together with the person a shared understanding of the person's illness and suicidality.

The qualities associated with the development of a strong therapeutic alliance – credibility, warmth, genuineness, empathy, flexibility, regular solicitation of feedback, common understanding regarding treatment goals. Key aspects on therapeutic relationship are highlighted in table 1.

Key aspects of building therapeutic relationships

1. Shared understanding of a young person's thoughts, emotions, beliefs and suicidality/aggression
2. Acknowledge emotional pain in all the patients and recognize that thoughts of suicide are understandable under the circumstances
3. Convey empathy and instill hope to young people and their parents/caregivers
4. Feedback

Table 1: Key aspects on therapeutic relationship

b. History taking and examination

The basic tenets of psychiatric assessment i.e. thorough history taking, general physical examination along with a detailed neurological examination, mental status examination and relevant investigations are to be followed while evaluating children and adolescents presenting with psychiatric emergency. The history should be collected from as many sources as possible; this becomes important because of various reasons like- child may not have acquired speech and language skills, may be having neurodevelopmental conditions which prevent him from active communication, may not feel safe, secure and confident to discuss stressful issues or may be defiant and not ready to talk. It is essential to interview both the parent and child separately. Various techniques for gathering information can be employed such as interview, play observation and behavior observation. It is also essential to observe their interaction. This will help the clinician understand the genesis of the various issues and plan intervention. Parents and children may be able to share all concerns in absence of the other. Children may be able to confide in the therapist in absence of parents.[10]

History taking should include:

- All details of behavior under evaluation- onset, duration, frequency, precipitating/ maintaining/ relieving factors
- Birth & developmental history to assess for neurodevelopmental conditions like intellectual disability, attention deficit hyperactivity disorder, autism spectrum disorder, learning disability
- Substance use history
- Medication use- past and present
- Presence of constitutional symptoms like fever, headache, arthralgias, rash
- Academic performance
- Risk of self-harm
- Psychosocial information: family structure, family and peer relationships, living situation, any adverse situations/ childhood experiences (like trauma and abuse), neighborhood environment, type of parenting
- Past history- hospitalizations, medical conditions like epilepsy, head injury, systemic illnesses
- Family history- psychiatric illness, neurodevelopmental conditions, substance use

Thorough physical examination of all systems (neurologic, cardiac, respiratory) and vital signs recorded. Information obtained through history and examination will guide the choice of investigations to be carried out. Mental status examination helps to understand a person's emotional state and cognitive capabilities & limitations. It starts with assessing the individuals' level of awareness and orientation to the surroundings, eye contact, communication ability, general appearance, degree of distraction, speech, affective state, thought process (worries, delusions, concerns), hallucinations, evidence of separation anxiety. Cognitive assessment includes assessing for memory disturbances, gross level of intelligence and reasoning ability- whether appropriate to age or not, understanding of problems at hand. It is always a good idea to ask for the skills/ strengths/ interests of the child while doing a mental status examination.

Suicidal behavior is one of the most common presenting psychiatric emergencies in children. In the assessment of suicidality various factors need to be considered as highlighted in table 2. [11] Key terms used have already been described in the section on suicide. (IPS CPG on assessment and management of Suicidal Behaviors)

Important aspects in Suicidal assessment involve the following:
1. Risk to harm self and others
2. Clarify diagnosis
3. Risk factors – biological, social and psychological risk factors
4. Level of functioning
5. Identify strengths, support, protective factors to alleviate distress, mitigate risk of harm to self and others
6. Clarify problems and goals
7. Determine the most appropriate level of care for treatment

Table 2: Assessment of suicidality

It is inevitable for a psychiatrist to screen all patients for suicide risk and carry out a comprehensive suicide assessment in suspected children and adolescents. Given the risk of suicide, the risk assessment is necessary to categorize risk and recommend the level of care appropriate to the child. It is also essential to ask questions in relation to suicidality as described in table 3.[12,13]

Various screening instruments are available to assess suicidality in children and adolescents.

1. ASQ (Ask Suicide Screening Questions) developed by National Institute of Mental health is a brief suicide screening questions that takes 20 seconds to administer.

i. In the past few weeks, have you wished you were dead?

ii. In the past few weeks, have you felt that you or your family would be better off if you were dead?

iii. In the past few weeks, have you been having thoughts about killing yourself?

iv. Have you ever tried to kill yourself? If yes, when and how?

v. Are you having thoughts of killing yourself right now?

Key questions
Have you had thoughts of wanting to harm self?
Do you have a plan as to how you would like to harm yourself?
Have you ever taken steps or prepared to carry out this plan?
Have you tried to harm / hurt yourself before? If so, when, and how?
Is there anything/anyone who would keep you from acting on these thoughts?

Table 3: Important questions in interview:

    c. Suicide risk assessment:

It is a one-to-one assessment in which the distressed person is thoroughly interviewed regarding current suicidal desire/ideation, capability, intent, reasons for dying, reasons for living, suicide attempt plan, past attempts and protective factors; thus, enabling risk identification and planning intervention. It is essential to evaluate the motivation and intent of any previous attempt and the understanding of lethality of the suicide act or plan. The various factors to be assessed are mentioned in Table 4. [14, 15]

The SAFE T (Suicide assessment five- step evaluation and triage):

This is tool and a pocket card which guides psychiatrists through a comprehensive risk assessment. It includes the following 5 steps:[16]

1. Identify risk factors – especially noting the modifiable factors, as described in table 4.
2. Identify protective factors – especially those that can be enhanced, as described in table 5.
3. Make a suicide inquiry – ask questions on ideation, plan, behaviors, intent
4. Assess the risk -

The risk assessment includes

- High risk level – severe symptoms or acute precipitating event, protective factors are not relevant, potential lethal attempt or persistent ideation with suicide intent, Intervention includes – admission is indicated, suicide precautions to be administered.
- Moderate risk level – multiple risk factors, few protected risk factors, suicidal ideation with plan with no intent or behavior, admission may be necessary subject to risk factors. Develop a crisis plan is essential.
- Low risk level – Modifiable risk factors, strong protective factors present, Presence of thoughts of death with no plan/intent/behavior. Patient can be managed in outpatient settings. Facilitate symptom reduction. Give emergency contact numbers.

5. Document the suicide risk level, rationale, intervention and follow ups.

High risk factors for suicide in adolescents
Intrapersonal: • Depression(modifiable)   • Alcohol and drug use(modifiable)   • Previous suicide attempts (unmodifiable)

• High risk behaviors (modifiable)   • Sexual orientation confusion(unmodifiable)   • Psychological symptoms – hopelessness, sense of losing control (modifiable)   • Dysregulated sleep (modifiable)
Social/ situation: • Stressor(modifiable)   • Family factors- depression in parents, suicidal behavior, substance use disorders(modifiable)   • Family violence (modifiable)   • Child abuse/neglect   • Lack of social support (modifiable)   • Sense of isolation (modifiable)   • Victim of bullying/being a bully (modifiable)
Others   • Access to lethal means (modifiable)   • Stigma associated with asking help (modifiable)
• Males at a much higher risk than females (unmodifiable)
• Among males - previous suicide attempters (unmodifiable)   • age 16 and above (unmodifiable)   • associated mood disorder (modifiable)   • associated substance abuse (modifiable)
• Among females – mood disorders (modifiable)   • Previous suicide attempters (unmodifiable)
• Immediate risk predicted by agitation and depressive disorder
• Multiple suicide attempters

Table 4: Suicide risk in children and adolescents

Protective factors: As highlighted in table 5 these are factors that mitigate/ reduce suicide risk. Adolescents face challenges such as transitioning to adulthood, facing new independence, identity formation and changing social situations at school and home. They are also at a risk of anxiety or depression due to significant physical, hormonal and social situations at school and home. [15]

Protective factors:
Overall resilience
Problem solving skills
Interpersonal and community connectedness
Safe environment
Awareness and access to physical and mental health care
Positive peer relationships
Positive adult relationships

Table 5: Protective factors:

Non suicidal self-injury (NSSI): Another presentation in pediatric emergencies. Defined as direct, repetitive, socially unacceptable injury to body tissues without suicidal intent. As per ICD 10
(International Statistical Classification of Diseases and related health problems), these exist as a symptom and not as a diagnostic entity. It may vary from deliberate self – harm with suicidal intent to involuntary or stereotyped behavior in developmentally disabled. A common form of deliberate self- harm is cutting and burning. It may be a way to cope with distress, punish themselves, self soothe or manipulate the environment or cry for help. Stereotypic behaviors include hitting, biting, head banging, scratching. [14] Certain risk factors which predispose to non – suicidal self-injury include female sex, earlier NSSI, earlier suicidal ideations and attempts, symptoms of depression and presence of stress. Also, a higher frequency of NSSI is associated with increased risk of suicidal ideations and suicidal attempts. [17]

A clinician must be aware that NSSI and suicidal behavior are discrete entities but they may occur in the same person at different points. Table 6 shows some of the differences between suicide attempt and NSSI.[18,17]

	Suicide attempt	**NSSI**
Intent	Intent to die/ lethal	No intent to die/ not lethal
Age	Seen in mid adolescence	Late latency/early adolescence
Gender	Female> male (attempts)	Similar in both genders

Method	Poisoning, firearms, jumping	Scratching, banging, burning, cutting, self - hitting body parts, interfering with wound healing
Underlying traits	Maladaptive coping mechanism to regulate overwhelming emotions and to endure life	Desire to escape and to end life
Frequency	Very few lifetime acts	Many lifetime acts
Motivation	Escape	Temporary relief of psychic distress
Consequences	Worsen depression/guilt	Relief of distress

Table 6: Differentiate between NSSI and Suicide attempt

d. Risk assessment for aggression

For children and adolescents presenting to the emergency department with aggressive behavior, it is important to evaluate for some of the more commonly associated psychiatric disorders with aggression like conduct disorder, oppositional defiant disorder, attention deficit hyperactivity disorder, substance use disorder, depression, disruptive behaviour disorder, autism spectrum disorder, intellectual disability and gaming disorder.[19] There is evidence of increase in physical aggression in adolescents with pathological gaming.[20]

A comprehensive assessment including developing therapeutic alliance, gathering detailed multi-informant history, examination, mental status examination, remain the first steps to plan an effective intervention.

Performing a risk assessment is important since this involves the safety of the patient and people around. This reflects not only the safety measures that need to be undertaken but also needs of the child and can direct intervention. Relevant factors for risk assessment are shown in table 7. [21]

Biological:

- Reduced autonomic reactivity
- Decreased cortisol levels associated with proactive aggression
- HPA axis hyperactivity
- Hypo reactivity of amygdala – marker of impaired emotional processing

- Deactivation of ACC during emotional response – leading to deficient emotional processing
- Lower intelligence
- Deficits in executive functioning
- Perinatal risk factors – maternal smoking and alcohol use
- Parental psychiatric disorder
- Genetics
- History of violence (especially recent)
- Intoxication
- Command hallucinations
- Impulse control disorders
- Concurrent psychosocial stressors
- Verbal and physical threats
- Psychomotor agitation
- Paranoia

Social
- Adverse family circumstances – poverty, physical punishment and neglect
- Lack of parental discipline – inconsistent and inconsequent parenting practice (low positive involvement, more hostility and punishment)
  Access to firearms/ weapons

Psychological
- Personality
- Substance use
- Previous history of self - harm, violence and abuse
- Adverse childhood experience
- Gaming disorder

Table 7: Risk factors and correlates for aggression and conduct disorder[22]

e. Assessing for reversible causes for altered sensorium

While assessing a child or adolescent who presents with behavioural abnormalities and altered sensorium, additional information should be gathered with respect to onset of symptoms, type of symptoms- altered sensorium, inattention, memory disturbances, sleep wake cycle disruptions, agitation, perceptual abnormalities, disturbances in thought

processes, any fluctuation in symptoms, medical history including acute/ chronic medical illnesses/ infection, medications, pain, anemia etc. and metabolic derangements. Altered sensorium can be due to various factors and some of the modifiable factors (listed in the table 8) can be remembered in the form of an acronym 'BRAIN MAPS' given by Smith et al. 2013. [23]

B	Bring oxygen: treat hypoxia, anemia, improve cardiac output
R	Remove/ reduce drugs contributing to delirium: anticholinergics, benzodiazepines
A	Atmosphere: foreign environment, bright lights, loud noises, physical restraints, frequent change in caregivers, no consistent schedule
I	Infection, inflammation, immobilization
N	New organ dysfunction
M	Metabolic disturbances: hyponatremia/ hypernatremia, hypokalemia/ hyperkalemia, hypoglycemia, hypocalcemia, alkalosis, acidosis
A	Awake: disturbances of sleep wake cycle, lack of consistent bed time routine
P	Pain: too much pain, under- treated pain, overtreated pain
S	Sedation: assess the need for sedation and appropriate sedation

Table 8: Modifiable factors contributing to development of delirium in children (Smith et al 2013) [23]

f. Assessment for causes leading to presentation as psychosis

Assessment of children presenting with psychosis requires knowledge of various causes that can present with psychosis as a presenting complaint and some of them are listed below in table 9.[7]

Known CAUSES	
Central nervous system	Infections: Herpes simplex encephalitis, arboviruses, measles encephalitis, sub-acute sclerosing panencephalitis, HIV, Epstein bar virus, meningitis, tuberculosis, cerebral malaria, toxoplasmosis Neurodegenerative disorders: multiple sclerosis, Huntington's chorea Epilepsy: temporal lobe epilepsy, post ictal psychosis, Landau-Kleffner syndrome Head injury Stroke CNS mass lesions: tumors, abscess Hydrocephalous Vascular: venous thrombosis, ischemia, aneurysm
Rheumatological conditions	Systemic lupus erythematosus, sarcoidosis
Toxins	Lead poisoning, carbon monoxide poisoning, organophosphate poisoning
Nutritional deficiency	Anemia, vitamin B12 deficiency, vitamin D deficiency

Inborn errors of metabolism	Adrenoleukodystrophy, lysosomal disorders, cerebrotendinous xanthomatosis, homocystinuria, urea cycle defects
Autoimmune disorders	NMDA encephalitis, Hashimoto's encephalopathy, thyroid storm, antiphospholipid syndrome
Others	Wilson's disease, Acute intermittent porphyria
Substance overdose/ abuse	Volatile substances, hallucinogens (lysergic acid, phencyclidine), marijuana, datura, MDMA, amphetamines, methamphetamine, cocaine, bath salts
Prescription drug side effects	Anticholinergics, decongestants (pseudoephiderine), steroids, isoniazid, antibiotics (amoxicillin, clarithromycin, erythromycin), antiepileptic drugs (phenytoin, topiramate, levetiracetam), statins, antiviral agents, immunosuppressive agents
Drug related syndromes	Serotonin syndrome, neuroleptic malignant syndrome, baclofen withdrawal, benzodiazepine withdrawal, sudden psychotropic withdrawal
Primary psychiatric illness	Depression, bipolar disorder, early onset schizophrenia, acute and transient psychosis. Trauma and abuse, emotional issues

Table 9: Causes of psychosis/ psychotic symptoms in children

For assessment of children presenting with psychotic symptoms, a thorough medical evaluation should be carried out and medical stabilization should be done whenever required. Drug ingestion/ overdose whether intentional or unintentional may not be recognizable immediately as children are not usually in a position to provide information. So, efforts for rapport building with the child and the family should start at the first contact and continue thereafter. Additionally, it is imperative to provide support to the care givers when their child is being evaluated. *It is also to be remembered that transient psychotic like symptoms may be just a developmental phase in the young child, however, such presentations require a careful information elicitation and continued monitoring of symptoms.*[10]

Individuals with a primary psychiatric illness usually have normal vital signs, normal orientation to surroundings and hallucinations are mostly auditory in nature. In contrast, individuals with psychotic symptoms in the context of an underlying medical condition may have abnormal vital signs, disorientation, positive signs on physical examination, visual and tactile hallucinations. There are certain indicators for an underlying medical condition in the context of psychotic symptoms which can be helpful in arriving at a differential diagnosis. These are:

- New and recent onset symptoms and/or behavioural change
- Younger children
- History of substance use/ recent medication use

- Abnormal vital signs, abnormality of physical examination and/or neurological examination

- Symptoms like disorientation, visual hallucinations, fluctuations in mental status, emotional lability, etc.

One should always clinically assess for altered sensorium, since altered sensorium and psychosis in young children can be difficult to differentiate.

g. Assessment of anxiety and agitation in children and adolescents

Anxiety and agitation can have a myriad reason. One needs to differentiate from developmentally appropriate worries, fears and response to stressor. As described in the **table 10**[24, 25]

	Developmentally normal anxiety	Pathological anxiety
Intensity	As per developmental age and event, the anxiety is realistic	The degree of anxiety is unrealistic as per developmental stage and event.
Impairment	No interference in daily life Dysfunction seen in academics, friendships and family life	Impairment in academic and family life.
Course	Usually remit	Chronic and persistent and linked with poor long term functioning, suicidality and general health.
Treatment	Usually these children experience remission	Pharmacological and non-pharmacological approaches are used

Table 10: Difference between developmentally normal anxiety and pathological anxiety

Detailed clinical history detailed clinical history and examination help ascertain key areas of concern and presence (or absence) of problems. A patient may present with an overwhelming surge of anxiety, stress and fear. They may present as distress, cry spells, tantrums, freezing, clinging or not wanting to leave a familiar person. Panic attacks peak at late adolescence affecting 5-10 % adolescence. They express a fear of death with autonomic symptoms such as tachycardia, palpitations, sweating, shortness of breath, chest pain, choking sensation, nausea, abdominal pain, tremors, tingling and numbness. In children with marked stress and fear in social situations, may cry and throw a tantrum and present as panic attack.

Children who experience trauma following an actual or threatened death, accident, injury or threat to physical integrity or witness an event (such as sexual abuse, assault, shooting or an earthquake) may present with PTSD. A response in the form of intense fear, helplessness and horror and may present in emergency settings. [24] In an emergency setting, altered consciousness with fluctuating attention needs to be differentiated from trance states or black outs. They may also have depersonalization or derealization episodes.[26] A child's belief of alternate self or imaginary self which control child's behaviour and they may present in the ED.

Comorbid psychiatric illness which may have anxiety include (but are not limited to) depression, ADHD, and behaviour, bipolar, obsessive-compulsive, eating, learning, language, and substance-related disorders. It is necessary to look for comorbid medical illness hyperthyroidism, caffeinism, migraine, asthma, diabetes, chronic pain/illness, lead intoxication, hypoglycemic episodes, hypoxia, pheochromocytoma, central nervous system disorders, cardiac arrhythmias, cardiac valvular disease, systemic lupus erythematosus, allergic reactions, and dysmenorrhea. Medications that can cause anxiety include (but are not limited to) bronchodilators, nasal decongestants and other sympathomimetics, antihistamines, steroids, dietary supplements, stimulants, antidepressants, antipsychotics, and withdrawal from benzodiazepines (particularly short-acting).[27]The children who present with seizure like episode, a clinician needs to differentiate between a dissociative convulsion and epileptic seizure.[28]

IV.   Use of Rating scales:

There are various rating scales which can be used to augment information obtained by clinical interviews. Some of the rating scales that can be used for various presenting emergencies are listed in table 11 below.

Scale	Validated age of use	Administered by and use	Remarks
For assessment of suicidal behaviour			
Self -completion by child and adolescent			
Beck hopelessness	Adolescents	Assess hopelessness	17 True and false items,

scale (BHS) [29]			clinical/ research and screening.
Columbia Teen Screen (CTS) [29]	Adolescents (11 to 18 years old)	Screen for suicidal behavior, ideation and risk factors	26 Item clinical/ research and screening. High sensitivity and specificity
Suicidal Ideation Questionnaire (SIQ)[30]	Adolescents (11 to 18 years old)	Measures frequency and severity	Research and screening. High sensitivity and specificity
Suicide probability Scale[31]	Ages +14 years	Clinical index of suicide risk	Clinical purpose Self rated
Child Adolescent Suicidal Potential Index [14]	6 to 17 years old	Assess suicidal behavior	30 yes/no items clinical/ research and screening Excellent reliability and validity
Clinician administered: child and adolescent			
Child suicide potential scale [14]	6 to 12 years olds	Assess suicidal behaviors and risk factors	Clinical and research use
Suicide potential interview [14]	11 to 18 years old	Suicide risk assessment	Diagnostic, research and screening
Columbia Suicide severity Rating scale (C- SSRS) [14]	Has been tried children less than 5 years of age	Assess the patient's responses to screening questions. Validated in emergency situations too	Translated in more than 30 languages. Has been used as a screening tool for suicidality
For assessment of aggression			
Child behavior checklist (CBCL) [33,34]	Ages 6 to 18 years	Parent report of ADHD, ODD and CD.	112 items rated on 3 point scale, plus social activity/academic performance subscales Yields internalizing scores (subscales: withdrawn, somatic complaints, anxious /depressed) and externalizing scores (subscales : Delinquent behavior and aggressive behavior) Screening and tracks outcome
Modified Overt		Rates behavior over a 1	For outpatient settings

aggression scale (MOAS) [35]		week. • Verbal • Aggression against property • Autosuggestion • Physical Five -point response format Allows assessment of both severity and frequency	
Impulsive/Premeditated Aggression Scale (IPAS) [36]		Self - report. Half of questionnaire items correlate with impulsive aggression, whereas the	
Children's Aggression Scale – Parent and Teacher versions (CAS)[37,38]	5 to 18 years old	Frequency and severity of aggression in children and adolescents	Five domains: Verbal aggression, Aggression against objects and animals, Provoked physical aggression, Unprovoked physical aggression, and Use of weapons. Distinguishes aggression 1) inside vs. outside the home and 2) against children vs. adults
For assessment of altered sensorium			
Pediatric Anesthesia Emergence Delirium Scale (PAED) [39]	> 1 year	Clinician rating on behaviour observations: Eye contact, goal directed outcome, awareness of surroundings, restlessness, whether inconsolable child. Rating from 1 (not at all) to 5 (extremely)	Bedside rating scale to detect emergence or hyperactive delirium; not useful to detect hypoactive delirium
Cornell Assessment of Pediatric delirium (CAPD) [40,41,42]	Children of all ages	Caregiver rated, 8 item scale. Scoring from 0 (not at all) to 4 (extremely). Scores $\geq$ 9 indicates delirium	Bedside tool, easy to administer by caregiver, even in critically ill children, can pick subtle behaviors over time, useful to identify hypoactive and hyperactive delirium
pCAM-ICU	> 5 years	Clinician rated; based on	Can also be used on

		DSM-IV-TR criteria.	children receiving

psCAM-ICU[43.44,45]	6 months – 5 years	1. Acute change or fluctuation in mental status
		2. Inattention
		3. Altered level of consciousness
		4. Disorganized thinking
		If (1) nor (2) is present- negative screen for delirium
		If (1) and (2) are present plus either (3) or (4) present- positive screen for delirium
			mechanical ventilation. It follows a 2 step process for assessment of delirium: 1) Arousal assessed by a sedation scale
			2) Delirium is assessed if patient is at least arousable to voice

Sophia Observation Withdrawal Symptoms- Pediatric Delirium Scale (SOS-PD)[46]	3 months -16 years	Clinician rated scale. 22 items- 17 items pertaining to symptoms of pediatric delirium (PD) and 15 items pertaining to symptoms of iatrogenic withdrawal syndrome (IWS) resulting from prolonged administration and/or high doses of benzodiazepines or opioids; 10 overlapping items. 'Yes/ No' response for symptoms observed in the previous 4 hours.	Easily administered in 2-5 minutes
For assessment of psychosis			
Brief psychiatric Rating Scale for children (BPRS-C)[47]	5-18 years of age	Assess emotional & behavioral problems in children; 21 items scored on a 7- point likert scale	Easy to administer; takes 5 minutes
For assessment of anxiety			
Paediatric Symptom Checklist [48]	primary care, school, or other child-serving settings	It is social−emotional screening instruments	
The Multidimensional Anxiety Scale for Children[49]	> 8 years		
The Screen for Child Anxiety and Related Emotional Disorders (SCARED) [51]	> 8 years		
The Spence Children's Anxiety Scale (SCAS) [51]	> 8 years		

Preschool Anxiety Scale[51]	2.5 to 6.5 years	parent report adapted from the SCAS that was developed for screening for anxiety in young children.	
The Social Anxiety Scale, the Social Worries Questionnaire, and the social phobia subscale of SCARED[50]	> 8 years	brief screening measures for social phobia/social anxiety symptoms	

Table 11: Rating Scales used in children and adolescents in the emergency setting:

V)Investigations:

The choice of special investigation to be advised (e.g. MRI brain, lumbar puncture, EEG, autoimmune panel, urine for porphobilinogens, specific metabolic studies, etc.) usually is guided by the information gathered through history and examination. The investigations may include a complete blood count, toxicology screen for substances, renal function test, liver function test, electrocardiogram, neuroimaging and many more.

VI)Diagnosis:

Diagnosis should be made as per the standard nosological system. However, it should be remembered that a final diagnosis may not be easy to make in an emergency setting (underlying medical conditions will be picked up on investigations) and some psychiatric symptoms like aggression, suicidal behaviour, agitation, altered behaviour, psychotic symptoms are a presentation of many disorders. Therefore, a thorough history, physical and neurological examination, mental status examination will help to come to a provisional diagnosis.

VII. Management of psychiatric emergencies in children and adolescents

1. The decision for admission

The main goal of assessment of children and adolescents in the emergency setting includes triage and focused care, medical stabilization, ensuring safety of the child or adolescent, relevant investigations, diagnostic clarification, deciding the treatment setting (inpatient-psychiatry, inpatient- pediatrics, intensive care unit or outpatient services). Patients with severe symptoms often warrant admission.

Medical stabilization includes care of hemodynamic status (A- airway. B- breathing, C-circulation), nutritional status, physical activity, pain, sedation. Thereafter, the first step should be assessment for altered behaviour/ delirium. In any case where altered behaviour is

present then, the management of altered behaviour takes precedence (the management of altered behaviour is described in the sections below).

Children and adolescents with active suicidal ideations and attempts should be hospitalized if the child's condition is unstable. Caregivers' supervision to ensure that drugs and any means of self-harm should be inaccessible to the child/adolescent at risk.[14]

Steps for suicide prevention in wards are necessary. It is essential to remodel wards to prevent suicide attempt in the ward. Eliminate structures that support hanging objects exposed pipes, towel hooks. Install windows that do not open from inside. Remove harmful objects from vicinity. Non sharp utensils are advised to be used. Attendant or caregiver supervision is to be maintained throughout. In children and adolescents, partial hospitalization offers intensive multidisciplinary treatments and skilled observation and support. This can be offered in those who are disturbed however have a supportive care environment. This allows intervention to stabilize the emotional condition and address stressors.

2. Treatment in emergency services

The treatment will vary depending on the cluster of symptoms

- Self harm

A detailed discussion with the family and child about specific issues, triggers and situations that result in suicidal behavior must be carried out. A written verbal no suicide contract is commonly discussed with the child and is also used as a probe to understand if the thoughts on suicide change in the child. A verbal or written no suicide contract has not shown evidence in preventing subsequent suicides. [14] However, a safety planning should be conducted in the emergency department.

It is here that the mental health professional provides an important function of triage, referring suitable patients for subsequent treatment. Rosenthal – Borus et al, 1996[52] described a brief emergency room crisis intervention procedure for adolescent attempters. The aims are to facilitate a good experience between family and emergency service staff, set realistic expectations about follow up treatment and obtain a commitment from adolescent and relative towards follow up. A detailed discussion with the patient and family about specific issues or situations which enable suicidal behavior, ongoing stressors and identifying potential precipitating factors are important.[14] In the emergency situation, once the wound care and dressing is completed a complete psychological assessment in necessary. Upon evaluation when it is clear that the self harm is NSSI, then interventions focusing on

developing motivation to change, facilitate family support and strengthen positive affect can be taken up in regular outpatient care. [53]

Safety planning:

A safety plan is a document with 6 steps where the clinician and patient discuss warning signs, coping strategies, way to reach out for help and make an environment safer. It involves collaborative work in which the individual develops a personalized list of coping strategies. Steps of safety planning are shown in table 12. [11,12]

Safety planning
Discuss warning signs (mood, behavior, thoughts, images, situation)
Internal coping strategies (relaxation exercise, physical activity) – things I can do to take my mind off my problems without contacting another person
People and social settings that provide distraction
People whom I can ask for help
Professionals or agencies I can contact during a crisis (Lifeline)

Table 12: Safety planning measures

Safety plan
Example of elements of a safety plan
Step 1: Warning sign
- I feel hopeless and suicidal

- Witnessed an argument between my parents

- Thoughts of previous suicidal attempt

Step 2: Internal coping strategies – Things I can do to distract myself / cope
- Listen to music

- Read a book

- Journal my thoughts

Step 3: Social situations or people that can help to distract me
- Talk to mom

- Talk to my cousin

Step 4: People whom I can reach out to for help
- Ask Dr ABC for help in …. Hospital

- My teacher PQR   mobile:

Step 5: Professionals or agencies I can contact during a crisis:
  1. Dr. Name/mobile no./emergency contact

2. School counsellor Name/mobile no./emergency contact

3. Local hospital emergency

4. Suicide helpline

Make environment safe:
1. Medications with mom

2. No harmful objects in vicinity

A study done on adolescents to assess the association between profiles and mental health utilization reveals five profiles of elevated suicide risk with differing patterns of risk factors which includes history of multiple suicide attempts, suicidal ideations in the last month, depression, substance use, aggressive behavior and abuse. [54]

 Pharmacologic treatment:

Pharmacologic approaches involve treatment of the underlying psychiatric condition.

Lithium reduces suicidality and suicide attempts in previous attempters. However, in children and adolescents' supervision to be exercised in view of potential overdose in suicidal children.[14] SSRIs (Selective Serotonin reuptake inhibitors) are used to treat underlying depression. These are considered a first- choice medication in suicidal children and adolescents. The clinician must keep a watch on emerging side effects such as suicidal ideas in such patients. One of the major concerns with the use of antidepressants among children and adolescents is the emergence of suicidal ideations in (Black box warning) against the use of antidepressants. A cautious approach needs to be considered using antidepressants among children and adolescents and they must be monitored for any treatment emergent suicidal behavior.Clozapine can also be used in children and adolescents with suicidality as **off label use**.[14] Studies have reported use of Ketamine in youth with decrease in suicidality however findings need to be substantiated with longitudinal studies, safety, efficacy and abuse potential in youth. [55]

Specific psychotherapies:

Whilst crisis intervention is possible in emergency settings, once stabilized the child may be engaged in other forms of therapy such as CBT, Interpersonal psychotherapy and dialectic behaviour therapy. Family therapy is specifically designed to treat depression and suicidal thoughts/behaviors. It is to protect adolescents against suicidal ideations and risk behaviors by improving family processes and secure parent child bond.

When children and adolescents report suicidal ideas they experience intolerable agony, hopelessness and helplessness. They may impulsively respond to desperation by attempting

suicide. Psychotherapeutic techniques aim at reducing intolerable feelings and thoughts and reorient cognitive and emotional perspectives of the suicidal child and adolescent.[14]

It is essential for the clinician to relate to the child

- Honest and consistent way
- Understand suicidal patient's attitude and life problems
- Convey and instill hope and optimism

Electroconvulsive therapy: Suicidality is one indication for electroconvulsive therapy in children. ECT is considered in patients with a failure of response to two adequate trials or in conditions which are life - saving. As per the Mental Health care act, 2017, Electroconvulsive therapy can be given to children with informed consent obtained from guardians and with the permission from the Mental Health review board.[56] However, this cannot be in an emergency setting.

Follow up and discharge planning

A checklist can be kept in mind before discharging a patient who has attempted suicide

Children and adolescents shall never be discharged from the emergency without the verifying account from the parent.

- Ensuring supervision by a supportive person at home
- Inaccessibility to lethal means (drugs, weapons, knives, harmful objects)
- Drug dose/duration
- Check that follow -ups are closely spaced. [14]

The doctor and parent need to be advised to monitor for warning signs:

- Thoughts of dying: If the child voices thought of dying, disappearing, shooting, other form of self-harm, jumping.
- Change in behavior – Sad, withdrawn, irritable, anxious, restless, indecisive, difficulty in concentration
- Change in sleep patterns – early awakenings, excess sedation, nightmares, insomnia
- Change in eating habits – loss of taste and appetite, overeating

- Aggression

The Centre for Education and Research on Mental health therapeutics (CERT) guidelines for the treatment of Maladaptive aggression (TMAY) II recommend the following:[57]

1. Intervene by giving evidence- based psychotherapy
2. Engage the child, family and school in psychosocial strategies
3. Initiate psychopharmacologic treatment for psychiatric conditions
4. Evidence based guidelines to treat primary (underlying) disorders
5. Residual aggression persists then treat with atypical antipsychotic

Treatment planning in an aggressive patient should include a review of aggressive behavior, including triggers, warning signs, repetitive behaviors, response to treatment and prior seclusion and restraint events associated with aggressive acts along with diagnosing and treating the underlying psychiatric illness. Cognitive limitations, neurological deficits and learning disabilities need to be taken into consideration.

De- escalation strategies include helping patients manage anger outbursts by using anger management and stress reduction techniques. The de- escalation strategies include allowing children to use self-direction, prompts to manage their own behavior, ignoring peer provocation, negotiating with peers and use self - directed time out. Prompts that aid children in using these strategies should be a primary treatment intervention and should be included in the treatment plan.

Aggression is often preceded by a period of escalating agitation. Psychosocial interventions help regain self-control and can help avoid the need for physical and chemical restraints. When the youth exhibit warning signs of aggression, behavioral intervention such as verbal interventions, time out or quiet time can be used. A stat dosing or injectable can be used to avoid the aggressive episode when anticipated. In case, less restrictive options fail and there is a danger to self or other and/or imminent danger of damaging property, restraint can be used. All restrained patients should have their pulse, blood pressure and range of motion in their extremities checked every 15 minutes. (Refer to section on aggression in psychosis).

As per the CMS restraint guidelines, regulations apply to both physical and chemical restraint. Documentation is required for the need and monitoring of restraint of 100 % of patients.

Under 9 years of age – every 1hour restraint is to be renewed

From 9 to 17 years of age – every 2 hours restraint is to be renewed

Above 18 years of age – every 4 hours restraint is to be renewed

Monitoring and basic care requirement

Visual check – every 15 minutes or constant observation

Release a restraint – every 2 hours (may re – apply if needed)

Neurovascular check – every 2 hours

Offer food / water/ bathroom – every 2 hours

Behavior check – every 2 hours

Respiratory status check – every 2 hours

Change physical position – every 2 hours

Verbal restraint

The clinician can introduce oneself, prepare the patient for what will happen, respect the patient's autonomy. It is imperative to also offer food and liquids and offer empathic listening. A clinician must keep in mind about asking patient's requests/preferences and honoring reasonable requests. Simple, direct and soft language with decrease in stimulation is important. Reassure the patient that they will be safe and offer distraction. Ensure to remove brittle objects/ equipment in the vicinity of the patients.

Physical restraints:

Supine position, avoid covering the patient's face/mouth/nose. Avoid pressure on neck/back and chest. Elevate the head of the bed, if possible. [58]

Pharmacological approaches:

Taking into account the child's age and development, in addition to psychotherapy, pharmacological approaches are used in patients with aggression. In very young children and preschoolers, caution is to be exercised and non- pharmacologic approaches are preferred. It is important to "start low and go slow" and regularly assess for side effects and progress.

Stimulants like Methylphenidate is efficacious in reducing aggression in children in ADHD and disruptive behavioral disorder and improvement is also seen in oppositional behavior and aggression. Alpha agonists have weak evidence in improving aggression in children and adolescents. SSRIs have shown efficacy in improvement in irritability in children and adolescents with severe mood dysregulation, whereas, atypical antipsychotics have strong evidence for use and efficacy in treatment of aggression in different psychiatric disorders.

Among antipsychotics, Risperidone is used as first line treatment for aggression, especially in autism spectrum disorder, ADHD and conduct disorder. Aripiprazole is also used for treatment of irritability associated with autism spectrum disorder and there is off label use of aripiprazole for aggression. Other atypical antipsychotics such as olanzapine, clozapine, quetiapine, ziprasidone, lurasidone have shown some evidence in reducing aggression. Treatment recommendations for the Use of Antipsychotics for Aggressive Youth (TRAAY)

recommend tapering of antipsychotics after 6 to 9 month period without aggression. Typical antipsychotics are usually not recommended due to the risk of tardive dyskinesias. It is important to monitor safety of antipsychotics medications by educating parents and children. Valproic acid can be used in patients with aggression in disruptive behavior disorder and mood lability. Lithium reports to lower aggression in patients with temper outbursts, physical aggression, explosiveness in youth. The various drugs with doses have been described in Table 13. [59]

Drugs	Initial dose	Onset	Half life (hours)
Lorazepam	0.05- 0.1 mg/kg Teen – 2-4 mg	20-30 mins(PO) 5 -15 mins(IM)	12
Midazolam	0.05 -0.15 mg/kg Teen – 2-4 mg	20-30 mins(PO) 5 -15 mins(IM)	3-4
Haloperidol	0.1 mg/kg Teen – 2-4 mg	30-60 mins(PO) 15-30 mins(IM)	21
Risperidone	<12 yrs- 0.5 mg Teen – 1 mg	45- 60 mins(PO)	20
Olanzapine	<12 yrs- 2.5 mg Teen – 5 – 10 mg	45- 60 mins(PO) 30-60 mins(IM)	30
Aripiprazole	<12 yrs- 1 -2 mg Teen – 2 – 5 mg	60- 180 mins(PO) 30-120 mins(IM)	75
Clozapine	6.25 mg starting dose 150-300 mg in children 200-600 mg in adolescents	1.1 – 3.6 hours	5 – 16 hours
Ziprasidone	<12 yrs- 5 mg Teen – 10-20 mg	60 mins (PO) 30-60 mins (IM)	2-7 hours
Quetiapine	Child - 12.5 mg Adolescent - 25 -50 mg	1-2 hours	6 hours

Table 13: Drugs and aggression:

Psychotherapy for aggression

Whilst crisis intervention may have some role, therapy is offered in non-emergency settings. Therapies for aggression are based on social learning theory and developmental principles taking into account the age of the child.

In younger children, effective programs are behaviour modification and emphasis on helping parents improve parent – child interactions. In children less than 12 years or younger, multiple evidence - based Parent centered programs have been effective. These deal with parenting skills, enhancing relationship between parent and child through effective emotional communication and parent management training. Child centered programs are used where elements of cognitive behavioral therapy focus on assisting the child in identifying triggers of aggression, challenge cognitive perceptions and improved problem - solving skills. Family centered programs address dysfunctional interactions between family members, focus on pro social skills such as cognitive reframing, attentive listening, address unresolved conflicts that perpetuate aggression. Multimodal psychotherapies such as multisystem therapy and others combine different methods of intervention addressing the needs of the child. [21]In patients with gaming disorder, CBT and family interventions are beneficial.[60]

- Delirium

There is very little literature available on the management of delirium in children and thus, clinical practice is based on expert opinion or on information extrapolated for literature on delirium in adults. [61]. It is generally recommended that the three- pronged approach for management of adult delirium can be readily applied for management of delirium in children. It involves identification and management of predisposing factors which gives a clue to the underlying etiology of delirium. The three most common causes of delirium in children are infections, medication related factors and auto-immune related factors. [62] There should be judicious use of the most common deliriogenic medications, namely anticholinergic agents (diphenhydramine, atropine, scopolamine, chlorpheniramine, hyoscyamine), benzodiazepines and opioids. The table enlisting the various modifiable factors (BRAIN MAPS) can be used here. This will also direct the investigations that need to be done. There are no FDA approved drugs for prevention and treatment of delirium in children. Pharmacologic treatment may be required when the symptoms of delirium interfere with the care and safety of the child and

the underlying cause in either under evaluation or one that cannot be immediately remedied. Additional benefit of pharmacological treatment of delirium in children is to shorten the duration of delirious state, reduce emotional trauma and distress associated with invasive procedures and hospitalization and to shorten hospital stay. Antipsychotics are the preferred drugs, always started on the lowest dose and then titrated depending upon the child's response. There is no recommended dose range established for use in delirium in children, however, it is advised to start low and go slow. Amongst, the antipsychotics haloperidol is especially useful parenterally when oral medications cannot be given/ not tolerated/ severe agitation is present. [63] Second generation antipsychotics like risperidone, olanzapine, quetiapine are also useful in the treatment of delirium. Emergence of side effects like tachycardia, QTc prolongation, hypotension, sedation, extrapyramidal side effects should be monitored. Non- pharmacological management of delirium is highlighted in table 14.[64,65] Role of melatonin Although melatonin is being used for management of delirium in adults, its use in the pediatric population is less researched. A retrospective single center study in children aged 1-18 years admitted to PICU (pediatric intensive care unit) reports that the use of melatonin for delirium did not decrease the use of antipsychotics for management of delirium. Hence, use of melatonin in managing pediatric delirium requires further research. [66]

Environmental modification	Calm, reassuring, consistent, adequately lighted and predictable environment Pictures of family, home etc. can be put in the room Children who wear glasses or hearing aids should wear them when possible Avoid frequent change of care givers
Promotion of sleep	Optimization of noise and light exposure to promote sleep. Sleep during day except scheduled rest times should be discouraged. Eye mask to block light during sleep. Avoid overstimulation particularly before bed time.
Providing re-orientation cues	Calendar and clock for day and time identification Picture of sun during day and moon during night Actively reorient the child
Communication	Speak in a clam and slow pace using clear and short sentences Explain why and where the child is Do not make continued attempts to engage the child; do not argue with the child for any perceptual abnormalities the child might be reporting Do not put questions to the child; rather remind the child about the time of the day

Table 14: Non- pharmacological management of delirium

Care giver involvement in the management of delirium in children: management of delirium in children is incomplete without addressing the carers anxieties and dilemmas. Providing frequent reassurance and guidance about the behaviour of the child, fluctuations in symptoms, their role in non- pharmacological management of delirium and the expected outcome of the condition are essential. [63]

- Psychosis

In cases presenting with psychotic symptoms in the absence of altered sensorium/ delirium, the initial steps should be directed towards trying to identify the organic causes for psychotic symptoms. Thus, information obtained along with detailed general physical examination and neurological examination gives clues for relevant investigations to be done. In cases with focal neurological deficit, relevant investigations and appropriate care and referral should be done. In cases where no focal neurological deficit is evident, thorough hematological parameters i.e. complete hemogram, liver function test, renal function test, thyroid function test, serum ammonia level and toxicology screen should be done. In cases with preserved sensorium and no abnormality in investigations, one should consider for a pediatric neurology consultation and plan further investigations to evaluate for autoimmune encephalitis, porphyrias, Wilson's disease. Where abnormality in investigations is detected, appropriate referral and management should ensue and in cases where no abnormality in investigations is detected, the case should be managed as per the guidelines for the management of primary psychiatric illness.

Pharmacological management involves treatment of underlying medical condition in cases where psychotic symptoms are present in the context of a medical illness along with treatment of agitation and violent behaviour as the situation demands. However, a step wise approach should be followed in initial management of a violent and/or agitated child.

- Verbal de-escalation: The aim of verbal de-escalation is to distract the child by talking to him/her.
- Show of force: It is another calming method which elicits co-operation.
- Chemical restraint: Sedative/ hypnotics are used preferably orally. Lorazepam (0.05-0.1 mg/kg) or haloperidol (0.025- 0.085 mg/kg; maximum 5 mg) orally is an alternative to benzodiazepine sedation in acutely psychotic child or adolescent. [67] Due to high propensity of side effects due to use of typical antipsychotics, atypical antipsychotics (olanzapine, risperidone, quetiapine) can also be used.

- Physical restraint: 'Therapeutic holding' is a less severe form of physical restraint where the child/ adolescent is held by 2 persons to allow for time to the child to regain control over his/ her behaviour. This method is less confining and is allowed up to a maximum of 10 minutes and should be used prior to physical restraint, in cases where physical restraint is unavoidable and is the last resort available. Proper and adequate documentation about the nature of emergency, patient benefit and parental consent is mandatory. It should be used for minimum possible time with continuous monitoring of vital signs.

Pharmacological management includes treatment with antipsychotics, antidepressants, mood stabilizers and benzodiazepines depending upon the primary psychiatric diagnosis. [68]

Anxiety

Good therapeutic rapport and alliance with the child is must. It is also very important to have good doctor–parent relationship because the parents have to become an ally in treatment of the child. Parents should be involved. in the process of assessment the child and the family should be strongly assured that there is nothing physically seriously wrong with the child and the symptoms are psychogenic. [28]

Acute treatment [28]: This includes the important aspects in care as highlighted in table 15. Psychoeducation also forms another important aspect in management as highlighted in table 16.

- Assurance
- Relaxation/de escalation
- Doctor-child and family relationship
- Restoration of communication in the family
- Realistic solution of the problems
- Reduction of sick role and secondary gains
- Promotion of positive behavior
- Teaching healthy coping
- Treatment of comorbid psychiatric or physical disorders

Treatment of chronic condition on follow up

- Family-focused cognitive behavior therapy

Table 15: Acute treatment includes the following:

- It should be acknowledged that the child has real symptoms and sufferings, but the reasons could be psychological and not physical

- Harmlessness of the symptoms should be emphasized. It should be emphasized that symptoms are not dangerous or fatal Symptoms in the absence of serious physical disease are common.

- These symptoms could be better explained by the mind-body relationship, for example, anxiety can lead to palpitations, tremors, rapid breathing, sweating, etc.

- Emotions can cause physical symptoms and this can happen even in children

- Stressors may not be severe or unimportant from an adult point of view but may be very important matter of concern for the child

Table 16: Important Points for psychoeducation [28]

In an emergency setting
- Crisis intervention
- Supportive therapy is implemented

Cognitive Behavioral Therapy (CBT) and mindfulness based therapies can be considered on follow up. [24]

Pharmacotherapy : Whilst de-escalation and reassurance are the first steps, in severe cases pharmacotherapy plays a role. [69]. Table 17 shows the various drugs along with doses and indications for treatment of anxiety.

SSRIs	Dose	Age
Fluoxetine	20 mg/d	7-17
Fluvoxamine	50-250 mg/d child, max 300 mg/d adolescent	6-17
Sertraline	50 mg/d	5-17
Paroxetine	10-50 mg/d	8-17
TCA		
Imipramine	100-200 mg/d	

Clomipramine	40-75 mg/d	
BZD		
Alprazolam	0.75-4.0 mg/d	
Clonazepam	0.5-2.0 mg/d)	

Table 17: Treatment of anxiety – drugs, doses and indications

Conclusion

Psychiatric emergencies in children and adolescents are frequent occurrences in routine clinical practice. The first contact of children and adolescents with psychiatric emergencies may not be mental health professionals but they are the ones contacted for immediate consultation. Thus, all professionals dealing with children and adolescents should be equipped with the knowledge and process for assessment and management of psychiatric emergencies in children and adolescents. Thus, this guideline provides a framework for assessment and effective management of various psychiatric emergencies in this population and gives direction on effectively managing them. It enables the psychiatrist to ensure safety, thorough assessment and investigations, allow risk assessment, standardized care, identify risk factors, perpetuating factors and triggers. A step wise approach as elucidated in the guideline allows for a comprehensive assessment and ensuring effective treatment, using both pharmacological and non-pharmacological methods. Assessment of biological, social and psychological factors identified as a part of holistic assessment aid in formulating long term plans and interventions for optimal outcomes.

References:

1. Benarous X, Milhiet V, Oppetit A, Viaux S, El Kamel NM, Guinchat V et al. Changes in the use of emergency care for the youth with mental health problems over decades: a repeated cross sectional study. Frontiers in psychiatry 2019;10:26

2. Hoge MA, Vanderploeg J, Paris M, Lang JM, Olezeski C.. Emergency department use by children and youth with mental health conditions: a health equity agenda. Community Mental Health Journal 2022;1-15.

3. Leon SL, Cloutier P, Polihronis C, Zemek R, Newton AS, Gray C et al. Child and adolescent mental health repeat visits to the emergency department: a systematic review. *Hospital pediatrics* 2017;*7*(3):177-186.

4. Boyer L, Henry JM, Samuelian JC, Belzeaux R, Auquier P, Lancon C, Da Fonseca D. Mental Disorders among Children and Adolescents Admitted to a French Psychiatric Emergency Service. Emerg Med Int. 2013;2013:651530. doi: 10.1155/2013/651530. Epub 2013 Jan 28. PMID: 23431454; PMCID: PMC3568896.

5. Thom RP. Pediatric Delirium. Am J Psychiatry Residents Journal 2017; doi.org/10.1176/appi.ajp-rj.2017.120203

6. Bettencourt A, Mullen JE. Delirium in children: Identification, prevention and management. Critical Care Nurse 2017;37(3):e9-e18

7. Israni AV, Kumar S, Hussain N. Fifteen- minute consultation: an approach to a child presenting to the emergency department with acute psychotic symptoms. Arch Dis Child Educ Pract Ed 2017;0)1-5. doi:10.1136/archdischild-2017-313386

8. Ranney ML, Patena JV, Nugent N, Spirito A, Boyer E, Zatzick D, Cunningham R. PTSD, cyberbullying and peer violence: prevalence and correlates among adolescent emergency department patients. Gen Hosp Psychiatry. 2016 Mar-Apr;39:32-8. doi: 10.1016/j.genhosppsych.2015.12.002. Epub 2015 Dec 18. PMID: 26786845; PMCID: PMC4779373

9. Fahimi J, Aurrecoechea A, Anderson E, Herring A, Alter H. Substance abuse and mental health visits among adolescents presenting to US emergency departments. Pediatr Emerg Care. 2015 May;31(5):331-8. doi: 10.1097/PEC.0000000000000421. PMID: 25875990; PMCID: PMC4417003.

10. Padhy S, Chauhan N. Assessment and management of mental health problems in pediatric setting. Eds: Chadda RK, Sood M, Sarkar S. Handbook of Consultation Liaison Psychiatry. An Official Publication of Dept. of Psychiatry & NDDTC, AIIMS, New Delhi & Indian Asso Social Psychiatry. 2020

11. White J, British Columbia Ministry of Children and Family Development 2014. Practice guidelines for working with children and youth at-risk for suicide in community mental health settings.

12. Cwik MF, O'Keefe VM, Haroz EE. Suicide in the pediatric population: screening, risk assessment and treatment. International review of psychiatry. 2020;32(3):254-64.

13. Horowitz LM, Bridge JA, Teach SJ, Ballard E, Klima J, Rosenstein DL, Wharff EA, Ginnis K, Cannon E, Joshi P, Pao M. Ask Suicide-Screening Questions (ASQ): a brief instrument for the pediatric emergency department. Archives of pediatrics & adolescent medicine. 2012 Dec 1;166(12):1170-6.

14. Fader RP, Mroczkowski MM. Child and adolescent psychiatric emergencies. In Rey JM & Martin A (eds), JM Rey's IACAPAP e-Textbook of Child and Adolescent Mental Health. Geneva: International Association for Child and Adolescent Psychiatry and Allied Professions 2020.

15. Substance Abuse and Mental Health Services Administration (SAMHSA): Treatment for Suicidal Ideation, Self-harm, and Suicide Attempts Among Youth. SAMHSA Publication No. PEP20-06-01-002 Rockville, MD: National Mental Health and Substance Use Policy Laboratory. Substance Abuse and Mental Health Services Administration, 2020.

16. Card ST. Suicide Assessment Five-Step Evaluation and Triage for Clinicians. Rockville, MD. Substance Abuse and Mental Health Services Administration. 2009.

17. Poudel A, Lamichhane A, Magar KR, Khanal GP. Non suicidal self injury and suicidal behavior among adolescents: co-occurrence and associated risk factors. BMC Psychiatry. 2022 Dec;22(1):1-2.

18. Pompili M, Goracci A, Giordano G, Erbuto D, Girardi P, Klonsky ED, Baldessarini RJ. Relationship of non-suicidal self-injury and suicide attempt: a psychopathological perspective. J Psychopathol. 2015 Dec 1;21(4):348-53.

19. Gurnani T, Ivanov I, Newcorn JH. Pharmacotherapy of aggression in child and adolescent psychiatric disorders. Journal of child and adolescent psychopharmacology. 2016 Feb 1;26(1):65-73.

20. Lemmens JS, Valkenburg PM, Peter J. The effects of pathological gaming on aggressive behavior. J Youth Adolesc. 2011 Jan;40(1):38-47.

21. Adesanya DO, Johnson J, Galanter CA. Assessing and treating aggression in children and adolescents. Pediatr Med 2022;5:18.

22. Buchmann A, Hohmann S, Brandeis D, Banaschewski T, Poustka L. Aggression in children and adolescents. Neuroscience of aggression. 2013:421-42.

23. Smith HAB, Brink E, Fuchs DC, Ely EW, Pandharipande PP. Pediatric delirium: monitoring and management in the pediatric intensive care unit. Pediatr Clin North Am 2013;60(3):741-760.

24. Al-Biltagi M, Sarhan EA. Anxiety disorder in children: review. J. Paedi. Care. Inol. 2016;1(1):18-28.

25. Wehry AM, Beesdo-Baum K, Hennelly MM, Connolly SD, Strawn JR. Assessment and treatment of anxiety disorders in children and adolescents. Current psychiatry reports. 2015 Jul;17(7):1-1.

26. Silberg J. Guidelines for the Evaluation and Treatment of Dissociative Symptoms in Children and Adolescents: ISSD Task Force on Children and Adolescents, July 2000.

27. Walter HJ, Bukstein OG, Abright AR, Keable H, Ramtekkar U, Ripperger-Suhler J, Rockhill C. Clinical Practice Guideline for the Assessment and Treatment of Children and Adolescents with Anxiety Disorders. J Am Acad Child Adolesc Psychiatry. 2020 Oct;59(10):1107-1124.

28. Agarwal V, Sitholey P, Srivastava C. Clinical practice guidelines for the management of dissociative disorders in children and adolescents. Indian Journal of Psychiatry. 2019 Jan;61(Suppl 2):247.

29. Shaffer D, Pfeffer CR. Practice parameter for the assessment and treatment of children and adolescents with suicidal behavior. Journal of the American Academy of Child & Adolescent Psychiatry 2001;40(7):24S-51S.

30. Reynolds WM. Suicidal ideation questionnaire (SIQ). Odessa, FL: Psychological Assessment Resources. 1987.

31. Tatman SM, Greene AL, Karr LC. Use of the Suicide Probability Scale (SPS) with adolescents. Suicide and Life-Threatening Behavior. 1993;23(3):188-203.

32. Posner K, Brown GK, Stanley B, Brent DA, Yershova KV, Oquendo MA, Currier GW, Melvin GA, Greenhill L, Shen S, Mann JJ. The Columbia-Suicide Severity Rating Scale: initial validity and internal consistency findings from three multisite studies with adolescents and adults. Am J Psychiatry. 2011 Dec;168(12):1266-77.

33. Achenbach TM. Manual for the Child Behavior Checklist/4-18 and 1991 profile. University of Vermont, Department of Psychiatry. 1991.

34. Achenbach TM, Dumenci L, Rescorla LA. Ratings of relations between DSM-IV diagnostic categories and items of the CBCL/6-18, TRF, and YSR. Burlington, VT: University of Vermont. 2001:1-9.

35. Sorgi P, Ratey J, Knoedler DW, Market RJ, Reichman M. Rating aggression in the clinical setting: A retrospective adaptation of the Overt Aggression Scale: Preliminary results. J Neuropsychiatry Clin Neurosci 1991 3:S52–S56.

36. Stanford MS, Houston RJ, Mathias CW, Villemarette-Pittman NR, Helfritz LE, Conklin SM. Characterizing aggressive behavior. Assessment. 2003 Jun;10(2):183-90.

37. Halperin JM, McKay KE, Grayson RH, Newcorn JH. Reliability, Validity, and Preliminary Normative Data for the Children's Aggression Scale–Teacher Version. Journal of the American Academy of Child & Adolescent Psychiatry. 2003 Aug 1;42(8):965-71.

38. Halperin JM, McKay KE, Newcorn JH. Development, reliability, and validity of the children's aggression scale-parent version. Journal of the American Academy of Child & Adolescent Psychiatry. 2002 Mar 1;41(3):245-52.

39. Janssen NJ, Tan EY, Staal M, et al. On the utility of diagnostic instruments for pediatric delirium in critical illness: an evaluation of the Pediatric Anesthesia Emergence Delirium Scale, the Delirium Rating Scale 88, and the Delirium Rating Scale-Revised R-98. Intensive Care Med. 2011; 37(8):1331-1337.

40. Silver G, Traube C, Kearney J, et al. Detecting pediatric delirium: development of a rapid observational assessment tool. Intensive Care Med. 2012;38(6):1025-1031.

41. Traube C, Silver G, Kearney J, et al. Cornell Assessment of Pediatric Delirium: a valid, rapid, observational tool for screening delirium in the PICU. Crit Care Med. 2014;42(3):656-663.

42. Silver G, Kearney J, Traube C, Hertzig M. Delirium screening anchored in child development: the Cornell Assessment for Pediatric Delirium. Palliat Support Care. 2015;13(4):1005-1011.

43. Smith HA, Gangopadhyay M, Goben CM, et al. The Preschool Confusion Assessment Method for the ICU: valid and reliable delirium mon- itoring for critically ill infants and children. Crit Care Med. 2016;44(3): 592-600.

44. Smith HA, Berutti T, Brink E, et al. Pediatric critical care perceptions on analgesia, sedation, and delirium. Semin Respir Crit Care Med. 2013; 34(2):244-261.

45. Smith HA, Boyd J, Fuchs DC, et al. Diagnosing delirium in critically ill children: validity and reliability of the Pediatric Confusion Assessment Method for the Intensive Care Unit. Crit Care Med. 2011;39(1):150-157.

46. Ista E, van Beusekom B, van Rosmalen J, Kneyber MCJ, Lemson J, Brouwers A, Dieleman GC, Dierckx B, de Hoog M, Tibboel D et al: Validation of the

SOS-PD scale for assessment of pediatric delirium: a multicenter study. Crit Care 2018, 22(1):309

47. Overall JE, Pfefferbaum B. The Brief Psychiatric Rating Scale for Children. Psychopharmacol Bull 1982; 18: 10–16.

48. Massachusetts General Hospital, Pediatric Symptom Checklist. Available at: https:// www.massgeneral.org/psychiatry/treatments-and-services/pediatric-symptom-checklist/. Accessed July 29, 2020

49. Wei C, Hoff A, Villabø MA, Peterman J, Kendall PC, Piacentini J, McCracken J, Walkup JT, Albano AM, Rynn M, Sherrill J. Assessing anxiety in youth with the multidimensional anxiety scale for children. Journal of Clinical Child & Adolescent Psychology. 2014 Jul 1;43(4):566-78.

50. University of Pittsburgh. Screen for Child Anxiety Related Disorders (SCARED). Available at: https://www.pediatricbipolar.pitt.edu/resources/instruments. Accessed July 29, 2020.

51. Spence Children's Anxiety Scale. Available at: https://www.scaswebsite.com. Accessed July 29, 2020.

52. Rotheram-Borus MJ, Piacentini J, Van Rossem R, Graae F, Cantwell C, Castro-Blanco D, Miller S, Feldman J. Enhancing treatment adherence with a specialized emergency room program for adolescent suicide attempters. J Am Acad Child Adolesc Psychiatry. 1996 May;35(5):654-63.

53. Plener PL, Kaess M, Schmahl C, Pollak S, Fegert JM, Brown RC: Nonsuicidal self-injury in adolescents. Dtsch Arztebl Int 2018; 115: 23–30.

54. King C. A computerized adaptive screen for suicidal youth (CASSY): development in the ED STARS national sample. Journal of the American Academy of Child & Adolescent Psychiatry 2019; 58(10), p.S305.

55. Kim S, Rush BS, Rice TR. A systematic review of therapeutic ketamine use in children and adolescents with treatment-resistant mood disorders. European Child & Adolescent Psychiatry. 2021 Oct;30(10):1485-501.

56. Grover S, Avasthi A. Clinical practice guidelines for the management of depression in children and adolescents. Indian J Psychiatry 2019;61:226-40.

57. Scotto Rosato N, Correll CU, Pappadopulos E, Chait A, Crystal S, Jensen PS; Treatment of Maladaptive Aggressive in Youth Steering Committee.

Treatment of maladaptive aggression in youth: CERT guidelines II. Treatments and ongoing management. Pediatrics. 2012 Jun;129(6):e1577-86.

58. Chun TH, Mace SE, AAP FACEP, Katz ER. Evaluation and Management of Children and Adolescents With Acute Mental Health or Behavioral Problems. Part I: Common Clinical Challenges of Patients With Mental Health and/or Behavioral Emergencies. Pediatrics. 2016;138(3):e20161570.

59. Pappadopulos E, Macintyre Ii JC, Crismon ML, Findling RL, Malone RP, Derivan A, Schooler N, Sikich L, Greenhill L, Schur SB, Felton CJ. Treatment recommendations for the use of antipsychotics for aggressive youth (TRAAY). Part II. Journal of the American Academy of Child & Adolescent Psychiatry. 2003 Feb 1;42(2):145-61.

60. Lampropoulou P, Siomos K, Floros G, Christodoulou N. Effectiveness of Available Treatments for Gaming Disorders in Children and Adolescents: A Systematic Review. Cyberpsychology, Behavior, and Social Networking. 2022 Jan 1;25(1):5-13.

61. Inouye SK: Delirium in older persons. NEJM 2006; 354:1157–1165

62. Turkel SB, Tavare CJ: Delirium in children and adolescents. J Neuropsychiatry Clin Neurosci 2003; 15(4):431-435

63. Hatherill S, Flisher AJ. Delirium in children and adolescents: a systematic review of the literature. J Psychosom Res. 2010;68(4):337-344; Turkel SB, Hanft A. The pharmacologic management of delirium in children and adolescents. Paediatr Drugs. 2014;16(4):267-274

64. Van Tuijl SG, Van Cauteren YJ, Pikhard T, Engel M, Schieveld JN. Management of pediatric delirium in critical illness: a practical update. Minerva Anestesiol. 2015;81(3):333-341.

65. Bettencourt A, Mullen JE. Delirium in Children: Identification, Prevention, and Management. Crit Care Nurse. 2017 Jun;37(3):e9-e18.

66. Laudone TW, beck SD, Lahr HJ. Evaluation of melatonin practices for delirium in pediatric critically ill patients. J Pediatr Pharmacol Ther 2021;26(4):361-365.

67. Sorrentino A. Chemical restraints for the agitated, violent, or psychotic pediatric patient in the emergency department: controversies and recommendations. Curr Opin Pediatr 2004;16:201-5.

68. Srinath S, Jacob P, Sharma E, Gautam A. Clinical practice guidelines for assessment of children and adolescents. Indian journal of psychiatry. 2019 Jan;61(Suppl 2):158.

69. Ian Kodish, Carol Rockhill & Chris Varley (2011) Pharmacotherapy for anxiety disorders in children and adolescents, Dialogues in Clinical Neuroscience, 13:4, 439-452.

Algorithm 1: Management of suicidal patient

Algorithm 1: Management of suicidal patient

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┌─────────────────────────────┐
│ Suspected aggression        │
└─────────────────────────────┘
               ↓
┌─────────────────────────────────────────────────────────────────────┐
│ Assessment– type, risk factor, comprehensive assessment              │
│ Development of therapeutic alliance                                   │
│ Interviewing the parent/guardian separately                          │
│ Rule in/out psychopathology (Identification, analysis, evaluation    │
│ and treatment of risks; psychological, social risk factors and       │
│ other factors resulting and perpetuating aggression)                 │
│ Track symptoms from baseline with rating scales                      │
└─────────────────────────────────────────────────────────────────────┘
               ↓
┌──────────────────────────────┐        ┌──────────────────────────────┐
│ Develop therapeutic alliance │   →    │ Non pharmacological          │
│ Decide treatment settings    │        │ management                   │
│ Treat the underlying         │        │ •Patient centered programs   │
│ psychiatric disorder         │        │ •Child centered programs     │
└──────────────────────────────┘        │ •Family centered programs    │
               ↓                        │ •Multisystemictherapy        │
┌───────────────────────────────────┐   │ •Treatment Foster Care       │
│ Ensure safety                     │   │ Oregon                       │
│ Pharmacological approach          │   │ •Behavior therapy            │
│ (Stimulants, Alpha agonists,      │   │ •therapy                     │
│ SSRIs, Atypicalantipsychotics,    │   └──────────────────────────────┘
│ valproate, Lithium)               │
│ Restraints                        │
│ Treatment of the underlying       │
│ psychiatric condition             │
│ Ensure stabilization before       │
│ discharge                         │
└───────────────────────────────────┘
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Algorithm 2: Management of aggressive patient

Algorithm 2: Management of aggressive patient

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┌─────────────────────────────────────────────────────────────┐
│  Child with acute confusional state and/or psychotic symptoms │
└─────────────────────────────────────────────────────────────┘
                              ↓
┌─────────────────────────────────────────────────────────────┐
│  Assess sensorium/behavioural features of delirium/psychotic symptoms │
└─────────────────────────────────────────────────────────────┘
                              ↓
┌──────────────────────────────────────────────────────────────────────┐
│  Stabilization: airway, breathing, circulation; Safety: chemical & physical restraint (if severe agitation present) │
└──────────────────────────────────────────────────────────────────────┘
                              ↓
┌─────────────────────────────────────────┐
│      Check blood glucose & electrolytes  │
└─────────────────────────────────────────┘
                              ↓
┌─────────────────────────────────────────────┐
│  Physical examination & neurological examination │
└─────────────────────────────────────────────┘
              ↙                          ↘
┌────────────────────────────┐   ┌────────────────────────────┐
│ Focal neurological deficit │   │ No focal neurological      │
│ present                    │   │ deficit present            │
└────────────────────────────┘   └────────────────────────────┘
```

1st line of investigations (guided by clinical presentation)

CT head; MRI brain in case of head injury/stroke/intracranial space occupying leision

Complete hemogram; renal function test, liver function test, thyroid function test, serum ammonia , toxicology screen, lumbar puncture, EEG

Abnormalities in investigations + altered sensorium

Consider diagnosis of delirium

Pharmacological Rx if severe agitation present; Non pharmacological management

Sensorium preserved; no abnormality in investigations so far

Pediatric neurologist referral; plan 2nd line of investigations

Autoimmune encephalitis- Anti- NMDAR, Anti TPO; Porphyria- urinary porphobilinogen; Wilson's disease- Serum ceruloplasmin

Organic cause found

No Organic cause found

Rx of underlying medical condition; low dose psychotropics for psychiatric Sx

Consider primary psychiatric illness; Rx as per guidelines

Algorithm 3: Diagnostic approach to a child presenting with altered behaviour/ psychotic symptoms

```
                    ┌─────────────────────┐
                    │      Symptoms       │
                    │   suggestive of     │
                    │      Anxiety        │
                    └─────────────────────┘
                              │
                              ▼
┌──────────────────────────┐    ┌────────────────────────────────┐
│ Investigate if required  │    │ Rule out physical illness as   │
│ EEG (Video EEG) IQ test  │    │ cause Assess for               │
│ Urine drug screen Neuro  │    │ Comorbid psychiatric or        │
│ imaging Blood tests      │    │ physical disorder              │
└──────────────────────────┘    │ Family functioning, parenting  │
                                 │ Presence of psychiatric/       │
                                 │ physical disorder in family    │
                                 │ member                         │
                                 │  Temperament of the child      │
                                 │  Psychosocial stressors        │
                                 └────────────────────────────────┘
                              │
                              ▼
              ┌──────────────────────────────────┐
              │   Diagnosis of Anxiety Disorder   │
              └──────────────────────────────────┘
                              │
┌──────────────────────┐      │
│ Hospitalize if       │      │
│ Severe symptoms      │      │
│ Chronic symptoms     │      │
│ Treatment resistance │      │
└──────────────────────┘      │
                              ▼
      ┌──────────────────────────────────────────────────┐
      │ Treatment                                         │
      │ Psycho education of the family and the child      │
      │ Behavioural management of the child               │
      │ Management of psychosocial stressors              │
      │ Medication for concomitant anxiety depression     │
      │ or behavioural problems                           │
      │ CBT for chronic dissociative disorders            │
      └──────────────────────────────────────────────────┘
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Algorithm 4: Management approach to a child presenting with Anxiety symptoms

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                        ┌─────────────────────────────┐
                        │      Anxiety/agitation       │
                        └─────────────────────────────┘
```

Anxiety/agitation

- **Impending delirium**
  - Treat as discussed earlier

- **Substance use or withdrawal**
  - Treat as per history of use and reports of toxicity study
  - Usually lorazepam and if required haloperidol

- **Autism or delayed development**
  - Assess history of pain, discomfort, what usually pacifies child and response to previous medication
  - Use sensory tools, behaviour modification and if severe lorazepam, diphenhydramine

- **Worsening of a known psychiatric disorder**
  - Assess history and previous records. Treat accordingly
  - Anxiety/trauma/PTSD use lorazepam or clonidine
  - ADHD /ODD/CD besides above may require risperidone or other APD
  - Agitated catatonia: use lorazepam
  - Psychosis treat as described earlier

- **Medical or neurological causes**
  - Thorough history, physical examination and investigations as appropriate
  - Treat as per aetiology

- **Unknown causes**
  - Try to ascertain cause
  - Symptomatically can be treated with Behavioural de escalation, diphenhydramine, lorazepam or APD

Algorithm 5: Management of a child presenting with anxiety and agitation

ASSESSMENT AND MANAGEMENT OF ANXIETY AND PANIC DISORDERS IN EMERGENCY SETTING

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INTRODUCTION

Anxiety disorders, primarily characterized by pathological anxiety, are very common in general population with estimates ranging from 20 to 30 percent, and lifetime prevalence rate is calculated at 16.6 per cent[1]. It is to be noted that pathological anxiety is experienced as more intense and exaggerated which arises without any real threat.

The word anxiety was taken from the Latin word "anxieta" denoting disturbance in about an uncertain event, and the Greek root "anxo" meaning to squeeze, strangle, or press tight.[2]

Anxiety is an unpleasant emotional state that is associated with psychophysiological changes as a result of an intrapsychic conflict. Anxiety disorder is a disorder in which the most prominent disturbance is anxiety or in which patients experience anxiety when they refuse to give in to their symptoms.[3]

Panic is an acute, intense attack of anxiety associated with disorganization in personality.It is characterized by overwhelming anxiety and feelings of impending doom. Panic attack is an acute intense anxiety episodewhich occurs in panic disorder, major depression, schizophrenia,and somatization disorder. Panic disorder is characterized by acute and intense anxiety attacks in the presence or absence of agoraphobia.[3]

The onset of panic symptoms is often spontaneous and rapid. Many patients seek help in an emergency department because of these characteristics, combined with its overwhelming intensity.[4]

Anxiety related complaints are commonly associated with alcohol & substance abuse, which complicates assessment of emergency physician.[5]

Panic disorders & exacerbations of previous acute stress symptoms are common patient presentations in the emergency department for primary anxiety disorders. Individuals with anxiety disorders may feel debilitated during an anxiety attack and feelembarrassed after the episode. In order to support the patient both during and after the anxiety episode, it is essential for emergency physicians to identify anxiety and panic disorders.[6] Table 1 outlines clinical predictors of anxiety caused by an underlying medical disorder.

Table 1: Predictors of Anxiety Caused by an Underlying Medical Issue[7]
1. Onset after age of 35 years
2. Absence of personal or family history of an anxiety disorder
3. Absence of history of significant anxiety, phobias, or separation anxiety in childhood
4. Absence of avoidance behavior
5. Absence of significant life events exacerbating the anxiety symptoms
6. Poor response to antianxiety drugs

CLINICAL FEATURES

In ED, anxiety presentations may be classified into 4 groups:[8]

A. Primary psychiatric illness, such as generalized anxiety disorder
B. Response to a stress or stressful events, such as acute stress disorder
C. Medical conditions or substance abuse that mimic the symptoms of anxiety, such as hyperthyroidism
D. Anxiety disorder comorbid with anotherphysical or mental illness

Six stages of development have been identified for panic disorder, with stage 1 or stage 2 being the most common for patients. Table 2 outlines various stages of panic disorder. Stage progression is associated with increasing degrees of disability and corresponding treatment implications.[9] It is believed that the disorder is less likely to worsen if the diagnosis is made in stage 1 or 2 and treated.[10]

Table 2: Stages of panic disorder[11]		
STAGES		
I	Limited symptom attack	Patients display <4 symptoms necessary for diagnosis of panic disorder.
II	Panic attack	Patients meet the definition of panic disorders with appropriate duration, frequency, and ≥4 symptoms.
III	Hypochondrias	Patient becomes preoccupied with concerns

		about medical illness, despite medical assurances. The panic attacks may become associated with environmental stimuli. This is known as phobic avoidance behavior. Driving and going to stores or shopping malls are the most frequent fears.
IV	Agoraphobia	
V	Extensive phobic avoidance	
VI	Secondary depression	It is believed to be due to from progressive disability and demoralization.

The main differentiating feature of panic disorder is the combination of physical and cognitive symptoms. It is rapid in onset which reaches its peak within 10 minutes and the attack around 1 hour. The typical patient experiences 2-4 attacks per week, commonly accompanied by anticipatory anxiety.[12]

Panic attack is a brief period of intense fear or discomfort in which ≥4 of the following signs or symptoms occur abruptly and peak within 10 minutes[13]:
- Feeling of choking
- Nausea or abdominal distress
- Feeling of dying
- Feeling of losing control or going crazy
- Chills or hot flushes
- Palpitations, pounding heart, or accelerated heart rate
- Chest pain or discomfort
- Trembling or shaking
- Sweating
- Parathesis
- Feeling dizzy, unsteady, light headed, or faint
- Sensation of shortness of breath or smothering
- Derealization or depersonalization

Table 3 outlines the typical and atypical symptoms of panic attacks

Table3: Typical and atypical symptoms of panic Attacks[14]	
TYPICAL SYMPTOMS	**ATYPICAL SYMPTOMS**
Trembling, shaking	Shaking rigor
Tachycardia, palpitations "Atypical" chest pain chest pain	Vice-like/crushing chest pain Pleuritic chest pain
Dyspnoea	Stridor

Sweating	Diaphoresis
Dizziness, lightheaded feeling	True vertigo, syncope
Nausea, abdominal distress	Vomiting
Dry mouth Choking sensation	Mechanical inability to swallow
Subjective weakness in arms and legs	Objective muscular weakness Overt lack of coordination
Flushes or chills	Fever, rash or generalized erythema
Fear of losing control or other "irrelevant" catastrophe	Bizarre behaviour (unrelated to fear of the attack)
Depersonalization, derealization	Disorientation to time, place, or person

Panic disorder: Recurrent, sudden panic attacks that are followed by a minimum of 1 month of persistent concern about having another panic attack, worry about the potential implications or consequences of the attacks, or a significant change in behaviour related to the attacks.[12]

MEDICAL CONDITIONS ASSOCIATED WITH ANXIETY

Sincemedical illnesses and anxiety share a bidirectional relationship, various medical conditions can cause secondary anxietyranging from normal psychological responses to illness to intense anxiety or preoccupation regarding somatic sensations, which leads to functional impairment. Negative emotions, such as anxiety, fear, sadness, and anger can be evoked after being diagnosed with severe, chronic or debilitating medical conditions.

Conditions in which anxiety is more common are hyperthyroidism, cardiac arrythmias, vestibular dysfunction, seizure disorders and hypoglycemia. Less commonly seen in pulmonary embolus, hyperparathyroidism, hypoparathyroidism, Cushing syndrome, phaeochromocytoma, menopause/estrogen deficiency and electrolyte disturbance. Table 4 outlines the medical conditions that may cause anxiety.

Table4: Medical conditions that may cause anxiety[15]	
SYSTEM	CONDITIONS
Cardiovascular diseases	Hypotension, hypertension, CHF, acute chest pain, acute myocardial infarction, anemia, angina, arrythmias, hypovolemia
Respiratory	Asthma, acute and chronic bronchitis, COPD, Pneumonia, hyperventilation, sleep apnea
Metabolic syndrome	Hypocalcemia, hypokalemia, porphyria, pellagra, uremia
Endocrine disorders	Pituitary dysfunction, hyperthyroidism,

	hypothyroidism, parathyroid dysfunction, hyperadrenocorticism, pheochromocytoma, hypoglycemia, virilization disorders in females, premenstrual syndrome
Neurologic disorders	Cerebrovascular disease, cerebral neoplasm, encephalitis, migraines, subarachnoid hemorrhage, closed head injuries, multiple sclerosis, Wilson disease, vestibular dysfunctions, dementia, delirium, Huntington's disease, temporal lobe diseases, seizure disorders, psychomotor epilepsy
Inflammatory disorders	Rheumatoid arthritis, Systemic lupus erythematosus, temporal arteritis, fibromyalgia, allergic reactions
Toxicity	Caffeine intoxication, amphetamines, heavy metals, vasopressors and sympathomimetic agents, organophosphates, alcohol, opiates, phencyclidines, cocaine, ecstasy
Infectious and other diseases	Septicemia, Carcinoid syndrome, Infectious mononucleosis, AIDS, systemic malignancies, subacute bacterial endocarditis, gastrointestinal hemorrhage
Miscellaneous	Irritable bowel syndrome, dyspepsia, GERD, shingles (herpes zoster)
AIDS, acquired immunodeficiency syndrome; CHF, congestive heart failure; COPD, chronic obstructive pulmonary disease; GERD, gastroesophageal reflux disease; HIV, human immunodeficiency virus	

Management of panic disorder:

Assessment:

Patients with panic disorder or anxiety usually present to the emergency department with somatic symptoms of breathlessness, palpitations, chest pain etc. It is not uncommon for them to be diagnosed as having an acute respiratory or cardiac event or any other physical illness. Even though the patientis having a panic attack, it is highly essential to rule out allthe acute physical emergencies. A proper history taking along withcareful physical examination of the vital parameters and certain basic investigations help the emergency physician to rule out a physical illness.

These include measurement of vital data like blood pressure, oxygen saturation, pulse rate and characteristics, respiratory rate. Haematological investigations like complete blood

counts,serum electrolytes, blood glucose level, arterial blood gas analysis, thyroid function tests, renal function tests are to be done. Electrolyte abnormalities like reduced ionized calcium and serum phosphate levels are usually seen in patients with hyperventilation. Electrocardiogram to rule out any acute cardiac abnormalities can be done.

Point of Care Ultrasonography of the lungs, Bed-side X-ray of the Chest and Peak flowmetry to rule out any respiratory abnormalities are advisable.A toxicological screening to rule out any drug abuse is also helpful in an emergency setting. After ruling out the possible physical causes, the patient could be diagnosed with a panic disorder or an anxiety disorder.

Application of DSM-V or ICD-10 guidelines in an emergency setting could be difficult due to unavailability of a psychiatrist in the emergency department. This could lead to under-diagnosing or mis-diagnosing the panic disorder. Hence, using certain screening tools that can be applied by an emergency physician or any general physician could be useful in diagnosing a patient with panic or anxiety disorders.

Screening Tools:

Following are some of the available screening tools that can be used by physicians or primary care doctors in an emergency setting:

Anxiety Disorder	Panic Disorder
Anxiety Disorder Diagnostic Questionnaire[16]	Panic Disorder Self Report[20]
Generalized Anxiety Disorder -7[17]	Panic Disorder Severity Scale[21]
Beck Anxiety Inventory[18]	Panic and Agoraphobia Scale[22]
Hamilton Anxiety Rating Scale[19]	NIMH Panic Questionnaire[23]
	Panic associated symptoms scale[24]

Table 5: Screening tools for Anxiety/Panic disorder

Treatment in an emergency setting: After careful history taking and a careful assessment, patients can be diagnosed with a physical illness or with an anxiety or a panic disorder. If the patient is found to have a physical illness, he or she can be treated by the emergency physician immediately and later referred to the concerned specialist physician. If the patient is found to have a psychogenic panic attack or an anxiety disorder, he can be treated by the emergency

physician to subvert the crisis situation and then referred to a psychiatrist. However, it is not uncommon for patients diagnosed with primary mental illness to have an underlying medical condition and should be taken into consideration while treating the patient.Patients can be treated using both pharmacological and non-pharmacological measures.

Pharmacotherapy: The most important step in the management is to abort the panic attack.Abenzodiazepine with rapid onset of action is the choice of pharmacotherapy. Alprazolam, Lorazepam and Clonazepam are used to treat the anxiety/panic symptoms. Alprazolam is usually stated at a low dose of 0.25mg TID, but doses of 4mg/day or more may be, required[25]. The initial starting dose of lorazepam is 2-3mg, can repeat the dose two to three times per day with maximum dose of 10 mg/day[26]. It can also be administered intravenous (IV) or intramuscular (IM) injection (2mg/mL solution and 4mg/mL solution). The onset of its action is 1-3 minutes if administered IV and 15-30 minutes if administered IM. Clonazepam is given orally at a starting dose of 0.25mgcan be used with a maximum dose of 4mg/day. Abrupt cessation of the benzodiazepines might lead to withdrawal and hance careful tapering of the medication must be done. Caution must be taken with the use of long-term benzodiazepines due to its dependence potential.

In the long-term management of anxiety/ panic disorder, SSRIs are the first line medications. Examples of SSRIs approved by the FDA to treat panic disorder includes Escitalopram, Fluoxetine, Paroxetine and Sertraline. Even though all of them are equally effective, paroxetine is more commonly used because of its sedating property [27]. These medications must be titrated slowly and take several weeks to be effective. Adverse effects such as nausea, dizziness, headache, diarrhoea, constipation, tremors, agitation, and sexual dysfunction. Tricyclic Antidepressants include Imipramine, Clomipramine etc. SNRIs like Venlafaxine are also used in the treatment of panic disorder. A brief course of alprazolam can be prescribed in conjunction with an SSRI for short term management of panic disorder and should be slowly titrated when therapeutic actions of the SSRI become apparent (2-4weeks). Medications and their dosages used in panic disorder are summarized in the following table.

Drug	Initial Dose	Maintenance Dose
Benzodiazepines		
Alprazolam	0.25-0.5mgtid	0.5-2mg tid
Lorazepam	1-2 mg bid	1-2mg tid
Clonazepam	0.25-0.5mg bid	0.5-2mg bid
SSRI		
Paroxetine	5-10mg	20-60mg
Fluoxetine	20mg	20-60mg

Escitalopram	10mg	10-20mg
Sertraline	12.5-25 mg	50-200mg
TCA		
Clomipramine	5-12.5mg	50-125mg
Imipramine	10-25mg	150-500mg
Desipramine	10-25mg	150-200mg
SNRI		
Venlafaxine	6.25-25mg	50-150mg

Table 6: Medications used in anxiety/ panic disorder

Non – pharmacological therapy: Most panic attacksspontaneouslyresolve within half an hour, and patients can sometimes present with the attacks subsiding or with feelings of anticipatory anxiety. Therefore, during such an attack, the treating physician should reassure the patient and explain the brief nature of the illness. Psychoeducation of the patient and the caregivers regarding the course and prognosis of the illness helps in alleviating the anxiety. For further information on psychoeducation in the management of anxiety, refer to Clinical Practice Guidelines for Psychoeducation in Psychiatric Disorders General Principles of Psychoeducation[28].In the long term, psychotherapies such as cognitive behavioural therapy[29], interpersonal therapy, mindfulness therapycan beused to treat panic disorder, but also take effect after several weeks. Hence, health care providers in the emergency department should properly refer and education on general lifestyle recommendations to reduce and identify any anxiety-related symptoms, such as eliminate stimulants, obtain stimulants, obtain adequate sleep and exercise daily. In addition, relaxation techniques[30] can easily be administered in ED settings and have the potential to reduce anxiety. Deep breathing exercises[31], which involve consciously slowing respirations and focusing on taking regular and focusing on taking regular slow deep breaths has been shown to reduce anxiety or panic symptoms. Another strategy may include guided imagery[32], where the emergency physician encourages the patient to imagine a serene location free of stress. Both methods may have a profound effect on the anxiety of patients who present with a panic attack or known PD.

Role of emergency physicians:

Panic Disorder is relatively a common presentation in the primary care setting especially to an emergency department. Most of the patients have cardiac, gastrointestinal, ENT or neurological comorbidities. As the first point of contact with the patients, emergency physicians have an important role in the management of panic disorders. A holistic history & clinical assessment

are of paramount importance. Early recognition and management help to reduce both the morbidity and mortality. The emergency physician should be in a position to abate the panic attack & put in a referral to a psychiatrist especially if the patient has suicidality or any self-neglect or inadequate response to the primary intervention. Early referral decreases the overall cost in the assessment and management of panic disorders[33].
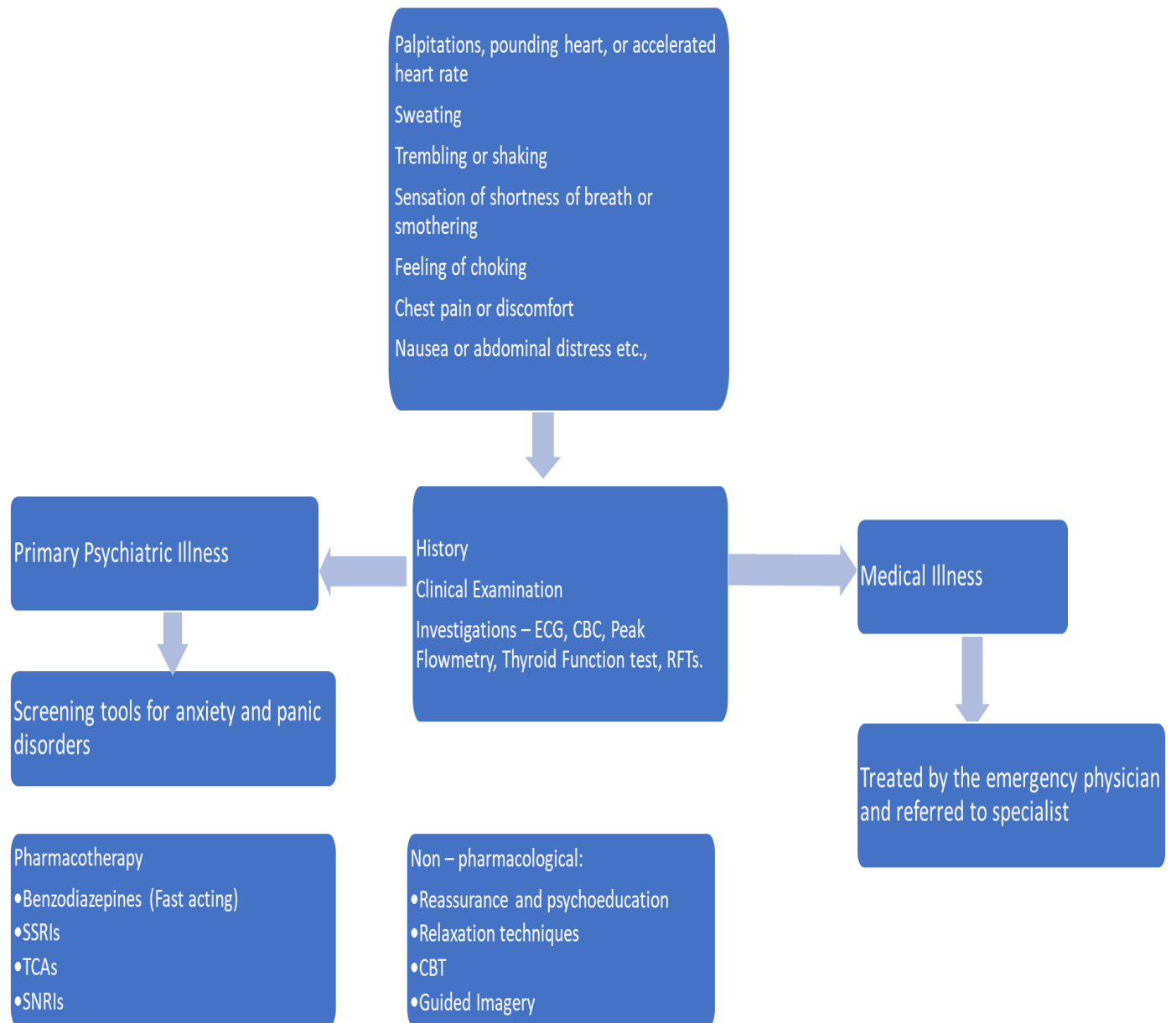
Figure 1: Algorithm depicting the management of patients presenting to the emergency department with anxiety/panic symptoms

SUMMARY

Anxiety/panic disorder is common in the general population and often present to the ED. The emergency physician must be able to identify the underlying cause for the presentation which could be either a primary mental illness or an underlying medical condition presenting with the symptoms of anxiety/panic disorder to initiate proper treatment. Basic investigations help in the assessment of the

symptoms. If the cause is an underlying medical illness, referral to the concerned specialist would be helpful and if symptoms are purely due to a primary mental illness, patient can be screened for an anxiety or panic disorder. Early and timely recognition of primary anxiety disorder helps in avoiding unnecessary investigationsand can be treated with both pharmacological and non-pharmacological options.The main aim is to calm down the patient and abort the panic attack. Benzodiazepines and SSRI remain the main stay of treatment.Reassurance and psychoeducation of the patient as well as his caregivers help a long way in the management of the symptoms. Judicious use of medication, patient education, and referral to a physician whenever necessary improve the outcome of patients with this otherwise potentially disabling disorder.

REFERENCES

1. Bandelow B, Michaelis S. Epidemiology of anxiety disorders in the 21st century. Dialogues in clinical neuroscience. 2022 Apr 1.
2. Sandeep K and Rajmeet S: Role of different neurotransmitters in anxiety: a systemic review. Int J Pharm Sci Res 2017; 8(2): 411-21
3. Sadock BJ, Sadock VA. Kaplan & Sadock's concise textbook of clinical psychiatry. Lippincott Williams & Wilkins; 2008.
4. Pollard CA, Lewis LM. Managing panic attacks in emergency patients. The Journal of emergency medicine. 1989 Sep 1;7(5):547-52
5. Felder ML, Perry MA. The patient with anxiety disorders in the emergency department. In: Zun LS, Chepenik LG, MNS M, editors. Behavioral emergencies for the emergency physician. Cambridge: Cambridge University Press; 2013. p. 76–82
6. Lentz C. Anxiety and Mood Disorders in an emergency Context. Big Book of Emergency Department Psychiatry. 2017 Sep 18:147-76.
7. Zun LS, Nathan JB. Anxiety disorders. Rosen's Emergency Medicine: Concepts and Clinical Practice. 7th ed. Philadelphia, Pa: Mosby Elsevier. 2009.
8. Marx J, Hockberger R, Walls R, (Eds.). Rosen's Emergency Medicine Concepts and Clinical Practice (7th Edition,Chapter 110). Philadelphia: Mosby/Elsevier; 2010: 1445–51.
9. Merritt TC. Recognition and acute management of patients with panic attacks in the emergency department. Emergency medicine clinics of North America. 2000 May 1;18(2):289-300.
10. Noyes R, Clancy J, Hoenk PR, Slymen DJ. The prognosis of anxiety neurosis. Archives of General Psychiatry. 1980 Feb 1;37(2):173-8.
11. Zun LS. Panic disorder: diagnosis and treatment in emergency medicine. Annals of emergency medicine. 1997 Jul 1;30(1):92-6.
12. Manjunatha N, Ram D. Panic disorder in general medical practice-A narrative review. Journal of Family Medicine and Primary Care. 2022 Mar;11(3):861-69.
13. American Psychiatric Association (2013). Diagnostic and Statistical Manual of Mental Disorders-5. Arlington, VA: American Psychiatric Publishing. doi:10.1176/appi.books.9780890425596

14. Pollard CA, Lewis LM. Managing panic attacks in emergency patients. The Journal of emergency medicine. 1989 Sep 1;7(5):547-52.
15. Tan DT. The Acutely Anxious Patient. Handbook of Emergency Psychiatry. 2007 Mar 9:214-33.
16. Norton PJ, Robinson CM. Development and evaluation of the anxiety disorder diagnostic questionnaire. Cognitive Behaviour Therapy. 2010 Jan 1;39(2):137-49.
17. Spitzer RL, Kroenke K, Williams JB, Löwe B. A brief measure for assessing generalized anxiety disorder: the GAD-7. Archives of internal medicine. 2006 May 22;166(10):1092-7.
18. Beck AT, Epstein N, Brown G, Steer R. Beck anxiety inventory. Journal of Consulting and Clinical Psychology. 1993.
19. Öst LG, Westling BE. Applied relaxation vs cognitive behavior therapy in the treatment of panic disorder. Behaviour Research and Therapy. 1995 Feb 1;33(2):145-58.
20. Newman MG, Holmes M, Zuellig AR, Kachin KE, Behar E. The reliability and validity of the panic disorder self-report: a new diagnostic screening measure of panic disorder. Psychological Assessment. 2006 Mar;18(1):49.
21. Shear MK, Rucci P, Williams J, Frank E, Grochocinski V, Vander Bilt J, Houck P, Wang T. Reliability and validity of the Panic Disorder Severity Scale: replication and extension. Journal of psychiatric research. 2001 Sep 1;35(5):293-6.
22. Bandelow B. Panic and Agoraphobia Scale (PAS). Hogrefe & Huber Publishers; 1999.
23. Scupi BS, Maser JD, Uhde TW. The National Institute of Mental Health Panic Questionnaire: An instrument for assessing clinical characteristics of panic disorder. Journal of Nervous and Mental Disease. 1992 Sep.
24. Argyle N, Deltito J, Allerup P, Maier W, Albus M, Nutzinger D, Ayuso JL, Bech P, Rasmussen S. The Panic-Associated Symptom Scale: measuring the severity of panic disorder. Acta Psychiatrica Scandinavica. 1991 Jan;83(1):20-6.
25. Locke AB, Kirst N, Shultz CG. Diagnosis and management of generalized anxiety disorder and panic disorder in adults. American family physician. 2015 May 1;91(9):617-24.
26. Vlastra W, Delewi R, Rohling WJ, Wagenaar TC, Hirsch A, Meesterman MG, Vis MM, Wykrzykowska JJ, Koch KT, de Winter RJ, Baan J, Piek JJ, Sprangers MAG, Henriques JPS. Premedication to reduce anxiety in patients undergoing coronary angiography and percutaneous coronary intervention. Open Heart. 2018;5(2):e000833.
27. Du Y, Du B, Diao Y, Yin Z, Li J, Shu Y, Zhang Z, Chen L. Comparative efficacy and acceptability of antidepressants and benzodiazepines for the treatment of panic disorder: A systematic review and network meta-analysis. Asian Journal of Psychiatry. 2021 Jun 1;60:102664.
28. Sarkhel S, Singh OP, Arora M. Clinical Practice Guidelines for Psychoeducation in Psychiatric Disorders General Principles of Psychoeducation. Indian Journal of Psychiatry. 2020;62(Suppl 2):S319.
29. Otto MW, Deveney C. Cognitive-behavioral therapy and the treatment of panic disorder: efficacy and strategies. J Clin Psychiatry. 2005 Jan 1;66(Suppl 4):28-32.

30. Ost LG, Westling BE. Applied relaxation vs cognitive behavior therapy in the treatment of panic disorder. Behav Res Ther 1995;33:145-58.
31. Taylor S. Breathing retraining in the treatment of panic disorder: Efficacy, caveats and indications. Scan J Beha Ther 2001;30:49-56.
32. Öst LG, Westling BE, Hellström K. Applied relaxation, exposure *in vivo* and cognitive methods in the treatment of panic disorder with agoraphobia. Behav Res Ther 1993;31:383-94.
33. Chen YH, Chen SF, Lin HC, Lee HC. Healthcare utilization patterns before and after contact with psychiatrist care for panic disorder. J Affect Disord2009;119:172-6.

Clinical practice guidelines for assessment and management of dissociative disorders presenting as psychiatric emergencies

ABSTRACT

Dissociative convulsions, dissociative disorders with motor symptoms, with sensory symptoms and possession states are some types of dissociative disorders commonly seen in an emergency setting. At present, there are no standardized guidelines for assessment and management of these disorders, hence the current guidelines were prepared. A thorough assessment with detailed history, physical examination to rule out a medical illness, mental status examination to diagnose concomitant psychiatric illness have to be conducted in the emergency settings. Bedside neurological tests and investigations are also used to differentiate between medical illness and dissociative disorders. Important rating scales have also been enlisted, which can be utilized. Management includes safety measures and symptom reduction using relaxation techniques, grounding techniques, psychoeducation. Importantly, pharmacological management does not from the first line of management.

INTRODUCTION

Dissociative disorders present in the emergency/casualty quite often. Commonly seen presentations in India include dissociative convulsions, motor symptoms, possession states, at times dissociative amnesia and dissociative fugue. Dissociative identity disorder is a very rare occurrence in the emergency setting. It is challenging to examine a patient with a dissociative disorder in the emergency setting, consider differential diagnoses, rule them out, and manage the acute symptoms. Lack of privacy and space, time available for assessment, risk of misdiagnoses are some of the drawbacks of managing dissociative disorders in casualty. A decision about inpatient or outpatient management needs to be made. One must also ensure that the patient follows up for further evaluation and long-term management. There are no standardized practices while dealing with dissociative disorders in emergency setting.

In 2007, Indian Psychiatric Society (IPS), published guidelines for management of dissociative disorders. This was followed by an update on management in child and adolescent age group in 2019 and one on psychological interventions in dissociative disorders in 2020. The current recommendations are primarily with respect to management of dissociative disorders presenting as psychiatric emergencies. These will help clinicians in

assessing, diagnosing, and treating dissociative disorders in an emergency setting. It is expected that these are tailored to suit individual needs by the clinicians.

EPIDEMIOLOGY

In a retrospective study by Naskar et al,[1] an analysis of patients being referred to Psychiatry was done. Patients were referred for "medically unexplained somatic complaints" (47.70%) or with "no physical illness was detected" in the patient (38.59%). Out of 1153 patients seen by Psychiatric emergency services, 43.45% received a diagnosis belonging to the ICD 10 category of F40-49, Neurotic, stress related and somatoform disorders.

A study by Chaturvedi et al,[2] gave the prevalence of dissociative disorders in inpatient setting as 1.5 to 11.6 per 1000 and in outpatient setting as 1.5 to 15 per 1000. The commonest diagnosis among outpatients was dissociative motor disorder 43.3%, followed by dissociative convulsions 23.0 % ad trance and possession disorder 11.5%. Dissociative stupor was diagnosed in 6.6%, Dissociative amnesia in 4.1%, mixed dissociative disorder 4.1%, other dissociative disorders 2.4%, dissociative fugue in 1.4% and dissociative anesthesia in 0.8%. Similarly, the commonest diagnoses among inpatients were dissociative motor disorder (37.7%), dissociative convulsions (27.8%) was the second most common followed by trance and possession disorders (5.3%) and dissociative stupor (5.3%). The unspecified dissociative disorders were seen in 6.3% patients.

Another retrospective analysis by Grover et al, [3] gave the prevalence of dissociative disorders as 53.9% amongst anxiety disorders presenting in the emergency services.

A study conducted by V. Senthil Kumar Reddi [4] in the emergency psychiatric and acute care service of NIMHANS, the prevalence of dissociative disorders was 11.5 per 1000. The commonest presentation was dissociative motor disorder, dissociative convulsions and mixed dissociative disorder.

Dissociative disorders have seen an evolution in the conceptualization and there are differences in DSM 5 and ICD 10 in the definition and diagnostic categories of dissociative disorders. Dissociative disorders according to ICD 10 are disorders characterized by having loss of the normal integration (Partial or Complete) between memories of the past, awareness of identity and immediate sensations and control of bodily movements. [5]

DSM 5 defines dissociative disorders as "a disruption and/or discontinuity in the normal integration of different domains like consciousness, memory, identity, emotion, perception, body representation, motor control, and behaviour" [6] Both ICD 10 and DSM 5 recognize the fact that dissociative disorders have physical as well as psychological symptoms. DSM 5 diagnoses conversion disorder as a part of somatic symptom disorders whereas ICD 10 includes it in dissociative disorders. We have followed ICD 10 in the current guidelines The following are the dissociative disorders as per ICD 10 (Table 1). [6]

Dissociative amnesia
Dissociative fugue
Dissociative stupor
Trance and possession disorders
Dissociative motor disorders
Dissociative convulsions
Dissociative anaesthesia and sensory loss
Mixed dissociative disorders
Other dissociative disorders
Dissociative disorder, unspecified

The Table 2 enlists the common types of dissociative disorders which are seen in the emergency department (ED).

Table 2: Common presentations of dissociative disorders in emergency department

Conversion disorder presenting as motor or sensory symptoms
Dissociative convulsions
Hyperventilation
Dissociative amnesia
Dissociative fugue
acute stress reaction
Possession states
Grief reaction presenting as dissociative symptom

Concurrent psychiatric and physical illnesses are common in dissociative disorders. In the study by V. Senthil Kumar Reddi [4] depressive disorder was seen in 11.2% patients, adjustment disorder was seen in 3.1%, Cluster B were found in 9% and Cluster C traits in 2.7% patients. Risk of suicide was noted in 8% patients. Epilepsy is known to occur with dissociative convulsions. A careful physical examination, a thorough mental state examination, investigations to differentiate between medical illnesses and dissociative disorders are essential while managing dissociative disorders in emergency setting.

ASSESSMENT

The outline for the assessment of dissociative disorders in the ED has been displayed in the following flowchart (Figure 1):

Figure 1: Outline for the assessment of dissociative disorders presenting as psychiatric emergencies
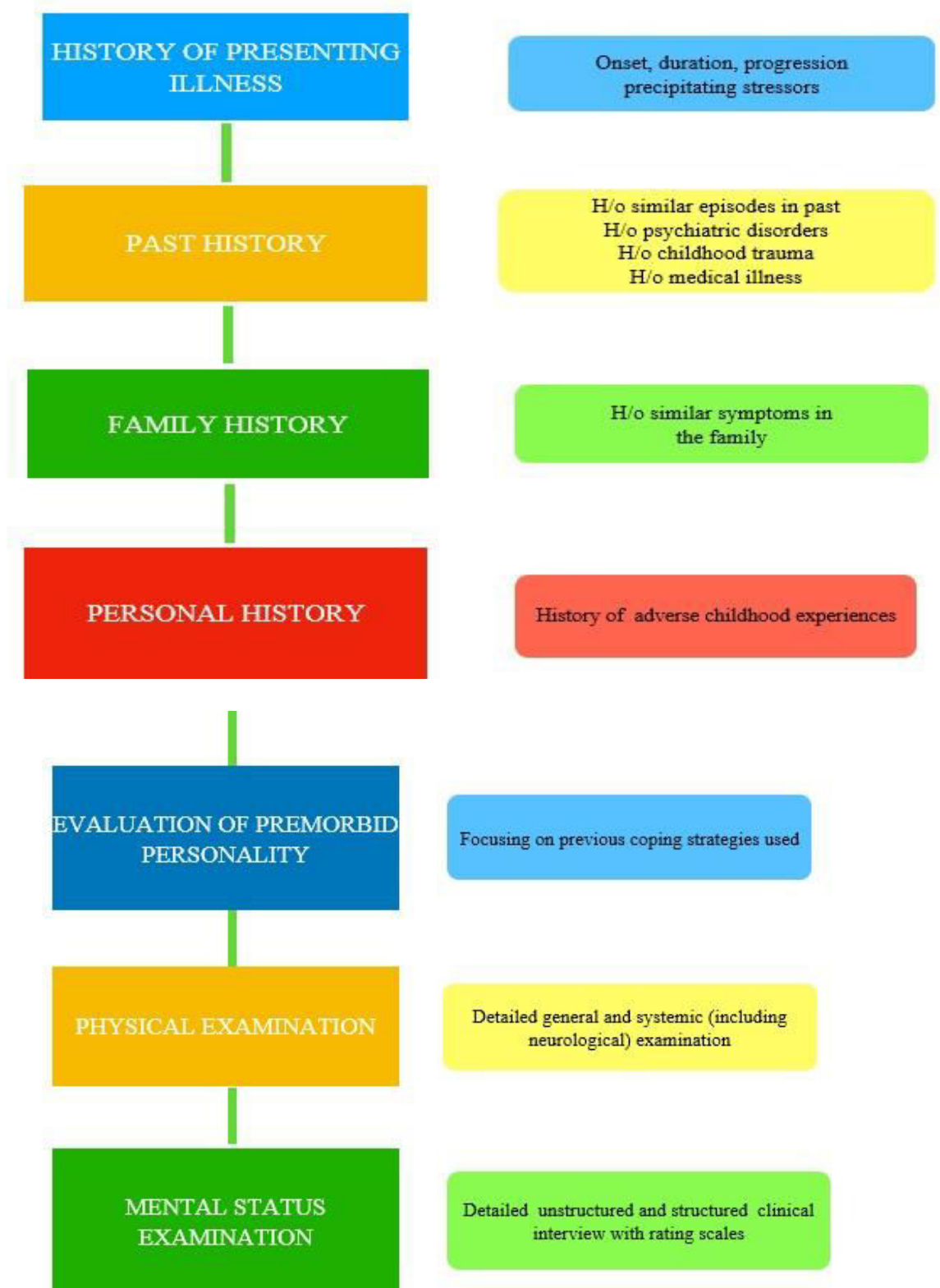
Studies have shown that among all psychiatric referrals in emergency settings, a call for the assessment of suspected dissociative disorder is most common [7] The tendency of dissociative disorders to emulate physical disorders makes assessment especially tricky. A wide range of medical conditions could mimic symptoms of dissociative disorders, medical conditions may produce &/or exacerbate psychiatric symptoms in patients already suffering from a mental illness, patients with pre-existing medical conditions can develop psychiatric symptoms and occasionally medical conditions and dissociative disorders can arise together. Failure to detect and diagnose underlying medical disorders may result in significant and unnecessary morbidity and mortality.[8]

On the other hand, many other psychiatric disorders can either present like or be present along dissociative disorders. The differential diagnosis that needs to be considered are enumerated in the table 3 below [9]

Table 3: Differential diagnosis of a presentation of an acute dissociative episode

Non-Psychiatric differentials	Psychiatric differentials
- Epilepsy - Transient Global Amnesia - Post encephalitic amnesia - Korsakoff amnestic syndrome - Post traumatic amnesia due to brain injury - Stoke - Multiple sclerosis - Systemic lupus erythematosus - Movement disorders - Myasthenia gravis - Poliomyelitis - Periodic paralysis - Other Neurocognitive disorders - Malingering	- Post Traumatic Stress disorder - Acute stress disorder - Psychotic disorders - Substance related amnesia - Depressive disorders - Anxiety disorders - Dementia - Delirium - Somatoform disorder - Factitious disorders

The medical knowledge and skills a psychiatrist possesses is extremely valuable in an emergency situation, this is especially true for the evaluation of dissociative disorders. The assessment of suspected dissociative disorders in the ED can be guided by the following questions (Table 4):

Table 4: Guiding questions for the assessment of dissociative disorders

Guiding questions for the assessment of dissociative disorders
• Does the clinical presentation suggest a differential of Dissociative disorders? • What is the specific type of dissociation disorder? • Could a physical disorder explain the set of symptoms? • Could a psychiatric disorder explain the set of symptoms? • Are there any associated psychiatric co-morbidities?

History taking

The importance of a detailed questioning about the current and past episode from the patient and an informant and a comprehensive medical, family, personal and premorbid history cannot be over emphasized. Yet focus on certain specific pointers can act as clues towards making an accurate diagnosis for the patient. These have been discussed below.

Onset, Duration and Progression

The general age of onset of dissociative disorders is believed to be late adolescence to early adulthood, dissociative identity disorder (DID) is an exception where the symptoms begin in early childhood. An equal number of males and females experience dissociative identity disorder however more females experiencing dissociative amnesia and dissociative movement disorders.[6] Various studies report the onset and termination of dissociative states as being sudden, the duration of each episode generally last for a few weeks or months, at times more chronic states, particularly paralyses and anaesthesia's, may occur if they are associated with insolvable problems or interpersonal difficulties.[5]

Precipitating stressors

Dissociative disorders are closely associated in time with traumatic events, insoluble and intolerable problems, or disturbed relationships. As per ICD 10 dissociation disorders can only be diagnosed if there is evidence for clear association between the occurrence of a stressful event and the onset of dissociation symptoms even if the association is denied by the individual.[5] Dissociative amnesia is known to occur after traumatic events like war, abuse, rape, accidents, head injuries, natural disasters, death of loved ones. [10]

History of Childhood Trauma

Among all psychiatric conditions, dissociative disorders are associated with the highest frequencies of adverse childhood experiences and hence a history of early age trauma could be an indicator towards making a diagnosis. According to a meta-analysis of 34 retrospective studies childhood maltreatment in the form of emotional neglect, sexual abuse and physical abuse are more common in patients suffering from dissociative disorders of movement and sensation then the controls.[11] Studies have consistently shown an association of DID with childhood abusive experiences typically by an attachment figure.[12] Dissociative amnesia is caused by several factors, one of which is traumatic events. These include war, abuse, rape, accidents, head injuries, and natural disasters. Dissociative amnesia is also caused by life stressors, such as abandonment, financial worries, death of a loved one, or marriage [10]

Characteristic Clinical Presentations of dissociative disorders in emergency settings

Dissociative Amnesia

Dissociative amnesia is seen very infrequently in our emergency settings. In the study conducted by V. Senthil Kumar Reddi [4] out of 187 patients of dissociative disorder patients seen in the emergency and acute services only one patient had dissociative amnesia. Dissociative amnesia is characterized by memory loss where a person is unable to recall important information in personal life. This is usually associated with severe trauma, severe

emotional stress and internal conflict. Usually there is a history of preceding traumatic event. This memory loss cannot be explained by ordinary forgetfulness. It is not due to substance use or a medical condition (Table 5).[5]

Table 5: Types of dissociative amnesia according to DSM 5[6]:

Localized amnesia
Loss of memory related to events during a specific period
Selective amnesia
Loss of memory related to some events but not all occurring during a circumscribed period of time
Generalized amnesia
Loss of memory about one's entire life
Continuous amnesia
Loss of memory of events one after another sequentially
Systematized amnesia
Loss of Memory of certain specific events such as all memories relating to one's family or a particular person

---

Patients present in the casualty with various features including physical symptoms, regression to younger age, depersonalization, derealization, perplexed affect, attention seeking behavior, trance states. Patients may have depression and risk of suicide. There is often history of trauma in childhood or in the past. Dissociative amnesia is often seen in combat related trauma. These patients are usually young adults, and it is rarely seen in elderly individuals. Family history of somatoform disorders and dissociative disorders is seen in some patients. [5,13]

Dissociative Fugue

It has all the features of dissociative amnesia, along a journey away from home or place of work. This journey characteristically appears purposeful, and the persons self-care is maintained throughout. In some cases, during the period of travel a new identity may be assumed with a surprising degree of completeness and the individual's behaviour during this time may appear completely normal to independent observers. Organized travel may be to places previously known and of emotional significance.[5]

Dissociative Motor Disorders

Dissociative motor disorder includes loss of ability to move one or more than one limb, incoordination &/ or trembling or shaking of one or more extremities or the whole body. Paralysis may be partial (presenting with weak or slow movements) or complete. Some dissociative motor disorders may be hard to differentiate from various forms of ataxia, apraxia, akinesia, aphonia, dysarthria, dyskinesia, or paralysis.[5]

Dissociative anaesthesia and sensory loss

Cases of dissociative anaesthesia and sensory loss generally present to the ED with complaints of sudden hemisensory loss or as sensory loss not conforming to known neuroanatomical distributions, eg: anteriorly at the level of the trunk, without similar posterior involvement. Sensory complaints can be isolated or accompanied by motor weakness and are frequently associated with complaints of paraesthesia.

Cases, commonly in children and adolescent age group can also present to the ED with dissociative visual loss (usually in the form of loss of visual acuity, blurring or visual field restriction such as tunnel vision) and hearing loss.[14]

Dissociative convulsions

Dissociative convulsions are characterized by episodes similar to seizure episodes, but do not have any seizure activity on video EEG. These episodes are characterized by various symptoms including motor, sensory, autonomic and/or cognitive signs.[15] Dissociative convulsions is one of the commonest presentations in emergency settings in India.[4] Dissociative convulsions are not under the patient's voluntary control and represent their involuntary response to emotional stress. Noteworthy points in clinical history include specific emotional triggers such as emotional arousal, pain, patterns like head-shaking or irregular, asynchronous limb movements, noises, and light.[16]

Trance and possessions

Most cases of trance and possession disorder (commonly referred to as dissociative trance disorder or DTD) present with attacks of possession by culturally known local entities such as deities, the devil, malevolent spirits, deceased relatives or ancestors and animals. Very frequently, the episodes are associated with visual/ auditory hallucinations, fearfulness, and paranoia, making them difficult to differentiate from acute psychotic disorders. The transient alteration in consciousness as a part of DTD can also be associated with self-mutilating behaviours including suicide attempts. Although possessed entities frequently threaten the accompanying family members with violence, physical acts of aggression towards others have been documented less commonly, including ritualistic homicide in rare cases.[17]

Table 6 enlists the differentiating clinical features of the types of dissociative disorders [5]

Table 6: Differentiating clinical features between various types of dissociative disorders

Dissociative amnesia	Dissociative Fugue	Dissociative Motor disorders	Dissociative anaesthesia Sensory loss	Dissociative stupor	Dissociative convulsions	Trans and possession
Inability to recall recent events, Usually that of personal importance	An apparently purposeful journey away from home or work place along with loss of memory of the event	A complete or partial loss of ability to move one or more than one limb	A complete or partial Sensory loss in one or more modality	A decrease or absence of voluntary movement and responsiveness to external stimuli.	Movements that resemble epileptic seizures	A partial or complete loss of sense of awareness of ones surroundings along with loss of ones identity.

Clinical features differentiating other psychiatric disorders

Not so infrequently, other psychiatric disorders can themselves present with dissociative symptoms such as dissociative convulsions, depersonalization/ derealization episodes. Dissociative symptoms can be observed in PTSD, psychotic disorders, mood disorders and neuro cognitive disorders. Some points which can help differentiate dissociative disorder from other psychiatric disorders are mentioned in the table below in Table 7 [15]

Table 7: Differentiating dissociative disorder from other psychiatric disorders

Forgetfulness	Unrelated to trauma or stress, memory loss less extensive
Delirium	Disturbances in sensorium, disorientation, perceptual disturbances, medical etiology.
Dementia	Many cognitive domains affected. Autobiographical memory affected late in the course. Psychobehavioral symptoms present
Substance use disorder	History of substance use present, amnesia and/or travel is associated with time of abuse of the substance.
Acute stress disorder and PTSD	May coexist with dissociative amnesia. Other features of ASD and PTSD are seen.
Schizophrenia	Memory loss may occur during acute episode, However, delusions and hallucinations and usually present. Wandering and travel may also occur. Often the person calls attention to himself or her self-owing to the inappropriate behaviour.
Somatoform disorders	Can present with sensory motor symptoms similar to dissociative disorders, however the former is a chronic illness that begins early in life and includes symptoms in many other organ systems

Clinical Features differentiating from intentional production of symptoms

Considering the absence of organic aetiopathogenesis and its associated investigative markers is a feature of dissociation, factitious and malingering, differentiating between the three can be challenging and relies on history taking and clinical features. According to model of compensation neurosis, conversion disorders, factious disorders and malingering lie on a spectrum where the latter two is said to be intentionally produced whereas the former is not. In factitious disorder deceptive behaviour has an internal motivation and evident even in the

absence of external rewards whereas malingering is motivated by external incentives, such as an attempt to avoiding working, obtain financial benefits, evading criminal charges, or procuring drugs. Detailed past history often identifies the signs of simulation in childhood and adolescence.Careful examination of previous medical records shows an unusual large number of childhood illnesses along with signs of psychiatric disorders like substance abuse, mood and personality disorder. Another sign is the patient resisting the access to information for other sources. [18]

Clinical features to differentiate from medical disorders

Ruling out medical disorders based on history is challenging however certain questions could indicate an organic pathology. Epilepsy is an important differential of dissociative disorders, clinical features differentiating dissociative convulsions and epilepsy is as mentioned below in table 8. [19]

Table 8: Differentiating between epileptic seizures and dissociative convulsions.

Favouring epilepsy	Favouring dissociative convulsions
Pre-ictal Unrelated to stressful events Sleep: Occurs in physiological sleep Occur even when alone Frequently preceded by presence of aura	Precipitated by stressful events Usually occur while awake Mostly around people Not preceded by aura
Ictal Gradual occurrence Duration: <2 minutes, generally fixed Patients speech is incoherent and consist of monotonous, meaningless phrases or sounds(Epileptic cry)	Sudden occurrence >2 minutes, frequently variable. Patients speech is coherent and the tone usually sad

Head rotation movements: Absent	Present
Pupils are dilated with altered reaction time	Pupils appear normal
Consistent increase heart rate	Inconsistent increase in heart rate
Urinary incontinence commonly occurs	Urinary incontinence is extremely rare
Tongue bites usually on the lateral side	Tongue bite usually on tip of the tongue
Eyes mostly open	Eyes closed usually
Focal neurological deficits can occur	Focal neurological deficits does not occur
Fractures or ecchymoses due to fall are seen	Rug burns or excoriations due to vigours movement more common
Post Ictal Recovery is gradual with postictal amnesia and headache common	Recovery is suddenly with postictal amnesia and headache not seen.

Amnesia can also follow an episode of seizure. Complex partial seizures may occur along with automatisms. Transient global amnesia is seen in older individuals, cerebrovascular risk factors is present along with sudden onset of anterograde amnesia, loss of new learning capacity, autobiographical memory intact, insight into memory loss present and there is complete recovery [13].

Clinical Interview

Interview of the patient can be done in an unstructured manner in the form of asking questions pertaining to the symptoms of dissociative disorders, some of the questions are outlined in the table 9 below. It can also be done in a structured manner in the form of scales

(Table 10). It is important to note that along with these questions the importance of a comprehensive mental status examination should not be deemphasized.[15]

Table 9: Important interview questions to elicit dissociative symptoms

INTERVIEW QUESTIONS
• Do you ever experience blackouts, blank spells, memory lapses? • Have you found yourself to have lost time which you cant explain ? • Do people tell you about the behaviour you exhibited which you are unable to remember? • Do you ever find yourself far away from your home or workplace and not know how you got there? • Do you find objects in your possession that you do not remember ever having? • Do you find that you objects are missing or not in their usual place? • Do you have thoughts or feelings that are not in your control or not yours ? Do they and come from inside or outside you?

Table 10: Various assessment tools available for screening dissociative disorders [15]:

Scales	Type	No of questions
Dissociative experience scale	Self report	28 items
Somatoform dissociation questionnaire	Self report	20 items
Somatoform dissociation questionnaire -5	Self report	5 items
Peritraumatic Dissociative Experiences Questionnaire (PDEQ)	Self report	10 items
Cambridge Depersonalization Scale (CDS)	Self report	29 items
Clinician-Administered Dissociative States Scale	Clinician administered	28 items
Multidimensional Inventory of Dissociation	Self report	218 items

Clinical examination

A thorough head-to-toe examination is as important as a good clinical history while evaluating a suspected case of dissociative disorder in the ED. The examination should focus on ruling out primary medical causes enlisted above as well as gathering information in support of a dissociative aetiology.

The bedside neurological exam is the core element used to make a diagnosis of dissociative disorders specially those of Dissociative motor and/or sensory symptoms. Examination findings can often be subtle and warrant practice to avoid misdiagnosis; thus, the specificity of signs may be reduced in individuals showing "marginally" positive signs or when performed by clinicians who have more limited expertise. A systematic and narrative review by Daum et all [20] evaluated many signs for functional neurological symptoms, they found that 14 have been validated, these tend to have low sensitivity but a high specificity value which suggest that even though they are not always present in patients with functional symptoms, when positive they help in to "RULE IN" dissociative disorders. These along with their descriptions are mentioned in the table 11.

Table 11: Clinical signs during neurological examination to 'rule in' dissociative disorders

Functional disorder	Test	Description
Motor symptoms	Hoover sign	After the patient lies in a supine position, the examiner puts his hand under the heel of the non-paralysed leg and instructs the patient to try lifting the paralysed leg. Sign (-)ve if downwards pressure is exerted by the non paralysed leg on the examiners hand Sign (+)ve no pressure is exerted by the non paralysed leg on the examiners hand. Sign (+)ve indicated a dissociative cause
	Abductor sign	After the patient lies in a supine position, the examiner puts both hands on lateral side of the patients legs and puts adducting pressure equally with both hands.The patient is told to abduct the non paralysed leg while the examiner observes the movement of the paralysed leg. Sign is (-)ve if the paralysed leg moves towards

		the midline Sign is (+)ve if the paralysed leg stays in the Same position Sign (+)vs indicates dissociative etiology
	Abductor finger sign	The patient sits on a chair with resting both forearms on board and suspending hands in air. The patient is instructed to abduct the fingers of the non paralytic hand for 2 mins against the resistance provided by the examiners hand. Sign (-) ve if the paralytic hand remains in same position Sign (+) vs if the paralytic hand also abducts due to synergy. Sign (+)ve indicates dissociative etiology
	Spinal injury test	After the patient lies in supine position, the examiner lifts patients knees on the bed and then releases the knees gently Sign (-)ve if the legs become straight Sign (+)ve if the knees remain lifted Sign (+)vs indicates dissociative etiology
	Collapsing/give-away weakness	In Dissociative motor disorders the limb initially provides resistance on light touch but then suddenly gives away and collapses.
	Co-contraction	Observation during muscle strength testing (or with surface electromyogram) Sign+if simultaneous contraction of agonist and antagonist resulting in no/little movement
	Motor inconsistency	In dissociative disorders some moments of a muscle group are possible where as other movements of the same muscle group are impaired
Sensory Symptoms	Midline splitting	Dissociative cause is more likely if there is exact splitting of sensation in the midline
	Splitting of vibration	Dissociative disorder is more likely if a difference is found in the sensation of a tuning fork placed over the left compared to the right side of the sternum or frontal bone
	Non anatomical sensory loss	Dissociative disorder is more likely if the Diminished sensation fit a 'non-dermatomal pattern' distribution
	Inconsistency/Changing pattern of sensory loss	In dissociative disorders the sensory loss in generally inconsistent and non reproducible on repeated sensory testing
Gait symptoms	Dragging monoplegic gait	In dissociative disorders during walking the paralysed leg instead of performing a circumduction is dragged at the hip behind the body.
	Chair test	If the Patient is able to propel a swivel chair better than walking then a dissociative cause is more likely .

Investigations

Since a large number of medical disorders can present with dissociative symptoms, the investigations that can be done on an emergency basis are limited, they are alluded upon in the table 12 presented below [15]

Table 12: Advisable investigations in emergency settings while evaluating dissociative disorders

---

- EEG- to rule out seizure disorders
- CT scan head/ MRI Brain-to rule out structural lesions of the brain
- Drug urine screening to rule out substance use disorder
- Serum prolactin to rule out seizure disorder
- Complete blood count, Blood sugar levels, Serum electrolytes to rule out physical disorders

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MANAGEMENT

Generally, the main goal of treatment in dissociative/ conversion disorders is improvement in the patient's adaptive functioning via psychotherapy techniques focusing on the stressors rather than the dissociative episodes. However, an acute dissociative episode, especially in those with a hitherto undiagnosed illness, can be an extremely harrowing experience for the patient as well as their family members. Apart from this, certain cases can also present with considerable risk of harm to self or others. Hence, in the emergency settings, the most important goals for management are safety and symptom reduction. Table 13 outlines the key principles to be remembered for the same:

Table 13: Key principles of management of psychiatric emergencies in dissociative disorders

Key principles of management of psychiatric emergencies in dissociative disorders
• Ensure safety of the patient, the bystanders as well as your own
• Avoid confronting patient in the ED with the opinion that the symptom is of psychological origin as this is likely to hinder with the formation of therapeutic alliance.
• Judicious but thorough investigative work up and referral to rule out a primary medical

cause of presenting symptoms.

- Avoid unnecessary evaluation of symptoms as it can lead to fixation on symptoms and hinder treatment

- Remember that diagnosis of dissociative/ conversion disorder is not based on negative medical workup since both can co-exist not so infrequently.

The flowchart for management of dissociative disorders presenting in the ED have been summarized in Figure 2.

Figure 2: Outline of management of acute dissociative episode presenting in emergency settings

```
┌─────────────────────────────────────┐
│ Patient presenting with suspected    │
│ dissociative/ conversion symptoms    │
│ in the ED                            │
└─────────────────────────────────────┘
```

Assessments:	Management of acute episode:
Neurological evaluation Ophthalmological/ENT evaluation Psychosocial evaluation Investigations	Establishing safety Establishing therapeutic alliance Relaxation techniques Grounding techniques Talking through Pharmacological treatment options Psychoeducation

```
                    ┌─────────────────────────────────┐
                    │ Is dissociative/ conversion disorder │
                    │ confirmed at the ED?            │
                    └─────────────────────────────────┘
            ┌─────────────────┴─────────────────────────┐
            ▼                                            │
       ┌────────┐                                   ┌────────┐
       │  Yes   │                                   │   No   │
       └────────┘                                   └────────┘
            │                                            │
            ▼                                            ▼
                                         ┌─────────────────────────────────┐
                                         │ Is dissociative/ conversion disorder │
                                         │ still suspected?                │
                                         └─────────────────────────────────┘
```

| Plan further line of management: | | Is dissociative/ conversion disorder still suspected? |

```
┌──────────────────────────────┐        ┌────────┐         ┌────────┐
│ Plan further line of         │        │  Yes   │         │   No   │
│ management:                  │        └────────┘         └────────┘
│                              │             │                  │
│ Deciding the treatment       │             ▼                  ▼
│ setting (OPD vs IPD) for     │   ┌──────────────────────┐  ┌──────────────────┐
│ Evaluating psychosocial      │   │ Deciding further     │  │ Appropriate      │
│ stressors                    │   │ management setting:  │  │ referral for     │
│ Treating psychiatric         │   │ OPD vs IPD           │  │ further diagnostic│
│ comorbidities                │   │ Further medical and  │  │ evaluation and   │
│ Planning psychotherapy       │   │ psychiatric assessments│ │ management       │
└──────────────────────────────┘   │ Planning psychotherapy│  └──────────────────┘
                                    └──────────────────────┘
```

<u>Establishing safety</u>

The foremost task when a dissociative disorder presents acutely to the ED is to establish safety of the patient and/ or surrounding people, followed by symptom reduction [21]. Table 14 covers the points to be ensured for the same.

Table 14: Important points while establishing safety in an acute presentation of dissociative disorder

Establishing safety during an acute presentation of dissociative disorder in the ED
Always remain calm and reassuring.
Isolate the patient, preferably in a separate quiet room.

> Ask the family members and/ or the bystanders to leave the room unless their presence is specifically warranted.
>
> Ensure that the environment is free of sharps or any potentially harmful substances
>
> Monitor airway, breathing and circulation (in case of an acute PNES attack).
>
> Avoid administering noxious stimuli (such as ether inhalation or sternal pressure) in case of a stuporous/ unresponsive patient.
>
> In case of marked excitation/ agitation with risk of harm to self/ others, use verbal de-escalation techniques to calm down the patient. However, keep nursing staff on standby for physical/ chemical restraining in case verbal de-escalation fails.
>
> Always ensure your own safety as well as that of others.
>
> Stay with the patient till the symptoms begin to improve.

Establishing therapeutic alliance

Establishment of a good rapport and therapeutic alliance with both the patient and family members is fundamental for successful treatment. This makes it easier for the family members to understand the doctor's point of view, particularly in cases where their behaviours and interaction with the patient have a contributory role in the disorder. Similarly, a compassionate understanding the patients' and their caregivers' perception of the symptoms is also important.

Employing relaxation techniques

In patients that present with acute conversion symptoms such as hyperventilation or a PNES attack, relaxation techniques targeting the anxiety such as slow, deep breathing can help in reducing the intensity of the attack and thereby help in early termination. Calm and precise instructions along with verbal suggestions to the patient go a long way over medications in causing reduction of the symptoms.

Using Grounding techniques

Patients with dissociative disorders and a history of trauma often experience acute dissociative episodes characterized by a subjective feeling of emotional numbing, depersonalization, and flashbacks of the traumatic past secondary to ongoing stress or anxiety. Sometimes, a patient may present to the ED in such a state, even if the present situation no longer poses any kind of danger.

Grounding techniques are designed to connect the patient back to the reality and the present moment, thereby reducing the intensity of the dissociative (trance, depersonalization etc) episode. With practice, it also helps in preventing such spontaneous episodes, including the switches in DID. The techniques employ simple instructions to improve the patient's sensory awareness (awareness of the body's position using any of the five senses) or cognitive awareness (awareness of themselves and the place/ people around them) of the present moment.[22] The details are mentioned in Table 15.

Table 15: Important grounding techniques which can be used in emergency settings

Grounding techniques which can be used in the ED
Improving sensory awareness: Asking the patient to focus on the sound of a clock or the doctor's voice (auditory)   Asking the patient to identify 10 colours in the room (visual)   Making the patient hold an easily accessible palm-sized object in their hand (touch)   Improving cognitive awareness: Orienting the patient to name, age, day, date, and location

Talking through

At times when dissociative trance/ possession disorders are in an acute spell or patients with multiple personality (dissociative identity) disorder present switch, they can present to the ED in a state of acute excitement/ agitation. In such cases, instead of resorting to the more aggressive methods of physical or chemical restraining, it is possible to tide through the acute situation merely by compassionate listening and talking directly to the possessing entity/ personality system. This involves acknowledging the personality system, directly addressing the internal conflict, and emphasizing on the need of working together to ensure good adaptive functioning. Similarly in case of the possession spell, a balance of modern techniques and culture-specific traditional approaches frequently may be required. This

involves acknowledging the 'entity,' listening to its needs and then persuading it to leave the body. For this, a non-judgemental acceptance of the patient's/ caregiver's perception of the symptoms is paramount.

<u>Pharmacological management</u>

Due to varied clinical presentations frequently overlapping with medical conditions and a tendency of patients/caregivers to resort to more traditional methods of treatment (eg. Faith healers, shamans), very few studies have been able to systematically investigate the pharmacological management of dissociative disorders in an acute setting. Apart from this, no psychotropic medications have been specifically recommended or have been found to be useful for management of dissociative disorders, unless there is a presence of comorbid psychiatric condition such as depression or anxiety disorder.

For management of dissociative disorders in emergency settings, benzodiazepines and antipsychotics have been the most used psychotropic agents based on data available from case series and open-label studies [23]

For treatment of acute anxiety associated with a dissociative/ conversion episode, benzodiazepines (BZDs) such as lorazepam (2mg) and clonazepam (0.5mg) can be administered per orally (PO). In cases where immediate action is warranted, as in case of acute agitation, lorazepam 2mg can be administered IM or IV, with repeat dosing in 30 minutes if required.

In cases of severe psychotic agitation/ excitement, particularly when the distinction between a primary psychotic disorder and dissociative disorder may be unclear, IM Haloperidol up to a dose of 5mg can be administered along with Promethazine 25mg can be administered. If required, the dose may be repeated after 1-2 hours.

Coadministration of IM Haloperidol 5mg with lorazepam 2mg may have additive calming effect, but with a higher chance of sedation.

Unless the diagnosis of PNES is unclear, empirical antiepileptics are not recommended after an acute non-epileptic seizure attack.

Importantly, it must be noted that excessive reliance on PO benzodiazepine preparations (such as sublingual formulations) for managing every acute episode can promote secondary gain in the patient. Similarly, in cases of patients with established/ clear diagnosis of

dissociative disorders who come to emergency services in an acute attack, the family members should be tactfully explained that medications are neither required nor approved for dissociative symptoms. Otherwise, the caregivers may perceive that the doctor is unable to diagnose/ treat the presenting illness. Moreover, unnecessary reliance on medications may lead to the patient/ family members losing their focus from the non-pharmacological modalities of treatment due to the belief that the medications will cure the dissociative/ conversion symptoms.

However, in some cases, administration of placebo with verbal suggestions may also be required to ensure proper follow-up of the patient and caregivers for further sessions, particularly in those with poor psychological awareness, poor support system and in those insisting on medications.

Psychoeducation

Psychoeducation of family members forms a crucial part of the management even in acute settings. Efficient communication about the nature of the disorder and its symptoms and the role of in establishing trust and ensuring follow-up for treatment. Key points have been mentioned in Table 16. [24]

Table 16: Key points to be conveyed to the caregivers during psychoeducation regarding dissociative disorders

Key points to be conveyed during psychoeducation
• Acknowledging and reinforcing the genuineness of the presenting symptoms.
• Explaining that the presence of symptoms in the absence of a physical illness is common.
• Using metaphors to describe functional/ psychological nature of symptoms eg: similar to a "software rather than a hardware problem" and that the symptoms occur when the "computer crashes" can be helpful in conveying the nature of the illness.
• Explaining the relationship between the mind and body and how stress and emotions can lead to physical manifestations eg: physical manifestations of anxiety

- Reassuring that the symptoms are not dangerous or life-threatening (except in cases involving self-harm or harm to others)
- Instructing family members to avoid promoting secondary gain during an acute episode
- Highlighting the importance of psychological treatment focusing on stressors in reducing the frequency/intensity of dissociative symptoms, managing stress, and improving the adaptive functioning of the patient. Conveying the role of medical treatment as only for comorbid depression or anxiety.
- Promoting a hopeful sentiment of improvement with proper treatment using available approaches

Determination of further management plan

Once the acute symptoms have subsided in the ED, a plan for further management can then be formulated. For detailed evaluation, planning further psychotherapeutic approaches and managing interpersonal conflicts, the choice of treatment setting between OPD and indoor management has to be decided upon. Hospitalization is recommended in certain situations as mentioned in Table 17. [25]. Otherwise, the patient can be asked to follow up on an OPD basis for further treatment.

Table 17: Indications for hospitalization in dissociative disorder presenting as a psychiatric emergency

Indications for indoor treatment of dissociative disorder presenting as a psychiatric emergency
Unclear diagnosis (possibility of underlying primary medical cause for symptoms or clarification of complex psychopathology)
Risk of harm to self (self-mutilation or persistent suicidal ideations) or others
Presence of overwhelming dissociative/ conversion symptoms causing significant disability
Severe perceived disability by the family members
Presence of medical co-morbidities requiring intensive monitoring and treatment
Progressive worsening of clinical picture due to poor adherence to treatment or recent crisis in patient's life

CONCLUSION

This CPG explores the variety of ways in which dissociative disorders can present in an emergency setting and provides approaches towards their diagnosis and acute management. There may be a significant overlap between the presentation of dissociative disorders and medical illnesses (especially neurological) in emergency settings. A detailed history exploring the semiology of the episodes, temporal relation with stressful events, comorbid psychiatric illnesses and a thorough clinical examination are important to differentiate the same. In many cases, certain investigations maybe required before reaching a clear diagnosis. Due to the presence of co-morbid psychiatric illnesses and the associated psychosocial stressors, a holistic management plan that includes psychotropics as well as psychosocial interventions may be required.

REFERENCES

1. Naskar S, Nath K, Victor R, Saxena K. Utilization of emergency psychiatry service in a tertiary care centre in north eastern India: A retrospective study. Indian Journal of Psychological Medicine. 2019 Mar;41(2):167-72.

2. Chaturvedi SK, Desai G, Shaligram D. Dissociative disorders in a psychiatric institute in India-a selected review and patterns over a decade. International Journal of Social Psychiatry. 2010 Sep;56(5):533-9.

3. Grover S, Dua D, Sahoo S, Chakrabarti S. Profile of patients seen in the emergency setting: A retrospective study involving data of 5563 patients. Journal of Mental Health and Human Behaviour. 2021 Jan 1;26(1):40.

4. Reddi VS, Salian HH, Muliyala KP, Chandra PS. Profile and outcome of dissociative disorders presenting as psychiatric emergencies to a tertiary hospital setting in India. Asian journal of psychiatry. 2019 Aug;44:187-8.

5. World Health Organization(WHO). *The ICD-10 Classification of Mental and Behavioural Disorders*. World Health Organization, 1993:151-161

6. Diagnostic and Statistical Manual of Mental Disorders: DSM-5. 5th ed., American Psychiatric Association, 2013: 291-307

7. Ranjan S, Poudel R, Pandey P. Pattern of psychiatric referral from emergency department of a tertiary level hospital in Nepal. Journal of Universal College of Medical Sciences. 2015;3(2):5-9.

8. Lagomasino I, Daly R, Stoudemire A. Medical assessment of patients presenting with psychiatric symptoms in the emergency setting. Psychiatric Clinics of North America. 1999 Dec 1;22(4):819-50.

9. Sivec HJ, Lynn SJ. Dissociative and neuropsychological symptoms: The question of differential diagnosis. Clinical Psychology Review. 1995 Jan 1;15(4):297-316.

10. Fouche P, Pieterse MC, Geyer MT. Dissociative Amnesia related to Trauma: A Systematic Review.

11. Ludwig L, Pasman JA, Nicholson T, Aybek S, David AS, Tuck S, Kanaan RA, Roelofs K, Carson A, Stone J. Stressful life events and maltreatment in conversion (functional neurological) disorder: systematic review and meta-analysis of case-control studies. The Lancet Psychiatry. 2018 Apr 1;5(4):307-20.

12. Şar V. Childhood trauma and dissociative disorders. In Childhood Trauma in Mental Disorders 2020 (pp. 333-365). Springer, Cham.

13. Sadock, Benjamin J., Harold I. Kaplan, and Virginia A. Sadock. *Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/clinical Psychiatry*. 10th ed. Philadelphia: Wolter Kluwer/Lippincott Williams & Wilkins, 2007

14. Anderson JR, Nakhate V, Stephen CD, Perez DL. Functional (psychogenic) neurological disorders: assessment and acute management in the emergency department. InSeminars in Neurology 2019 Feb (Vol. 39, No. 01, pp. 102-114). Thieme Medical Publishers.

15. Sadock, Benjamin J., et al. Kaplan and Sadock's Comprehensive Textbook of Psychiatry. 10th ed., Wolters Kluwer, 2017.

16. Fritzsche K, Baumann K, Götz-Trabert K, Schulze-Bonhage A. Dissociative seizures: a challenge for neurologists and psychotherapists. Deutsches Ärzteblatt International. 2013 Apr;110(15):263.

17. During EH, Elahi FM, Taieb O, Moro MR, Baubet T. A critical review of dissociative trance and possession disorders: etiological, diagnostic, therapeutic, and nosological issues. The Canadian Journal of Psychiatry. 2011 Apr;56(4):235-42.

18. Bass C, Halligan P. Factitious disorders and malingering: challenges for clinical assessment and management. The Lancet. 2014 Apr 19;383(9926):1422-32.

19. Kedare JS, Baliga SP. Management of Psychiatric Disorders in Patients of Epilepsy. Indian Journal of Psychiatry. 2022 Mar;64(Suppl 2):S319.

20. Daum C, Hubschmid M, Aybek S. The value of 'positive'clinical signs for weakness, sensory and gait disorders in conversion disorder: a systematic and narrative review. Journal of Neurology, Neurosurgery & Psychiatry. 2014 Feb 1;85(2):180-90.

21. Tilahun BB, Bautista JF. Psychogenic nonepileptic seizure: An empathetic, practical approach. Cleveland Clinic Journal of Medicine. 2022 May 2;89(5):252-9.

22. Turkus JA, Kahler JA. Therapeutic interventions in the treatment of dissociative disorders. Psychiatric Clinics. 2006 Mar 1;29(1):245-62.

23. Sutar R, Sahu S. Pharmacotherapy for dissociative disorders: A systematic review. Psychiatry Research. 2019 Nov 1;281:112529.

24. Agarwal V, Sitholey P, Srivastava C. Clinical practice guidelines for the management of dissociative disorders in children and adolescents. Indian Journal of Psychiatry. 2019 Jan;61(Suppl 2):247.

25. Subramanyam AA, Somaiya M, Shankar S, Nasirabadi M, Shah HR, Paul I, Ghildiyal R. Psychological interventions for dissociative disorders. Indian journal of psychiatry. 2020 Jan;62(Suppl 2):S280.

Clinical Practice Guidelines for assessment and management of patients with substance intoxication presenting to emergency

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Abstract

Intoxication is a transient disturbance of consciousness, cognition, perception, affect, behaviour, or psychophysiological functions following administration of a psychoactive substance in clinically significant amounts. Common substances of intoxication encountered in emergency setting in India are alcohol, cannabis, opioids and benzodiazepines. It is imperative that a healthcare provider working in emergency setting be well-versed in identification and management of intoxication with various substances. This chapter focusses on clinical considerations while managing intoxicated patients along with clinical features, assessment and management of intoxication with common psychoactive substances.

Introduction

The International Statistical Classification of Diseases and Related Health Problems, revision 10 (ICD-10) describes intoxication as *"a transient condition following the administration of alcohol or other psychoactive substance, resulting in disturbances in level of consciousness, cognition, perception, affect or behaviour, or other psychophysiological functions and responses."* [1]. Intoxication is generally an acute phenomenon, whose intensity and effects wear off with time, and disappear completely in the absence of further use of the substance.

While most episodes of intoxication do not need medical attention, sometimes intoxicated patients may present to the Emergency Department [1]. The reasons for seeking medical attention may either be due to the substance use itself, for example, extreme agitation or violent behaviour that may endanger the patient or others around him, or due to an adverse consequence of substance use, for example, head injury in a road traffic accident that occurred due to driving while intoxicated.

Common substances of intoxication encountered in emergency setting in India are alcohol, cannabis, opioids and benzodiazepines. Cases of intoxication with other substances like inhalants, stimulants, hallucinogens and newer psychoactive substances including synthetic cannabinoids and club drugs may also present to the Emergency Department. Often the substance of intoxication may be unknown or falsely reported due to fear of legal implications or there may be use of more than one intoxicating substance, complicating the clinical picture. Patients may present with decreased levels of consciousness, vomiting, seizures or other symptoms that may resemble other medical or surgical emergencies. It is, thus, imperative that healthcare professionals working in the Emergency Department be well-versed with identification, assessment and management of intoxicated patients presenting to them (2).

Caring for intoxicated patients in the Emergency Department comes with various other issues that require a clinician's time and effort. Frequently, these patients are brought into the

Emergency Department against their wishes, and refuse medical care. These patients may also be brought for medical attention by law enforcement authorities, with no available identification details, reliable history, or even in association with an alleged crime or illegal activity making it essential for the emergency care provider to be competent in dealing with the medicolegal aspects of intoxication, providing optimum medical services to the patient along with safeguarding the legal procedures. The present Clinical Practice Guidelines deal with the assessment and management of patients with substance intoxication presenting to the emergency. The guidelines present the general considerations while attending to a substance intoxicated patient, followed by general signs of intoxication. Thereafter, details of intoxication with specific substances are discussed, namely, alcohol, cannabis, opioids, benzodiazepines, and other substances. Features of intoxication, assessment and management are discussed for each of these substances. Multiple substance intoxication is also discussed in the guidelines. Special populations are referred to including children and adolescents, women and elderly population. The guidelines do not cover intoxication with nicotine and caffeine intoxication (unlikely to be encountered in clinical setting). Accidental and ingestion of substances with an intent foe self-harm is not catered to in these guidelines (Refer to Clinical Practice Guidelines for management of Suicidal Behaviour). We also do not go into details of intoxication presenting with additional psychiatric and/or medical illnesses and each such case is likely to be unique with own specific constraints and challenges of management (Refer to section on Dual Diagnosis: Psychotic disorders in Clinical Practice Guidelines on Newer and Emerging Addictive Disorders in India. Indian psychiatric society; 2016).

General considerations while attending to a substance intoxicated patient

Patients with intoxication with a substance of abuse present several challenges during assessment and management (as depicted in figure 1). One of the foremost concerns is the potential unreliability of history. Patients with substance intoxication may give inaccurate or unreliable history. This may be partly attributable due to patients trying to minimize their substance use, or not recollecting details adequately due to cognitive impact of the substance, or concealment of the details of substance use from the family, or avoiding sharing details to prevent legal implications. Thus, multiple sources of information can be resorted to get more comprehensive account of the patient's condition. Friends, family, and previous treatment records can be useful sources of collateral information about the patient. In some circumstances, physical examination and mental status examination of an uncooperative patient can be helpful to get a clearer clinical picture of the patient (for example, injection track marks can hint towards opioid overdose in an otherwise comatose patient).

Another challenge that comes across in patients with intoxication in the occurrence of agitation or violence. Some of the intoxications with substances, like alcohol and stimulants like cocaine, may be associated with aggression. Aggression may be due to disinhibition and impaired judgement associated with substance use (Refer to Clinical Practice Guidelines on Aggressive and assaultive behaviour). Furthermore, substance use disorder may be associated with other psychiatric or medical illnesses, which may individually contribute to the occurrence of agitation or aggression. Addressing aggression promptly is required to prevent harm to self and others. Other relevant guidelines of the Indian Psychiatric Society may be referred to, while addressing aggression and violence when patients with substance intoxication present to the emergency setting.

A related issue is the consumption of substances or presentation with substance intoxication with the intent to kill self. This may be a presenting feature in patients with overdose of

opioids or sedative-hypnotics. Sometimes, patients may also consume large amounts of alcohol when they have an intent to die. Thus, self-harm should be considered as a possibility when patients present with substance intoxication, and suitable assessment measures should ascertain risk to self and the presence of concurrent psychiatric disorder. If required, additional treatment should be instituted for the patient.

A relevant aspect of consideration is to determine the threshold between simply the use of substance or substance intoxication. Description in the ICD 11 mentions substance intoxication as occurrence of "clinically significant disturbances in consciousness, cognition, perception, affect, behaviour, or coordination that develop during or shortly after the consumption or administration". Hence there is a leeway for the clinician to determine what is considered as 'clinically significant'. One way to simply operationalize is to consider any encounter with substance use which has resulted in abovementioned mental or neuropsychiatric disturbances and are brought to the emergency/ clinical setting as 'clinically significant' (those situations where these disturbances are expected by the person, and are found to be pleasurable would be considered simply as use). The disturbances are described as transient and reversible and hence they are expected to abate with time.

Patients with substance intoxication also may have an issue related to their mental competence. Substances of use may result in impairment of judgement or consciousness. This may result in impairment of competence, i.e., the ability of the person to comprehend the choices, decide a course of action, and communicate their choice back. This lack of competence has a bearing on treatment choices that should be instituted, and promulgation of coerced treatment. It is generally accepted that when a person is not found to be competent, the nominated representative can be the proxy decision maker for the person. The treatment providers can also institute emergency treatment in the best interests of the patient. Furthermore, substance intoxication is reversible process, so if emergency treatment is not required, then one can wait for the patient to re-attain competence as the substance intoxication wanes.

A clinical consideration for patients with substance use disorders is the concurrent use of many substances together. This may lead to the clinical picture being altered or complicated by the features of intoxication or withdrawal from different substances. For example, a patient with opioid dependence may have sedation during intoxication. If benzodiazepines or alcohol are used concurrently with opioids, then the sedation may be accentuated. In such a patient, reversal using naloxone may offset the features of intoxication with opioids, but not reverse the effects of benzodiazepines. Similarly, intoxication with cocaine and other stimulants may lead to paranoia, which may be accentuated with consumption of higher than usual amounts of cannabis. Thus, a clinician needs to be open to the idea of multiple substance consumption in a patient with substance intoxication.

Another issue in the clinical management of patients with substance intoxication is the lack of social support in the treatment process. Patients may be consuming substances alone or it is possible that casual acquaintances do not intend to help or are not in a position to help (due to their own intoxication as well). Family and friends may be disinclined or burnt out due to the substance use disorder and hence may not be forthcoming in engaging with the care process. Thus, the ancillary supports available in the treatment process of patients with substance intoxication may be few. Sometimes, police or other bystanders may bring a patient with substance intoxication to the emergency and the identity of the patient may be unknown to

them. Thus, clinicians may have to work with limited information and work in the best interests of the patient.

There may be legal concerns with the consumption of certain substances, which are considered illegal under the Narcotic Drugs and Psychotropic Substances Act, 1985. This may make patients hesitant to disclose use of some of the substances, for example, heroin. Treating psychiatrists might also be apprehensive about documentation. However, it should be reiterated that clinicians can help patients better if they are able to get a reliable history. Thus, it would be preferable to gather detailed information, and document suitably, while at the same time ensuring confidentiality of the treatment records and providing reassurance about this to the patient. It might also be prudent to get urine or blood testing for substances of abuse, ensuring safe chain of custody of possession of the sample. It is unlikely that such treatment records are referred to by legal process, but a psychiatrist may need to present the relevant information to the courts when requested through due process.

Figure 1: Challenges in assessment and management of patients with substance intoxication

Unreliable/ incomplete history	Agitation or violence	Intent to harm self	Diagnostic threshold
Lack of competence (at least temporarily)	Use of multiple substances together	Lack of supports in treatment	Legal concerns with certain substances
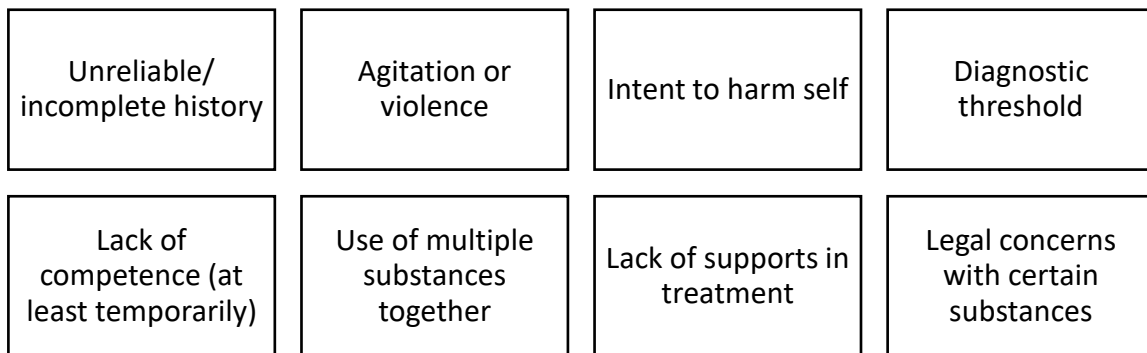
General signs of intoxication

As specified in ICD-11, intoxication with one or more psychoactive substances may be suspected in cases of-

1. Transient and clinically significant disturbances in consciousness, cognition, perception, affect, behaviour, or coordination that develop during or shortly after the consumption or administration of the substance.
2. The symptoms must be compatible with the known pharmacological effects of the substance, and their intensity is closely related to the amount of substance consumed.
3. The symptoms of intoxication are time-limited and abate as the substance is cleared from the body.
4. Symptoms are not better accounted for by another medical condition or another mental disorder

Table 1 enumerates signs and symptoms of intoxication with different substances

Table 1: features of intoxication with common psychoactive substances

Substance	Signs	Dysfunctional behaviours
Alcohol	Unsteady gait, slurred speech, nystagmus, flushed face, conjunctival injection, decreased	Disinhibition, argumentativeness, aggression, inattention, lability of mood, impaired judgement and

	levels of consciousness	functioning
Cannabis	Increased appetite (munchies), dry mouth, tachycardia, conjunctival injection	Euphoria, disinhibition, suspiciousness, anxiety, agitation, sense of slowing of time, rapid flow of ideas, inattention, slow reaction time, hallucinations and illusions, impaired judgement
Opioids	Drowsiness, slurred speech, constricted pupils, decreased levels of consciousness	Apathy, sedation, disinhibition, psychomotor retardation, inattention, impaired judgement and functioning
Benzodiazepines	Unsteady gait, slurred speech, nystagmus, flushed face, conjunctival injection, decreased levels of consciousness, erythematous skin lesions or blisters, hypothermia, hypotension, depressed gag reflex	Euphoria, apathy, disinhibition, sedation, lability of mood, aggression, inattention, anterograde amnesia, impaired psychomotor functioning
Stimulants (including cocaine)	Tachycardia, arrhythmias, hypertension, sweating and chills, nausea, vomiting, psychomotor agitation, dilated pupils, chest pain, muscle weakness, convulsions	Euphoria, increased energy, hypervigilance, ideas of grandiosity, aggression, lability of mood, suspiciousness, hallucinations and illusions
Hallucinogens	Tachycardia, sweating and chills, palpitations, tremors, blurring of vision, pupillary dilatation, inco-ordination	Anxiety, fearfulness, illusions and hallucinations, suspiciousness, lability of mood, hyperactivity, impulsivity, inattention
Volatile solvents	Unsteady gait, slurred speech, nystagmus, decreased levels of consciousness, muscle weakness, blurred vision, diplopia	Apathy, lethargy, aggression, lability of mood, impaired attention and memory, psychomotor retardation

General management approach for substance intoxication in emergency setting

Assessment of a patient presenting with intoxication aims at identifying the immediate risks to the patient and attendants along with uncovering maladaptive patterns of substance use that may require specialized management and care. Management approach is briefly outlined in figure 2.

1. *Clinical history*

a. Elicit details of current episode of substance use- nature, amount, preparation, duration, route, mixing with other substances, etc.
b. Ask for similar details about previous similar episodes.
c. Elicit, wherever possible, events of high-risk behaviours under intoxication- driving, operating heavy machinery, self-harm or violence towards others.
d. Attempt should be made, wherever possible, to identify dependence or harmful use pattern.
e. It is important to identify any comorbid psychiatric illness and elicit details of treatment and whether the patient is currently on any psychotropic medication, in order to understand drug and substance interactions.

2. *Physical Examination*
   a. Assess levels of consciousness (The Glasgow Coma Scale may be used), cardiac and respiratory parameters (heart rate, blood pressure, cardiac rhythm, respiratory rate) and urine output, preferably with hourly intervals until parameters begin to normalize.
   b. Unresponsive patients may suffer from an occult head injury, which may be identified from increased intracranial pressure. It is thus advised to perform a direct ophthalmoscopy looking for papilledema, which is a clinical sign for increased intra-cranial pressure. Imaging (CT/MRI) may be required to determine definitive management.
   c. In responsive patients, rule out diplopia, assess eye movements in all cardinal positions, any muscle weakness and sensory deficits.
   d. Observe for any abnormal or involuntary movements
   e. Check for other physical injuries, bleeding from ear, nose or mouth

3. *Mental status examination*
   a. Assess for speech and behavioral abnormalities- pay special attention to aggressive behaviours, ensure patient and staff safety.
   b. Assess thought and perceptual disturbances
   c. Assess orientation to time and place; immediate, recent and remote memory, insight and reality testing.

Figure 2: General management approach to an intoxicated patient in emergency
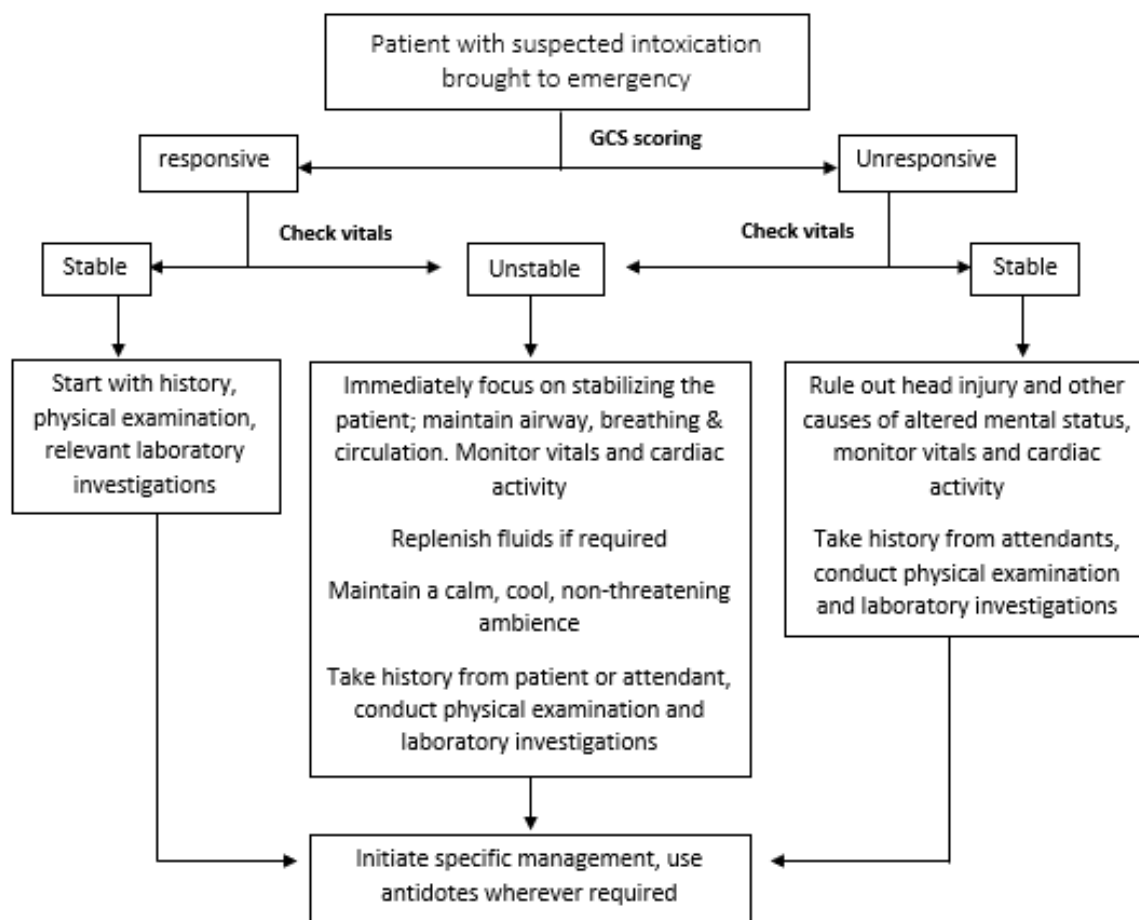
Rule out various differential diagnoses and other causes of altered sensorium-

1. Metabolic causes include hypoglycaemia, electrolyte imbalance, hyperosmolar hypoglycaemic state, diabetic ketoacidosis and metabolic acidosis and may be detected by laboratory investigations including blood glucose, renal function tests and arterial blood gases.
2. Cerebral trauma, cerebrovascular events and meningitis may be identified by CT, MRI and Cerebrospinal fluid analysis
3. Encephalopathies and toxicity with other substances (Methanol, Lithium, Barbiturates, Benzodiazepines, Isoniazid) may be identified by laboratory investigations for serum ammonia, and levels of suspected agents in the blood. Higher serum levels than the therapeutic window indicates toxicity.

Table 2: differential diagnoses of intoxication with various substances

Suspected substance of intoxication	Common differential diagnoses
Alcohol	Benzodiazepine use, cannabis use, hypoglycaemia, electrolyte imbalance, hyperosmolar hypoglycaemic state, diabetic

	ketoacidosis and metabolic acidosis
Cannabis	Intoxication with other substances of use like cocaine, Lysergic acid diethylamide (LSD), MDMA (ecstasy), amphetamines, acute psychotic episode or hypomanic episode
Opioids	Head injury, meningitis or encephalitis, systemic infections, hepatic or other metabolic encephalopathy, diabetic ketoacidosis or hypoglycaemia, electrolyte disturbances, Wernicke's encephalopathy, and hypoxia/hypercapnia due to pre-existing respiratory conditions.
Benzodiazepines	Alcohol use, opioid use, Head injury, meningitis or encephalitis, systemic infections, hepatic or other metabolic encephalopathy, hypoglycaemia, hypernatremia, systemic infection, respiratory tract infection, acute cardiac event and stroke
Stimulants	Delirium, thyrotoxicosis, alcohol withdrawal, acute coronary syndrome, electrolyte imbalance, metabolic encephalopathies, malignant hyperthermia, manic/hypomanic episode and stroke

Emergency management approach

Emergency management ideally should begin with assessment in order to stabilize the patient and mitigate immediate risk to self and others, patient mortality and prevention of further complications due to substance intoxication.

1. *General management*
    a. Maintain airway, breathing and circulation
    b. Provide intravenous fluids to counter dehydration and to maintain urine output
    c. Hypoglycaemia should be corrected with oral glucose, if conscious level permits, or else with 5% or 10% IV dextrose
    d. Maintain ambient room temperature, with quiet surroundings and minimal disturbance.
    e. Atleast 1 ECG should be obtained for all heavily intoxicated patients and for those with known cardiovascular conditions.
    f. In the case of altered mental status, when a full history cannot be elucidated, a CT scan of the head should be obtained to rule out any intracranial pathology contributing to the patients' mental status. MRI maybe considered if an intracranial pathology is suspected
    g. Many intoxicated patients may state suicidal thoughts or make such gestures. A psychiatric evaluation should be performed and may have to be repeated as the patient becomes more lucid.

2. *Laboratory investigations*
    a. Blood glucose, plasma electrolytes and blood gases should be measured every 4 hours in patients with altered sensorium until recovery is assured
    b. Urine toxicology screen may be performed if needed to check for presence of narcotics and sedatives
    c. Complete blood counts to detect megaloblastic anaemia
    d. Liver function tests when prolonged harmful pattern of alcohol use is suspected

e. Renal function tests in cases of altered sensorium, poor urine output or if behavioral features are out of proportion to the amount of alcohol consumed.

3. *Symptomatic management*
   a. Drugs like sedative-hypnotics may be used with caution to avoid over-sedation
   b. Intravenous fluids may be required
   c. Drugs like haloperidol, Risperidone etc. may be used to control aggression
   d. Specific antidotes may be administered as required

4. *Consider in-patient admission if patient has:*
   a. Severe intoxication
   b. Medical complications such as Wernicke encephalopathy, alcoholic hepatitis, dysrhythmias or convulsions
   c. Persistent disorientation
   d. Continued abnormality in cardio-pulmonary parameters
   e. Known chronic systemic illnesses that requires medical attention independently
   f. Prolonged aggressive behaviour, perceptual abnormalities
   g. Homeless patients, adolescents, elderly, patients with poor psycho-social support

The speciality under which the patient needs to be admitted can be determined according to the indication for admission.

Details of intoxication with specific substances are discussed in the following section.

Alcohol intoxication in emergency setting

Alcohol (primarily) is a widely used psychoactive substance globally and in India. In people aged 20–39 years, approximately 13.5% of global deaths are attributable to alcohol. The harmful use of alcohol is a causal factor in more than 200 disease and injury conditions. Data from National Syndromic Surveillance Program, which included non-fatal ED visits from facilities in 49 states and Washington, DC indicated that in 2020, 1.8% of the total annual Emergency visits were related to alcohol use.

Of the many alcohol-related disorders presenting to emergency services in India, a vast majority presents with road traffic accidents due to driving under intoxication followed by acute alcohol poisoning, which is defined as ingestion of a large amount of alcohol in a short duration of time (4).

Clinical features of alcohol intoxication

Alcohol is a global CNS depressant. Acute ingestion generally results in elevation of mood, disinhibition and increased confidence leading to argumentative or combative behaviour. In addition to those mentioned in table 1, some features of alcohol intoxication seen with increasing blood alcohol concentration (BAC) are discussed in Table 3. In naïve drinkers, blood alcohol concentrations of 150–250 mg/100 ml are usually associated with clinically apparent intoxication; concentrations of 350 mg/100 ml are associated with stupor and coma; while concentrations of >450 mg/100 ml are often fatal. Individuals who habitually misuse alcohol often develop tolerance to its effects and are significantly less likely to develop

intoxication than non-habitual drinkers (5). Effects can last from 2-3 hours after a few drinks to up to 24 hours after heavy drinking.

Table 3: Effects of increasing Blood Alcohol Concentration

Stage	BAC (mg/100mL)	Clinical Features
Reduced Awareness, Information Processing and Visual Acuity	10 to 100	• More self-confident or daring • Shortened attention span • Overconfident • Poor judgment • Unpredictable, impulsive, careless, distractive
Reduced Muscle Coordination	100 to 180	• Loss of judgment • Trouble understanding or remembering things • Does not react to situations as quickly • Body movements uncoordinated • Poor balance • Blurry vision, side vision impaired, loss of glare recovery • May have trouble sensing things (hearing, tasting, feeling, seeing) • Indecisive, unreasonable
Confusion	180 to 250	• Confused, could be disoriented to time and place • Dizzy and may stagger • Emotional lability • Cannot see clearly • Sleepy • Slurred speech • Uncoordinated movements
Stupor	250 to 350	• Can barely move • Cannot respond to stimuli • Cannot stand or walk • Nausea, vomiting • May lapse in and out of consciousness
Coma	350 to 450	• Unconscious • Reflexes depressed (pupils do not respond appropriately to changes in light) • Hypothermia • Breathing is slower and more shallow • Bradycardia • Arrhythmias may be precipitated (Holiday Heart Syndrome) • May result in death

Assessment of alcohol intoxication

1. Acute alcohol intoxication causes several metabolic abnormalities, including lactic acidosis, hypoglycaemia, hypokalaemia, hypomagnesemia, hypocalcaemia, and hypophosphatemia.
2. Laboratory analysis should include a full electrolyte panel, Arterial Blood Gas (ABG) levels, complete blood counts as well as liver function tests.
3. Alcohol can cause acute effects on the cardiovascular system, such as atrial and ventricular tachyarrhythmias. Electrocardiogram and 2-D Echocardiography may be required for definitive diagnosis.

Management of alcohol intoxication in emergency setting

Adults with mild to moderate intoxication can be managed satisfactorily in relatively simple surroundings with a minimum of medical support, but those who are severely intoxicated should be admitted and nursed in a high-dependency setting (4,6). Treatment for acute ethanol toxicity is mostly supportive. The main life-threatening complication of alcohol intoxication is respiratory depression.

Routine use of thiamine is recommended for patients with alcohol use disorder, especially in the setting of altered mental status. Detecting occult thiamine deficiency and Wernicke encephalopathy is difficult, and this condition has a high mortality. Thus, prophylactic thiamine may be administered to patients who appear at risk of developing thiamine deficiency (prolonged use of alcohol, poor nutritional status, confused mental state, gait abnormalities, ophthalmoplegia) (7). Usual dose should be atleast 250 mg of thiamine daily intramuscularly for 3–5 days, followed by oral thiamine 100 mg daily (8). It is important to remember that in an emergency setting, thiamine is to be administered before glucose replenishment so that the glucose gets utilized in ATP generation (which utilizes thiamine as a co-factor), preventing sequestration of the already limited thiamine which may precipitate Wernicke's Encephalopathy.

A brief schematic flowchart for management of alcohol intoxication in emergency is presented in Figure 3.

1. *General management*
   a. Maintain airway, breathing and circulation
   b. Provide intravenous fluids to counter dehydration and to maintain urine output
   c. Hypoglycaemia should be corrected with oral glucose or 5% or 10% IV dextrose
   d. Maintain ambient room temperature, with quiet surroundings and minimal disturbance.
   e. "Holiday heart syndrome," characterized by new-onset arrhythmias may develop following acute ingestion of alcohol and can include new-onset atrial fibrillation. Serial ECG monitoring should be done if an arrhythmia is found, as a majority will resolve with the physiological elimination of alcohol. If the ECG changes persist, an alternate cause should be considered.

5. *Laboratory investigations*
   a. Blood glucose, plasma electrolytes and blood gases
   b. Urine toxicology screen may be performed if needed to check for presence of narcotics and sedatives

c. Complete blood counts to detect megaloblastic anaemia
d. Liver function tests
e. Renal function tests
f. Blood alcohol levels may be required in medicolegal cases
g. Whole blood thiamine levels may be measured in patients at risk of Wernicke's encephalopathy.

6. *Symptomatic management*
   a. Control aggression by adopting a concerned and non-threatening demeanour
   b. Sedatives should be used judiciously to avoid oversedation
   c. Metadoxine (given as a single IV/IM injection of 300-600 mg) may be used to accelerate the elimination of alcohol in adults
   d. For agitated patients sedatives may be required, including haloperidol, keeping in mind the potential interaction between the drug and alcohol.

Figure 3: Management of alcohol intoxication in emergency setting
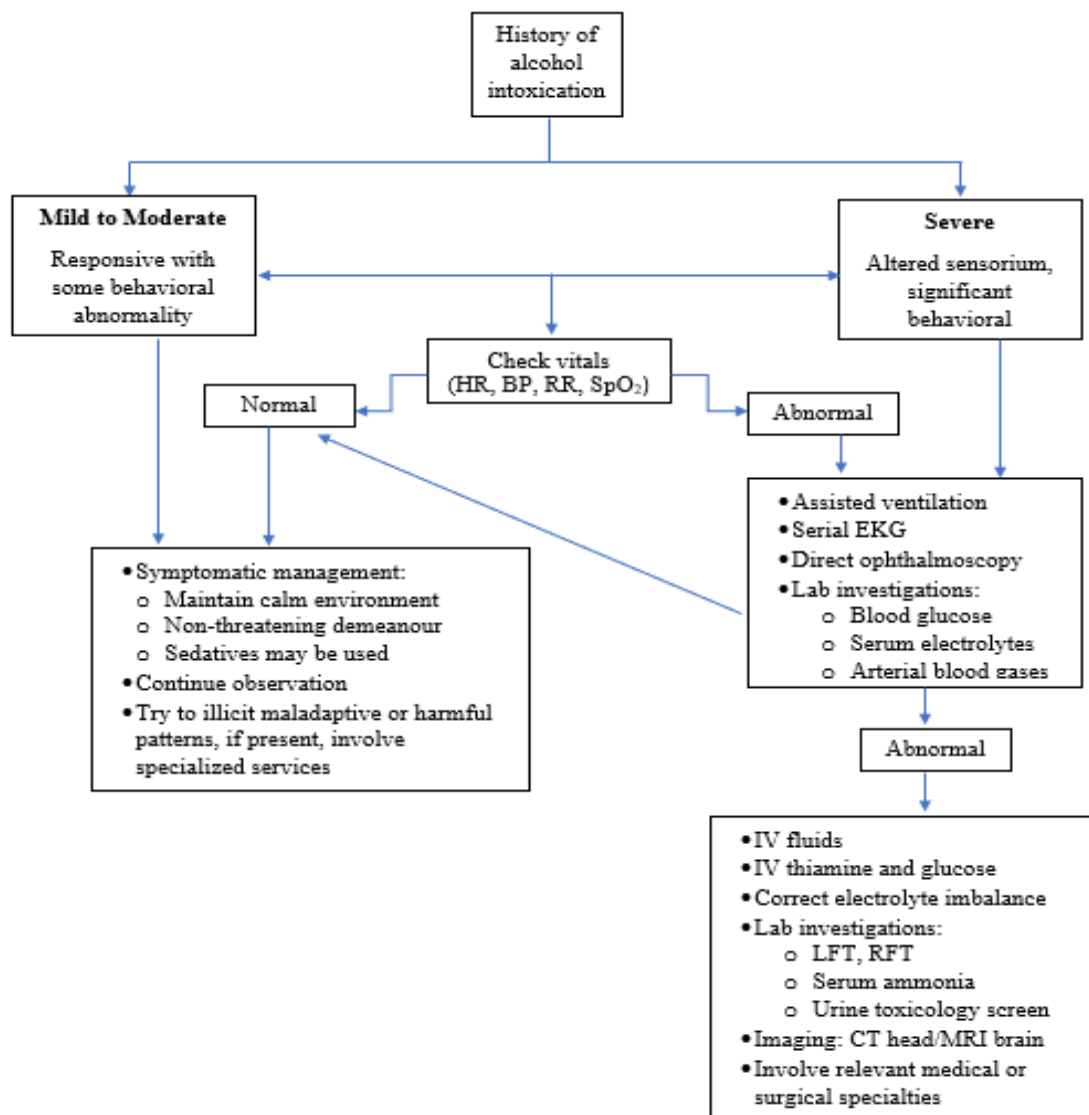
Disulfiram Ethanol Reaction

Disulfiram is commonly used as a deterrent to ethanol use. It acts as an inhibitor of Aldehyde dehydrogenase, an enzyme that metabolizes acetaldehyde produced from ethanol into acetate. Inhibition of Aldehyde dehydrogenase in the presences of ethanol, leads to accumulation of Acetaldehyde, a toxic compound that produces a constellation of unpleasant symptoms, known as Disulfiram-ethanol reaction (DER).

The disulfiram-alcohol reaction usually begins about 10 to 30 minutes after alcohol is ingested. Its adverse effects range from moderate to severe depending upon the quantity of ethanol ingested. Symptoms of DER are presented in table 4.

Table 4: symptoms of Disulfiram-ethanol reaction

Severity	Features
Mild	Flushing, headache, sweating
Moderate	Nausea, tachycardia, palpitations, hypotension, dyspnoea
Severe	Vomiting, dizziness, respiratory depression, cardiovascular collapse, unconsciousness, convulsions, death

Treatment in emergency setting involves stabilization and monitoring. Provide supplemental oxygen, obtain intravenous access, and place all patients on a monitor. Thiamine and glucose maybe administered to patients with altered mental status, as needed. Intravenous fluids should be instituted if hypotension, tachycardia, or severe vomiting is present. Patients with coma or a severely altered mental status should be intubated for airway protection. The frequent occurrence of vomiting secondary to DER places these patients at high risk for aspiration. No specific antidote has been tested for efficacy in the treatment of DER or acute disulfiram overdose, though fomepizole has the theoretical benefit of blocking ethanol metabolism to acetaldehyde and may be a useful therapy in patients presenting with DER. Metoclopramide, ondansetron, or granisetron are considered the antiemetics of choice for intractable vomiting.

Decontamination procedures are not likely to be beneficial once the reaction begins. Consider gastric emptying only in the hospital setting with cases of massive ethanol ingestion in which a patent and protected airway can be maintained. Use of multiple- dose activated charcoal may be considered, as it can increase the rate of elimination of disulfiram and its metabolites that undergo enterohepatic recirculation. The risk-benefit of administering charcoal to a patient with altered mental status and a high likelihood of vomiting and potential aspiration must be carefully weighed. Inducing emesis with ipecac syrup is not recommended. Ipecac syrup contains ethanol, which could precipitate DER. Emesis may delay administration of activated charcoal, worsen the nausea and vomiting associated with disulfiram toxicity, and increase the likelihood of pulmonary aspiration if seizures and coma suddenly occur.

Cannabis intoxication in Emergency setting

Cannabis is the commonest illicit substance of abuse in India. Cannabis intoxication sometimes presents to the emergency setting after consumption (either inhalational or oral) of high amounts of cannabis. It usually presents in those who have never tried cannabis before, and experience severe psychiatric or medical manifestation of cannabis consumption.

Clinical features of cannabis intoxication

Cannabis intoxication manifests with several symptoms as mentioned in table 4 (9).

1. There can be several physical symptoms of cannabis intoxication. These include tachycardia, tachypnoea, increased blood pressure, dry mouth, nystagmus, increased appetite, and rarely precipitation of arrhythmias, angina or myocardial infarction.

2. Mental status changes include alteration in perception of time, with the perceived time being faster than clock time. There may be hallucinations, primarily auditory ones, and a sense of depersonalization. There may be motor incoordination, and impaired attention, concentration and judgement.

3. The cognitive and psychomotor features of intoxication may manifest up to 3 hours after consumption of cannabis. This may lead novice users to consume higher amount and experience dysphoria, anxiety, perceptual alterations and cognitive changes to a higher than anticipated extent. These features may last even for 12 to 24 hours after the consumption of cannabis due to accumulation in the adipose tissue and gradual release afterwards.

Table 4: Features of cannabis intoxication

Tachycardia
Increased blood pressure, or rarely, orthostatic hypotension
Conjunctival injection (reddening of eyes)
Dry mouth
Increased appetite
Nystagmus
Increased respiratory rate
Rarely arrhythmias, angina, or myocardial infarction
Rarely pneumomediastinum and pneumothorax caused by deep inhalation or breath holding
Changes in mood: euphoria, dysphoria or anxiety
Perceptual changes: colours and music perception altered
Time perception may be distorted
Distorted spatial perception
Hallucinations
Depersonalization
Delusions or paranoid thinking
Impaired attention and concentration
Slowed reaction time
Impaired motor co-ordination
Impaired judgement

Assessment of patients with Cannabis intoxication

The assessment of cannabis intoxication is through elaboration of the history and conduct of the examination, supplemented with some laboratory investigations.

1. Urine drug screen for confirmation of cannabis use and detection of other psychoactive substances.

2. Urine ELISA for objective information about consumption of cannabis. One has to be cautious about the urine false positive for cannabis due to non-steroidal anti-inflammatory drugs (NSAIDS) ibuprofen and naproxen, and efavirenz.
3. Intoxication with other substances of use like cocaine, Lysergic acid diethylamide (LSD), MDMA (ecstasy), amphetamines, and synthetic cannabinoids may be ruled out.

Management of cannabis intoxication in emergency setting
Management of cannabis intoxication in the emergency setting can be initiated with general supportive measures. In most cases, the intoxication would pass off in a few hours.
1. Patient may be given benzodiazepine, orally if the patient is accepting the medication orally. Clonazepam 0.5 mg or Lorazepam 1 mg can be given in such a situation.

2. If the patient is agitated or violent, then appropriate measures should be taken for the management of agitation or violence. This may include use of antipsychotics (like haloperidol 5mg with promethazine (Phenergan) 25mg, given intravenously or intramuscularly), or sparing use of restraints.

3. Once the patient recovers from cannabis intoxication, he/she should be debriefed and offered counselling, providing information about harms associated with cannabis use. If a cannabis use disorder is identified (harmful use or dependence), then the patient should be suitably referred for further treatment of substance use disorder.

Opioid Intoxication in Emergency setting
Opioids are controlled substances with high potential for dependence. Opioids used commonly include both pharmaceuticals (used generally in the form of medications, like methadone, buprenorphine, tramadol, pentazocine, etc), and illicit preparations (generally used for recreational purposes, like heroin, raw opium). Intoxication with opioids can be intentional (a patient may be taking increased amounts of opioids to get a more intense high, or as an attempt to harm self), or unintentional (a patient may not know the potency of street heroin and hence may inject higher quantity).

Risk factors for opioid intoxication or overdose include escalating doses of opioids, combining opioids with sedative drugs, reuse of opioids after a period of abstinence and presence of comorbid conditions like HIV, depression, liver disease etc.

Clinical features of opioid intoxication

Features of opioid intoxication include somnolence, stupor, psychomotor retardation, slurred speech, mood changes (euphoria followed by dysphoria), respiratory depression, and impaired memory and attention. Pupillary constriction is generally present. The intensity of these symptoms is related to the amounts of opioids consumed, and in severe intoxication, coma may occur. Opioid intoxication can be classified as mild, moderate or severe, on the basis on the level of psychophysiological changes due to the opioids and impairment of the level of consciousness (as mentioned in table 5).
Opioid overdose is a life-threatening condition caused by consumption of excess amounts of opioids, characterised by pinpoint pupils, unconsciousness and respiratory depression. Severe opioid intoxication and opioid overdose may be clinically indistinguishable, and the clinical label of 'opioid overdose' may be more suitable while dealing with such patients presenting

to emergency who have respiratory depression, unconsciousness and pinpoint pupils after recent consumption/administration of large doses of opioids.

Table 5: Features of opioid intoxication and opioid overdose.

Opioid intoxication
Sedation/ somnolence
Psychomotor retardation
Slurred speech
Euphoria, followed by dysphoria
Impaired memory and attention
Respiratory depression
Stupor
Coma
Pupillary constriction (sometimes dilatation due to severe anoxia)
Severity of opioid intoxication
Mild – Changes in psychophysiological functions and responses apparent, with little/no disturbances in the level of consciousness.
Moderate – Changes in psychophysiological functions and responses are marked, with some changes in the level of consciousness.
Severe – Changes in psychophysiological functions are obvious, with marked changes in the level of consciousness.
Opioid overdose
Coma
Respiratory depression
Pinpoint pupils

Assessment for opioid intoxication

The assessment of patients with opioid intoxication aims at ensuring safety of the patient and prevention of irreversible harm to the patient.

1. History is generally obtained from the friends/ family members of the patients. Information of the presence of pills/ injection paraphernalia where the patient was found can be helpful guide to the consumption of opioids by the patient.

2. The onset, duration and the intent of the symptoms of intoxication would vary according to the potency of the opioid and the route of administration. For example, same doses of fentanyl, buprenorphine and heroin are likely to present differently (symptoms are likely to more intense for fentanyl and duration of action may be much longer for buprenorphine).

3. Attempts should also be made to discern the use of sedative hypnotics along with opioids for a given patient. Concurrently with assessment of the patient, emergency measures would need to be instituted for the patient (including attention to the airway, breathing and circulation).

There are some differential diagnoses that may be considered in patients who present with features of opioid dependence. These include head injury, meningitis or encephalitis, systemic infections, hepatic or other metabolic encephalopathy, diabetic ketoacidosis or hypoglycaemia, electrolyte disturbances, Wernicke's encephalopathy, and

hypoxia/hypercapnia due to pre-existing respiratory conditions. Clinical assessment, and laboratory investigations as necessary should be used to rule in or rule out other conditions.

Management of opioid intoxication in emergency setting

Opioid intoxication presents as a medical emergency and can be fatal if the patient is not treated appropriately. The risk of death is primarily due to respiratory depression. Flowchart in figure 4 describes the usual management of patients with opioid intoxication. It must be remarked that effective treatment options are available for the treatment of opioid intoxication in the emergency setting (11).

Intoxication with buprenorphine is rare due to its ceiling effect. But intoxication with methadone may occur in high, irregular and unsupervised doses among patients on methadone maintenance regimes.

Figure 4: Management of opioid intoxication

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┌─────────────────────────────────────────────────────────────────────┐
│ Patient being brought to the emergency: Maintenance of airway,        │
│ breathing and circulation                                             │
└─────────────────────────────────────────────────────────────────────┘
                                    ↓
┌─────────────────────────────────────────────────────────────────────┐
│ Assess oxygenation status: If low saturation (< 93%) or respiratory   │
│ rate less than 8/min, provide supplemental oxygen or mechanical       │
│ ventillation                                                          │
└─────────────────────────────────────────────────────────────────────┘
                                    ↓
┌─────────────────────────────────────────────────────────────────────┐
│ Administer naloxone IV (0.2 mg to 0.4mg - patients in coma, 1 mg to   │
│ 2 mg in patients with apnea or cardiorespiratory arrest)              │
└─────────────────────────────────────────────────────────────────────┘
                                    ↓
┌─────────────────────────────────────────────────────────────────────┐
│ If no improvement, repeat every 2 to 3 minutes (till total dose of    │
│ 10mg) and observe for signs of reveral (pupillary dilatation and      │
│ increase in breathing rate)                                           │
└─────────────────────────────────────────────────────────────────────┘
                                    ↓
┌─────────────────────────────────────────────────────────────────────┐
│ If there is response to naloxone, infusion should be started, 2/3 of  │
│ reversal dose in first hour, half of it in the first 15 minutes       │
└─────────────────────────────────────────────────────────────────────┘
                                    ↓
┌─────────────────────────────────────────────────────────────────────┐
│ After patient regains consciousness, then stop infusion and assess.   │
│ Continue if respration or saturation drops.                           │
└─────────────────────────────────────────────────────────────────────┘
                                    ↓
┌─────────────────────────────────────────────────────────────────────┐
│ If patient maintains well for more than 4 to 6 hours without          │
│ naloxone/ supplemental oxygen, then he/she can be discharged          │
└─────────────────────────────────────────────────────────────────────┘
                                    ↓
┌─────────────────────────────────────────────────────────────────────┐
│ Link up for long term treatment of the patient for opioid dependence/ │
│ other health condition                                                │
└─────────────────────────────────────────────────────────────────────┘
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Antidote administration

Naloxone is a full opioid antagonist which is an important treatment agent for opioid intoxication/overdose. By acting on mu-opioid receptors, it displaces the opioid agonist and reverses the signs and symptoms of opioid intoxication. It has a short duration of action (about 60 to 90 minutes). Generally, it is administered intravenously, but for some patients, when accessing veins is difficult, it can be administered sub-cutaneous, intra-muscular,

endotracheal or intra-nasally. It is administered in doses of 0.2 to 0.4 mg (and higher doses of 1 to 2 mg in cases of patients presenting with apnoea or cardiorespiratory arrest). When patients, show improvement, the improvement occurs within 2 to 3 minutes in the form of pupillary dilatation and increase in the respiratory rate. Some patients may require higher doses to show reversal of opioid intoxication. Doses of naloxone can be repeated every 2 to 3 minutes to a maximal dose of 10 mg. After reaching reversal higher doses should be avoided as naloxone may be associated with vomiting.

In case of response to naloxone, intravenous infusion should be considered in patients of overdose with a longer acting opioids (e.g., buprenorphine), as the patient can fall back into coma as the effect of naloxone decreases. For naloxone infusion, two-thirds of the reversal dose should be given hourly. Half of this dose should be administered over the first 15 minutes and the remaining over the next 45 minutes. For example, if the reversal dose was 1.2 mg, then first hour dose would be 0.8 mg, and 0.4 mg would be administered through infusion in the first 15 minutes. Naloxone can be repeated intramuscularly or subcutaneously if the veins are inaccessible. After reversal and when patient is clinically better, it is useful to observe the patient for 4 to 6 hours after naloxone infusion is stopped, before the patient is discharged.

There is a high risk of overdose again if a patient has overdosed once. Patients who have overdosed with opioids should be offered pharmacological and non-pharmacological treatment for opioid dependence. It has been seen that opioid substitution treatment with buprenorphine or methadone are associated with lower overdose related mortality (12). The reader is referred to the other Indian Psychiatric Society Guidelines on the management of opioid dependence in the clinical population (13).

Benzodiazepine intoxication in emergency setting
Benzodiazepines represent one of the most prescribed and consumed drugs in both outpatient and inpatient settings. Drugs in this group are classified as short acting (Etizolam, Alprazolam, Lorazepam) and long acting (Diazepam, Nitrazepam, Clonazepam). From treating anxiety disorders to sleep disorders, benzodiazepines have a wide range of indications with minimal adverse reactions, compared to other drugs. Although benzodiazepine intoxications only represent a very small proportion of emergency department visits, 31% of all fatal poisonings reported in the United States over the last two decades involved benzodiazepines (14). Thus, it is important that Emergency care providers learn to identify and manage Benzodiazepine overdose, which is defined as ingestion of any drug in the class of benzodiazepines in quantities greater than recommended.

The largest vulnerable groups to present with Benzodiazepine intoxication are children who may ingest it accidentally and elderly, who commonly complain of insomnia and are prescribed benzodiazepines. Deteriorating metabolism and cognitive functioning may become factors responsible for accidental benzodiazepine overdose. Deliberate overdose with an intent to self-harm may also be a possibility that cannot be ignored.

Clinical features of Benzodiazepine intoxication
As indicated in Table 6, features of benzodiazepine intoxication range from mild relaxation and sedation to coma and death.
  1. Physical features include motor incoordination, blurred vision, gait disturbances and slurred speech

2. Behavioral changes include behavioral disinhibition, somnolence, slowed reflexes and breathing, and reduced sensitivity to pain and occasional paradoxical excitement and aggressiveness
3. Cognitive changes include euphoria, confusion, impaired thinking and judgement, stupor and coma

Table 6: features of intoxication with benzodiazepines

Initial feeling of relaxation, mild euphoria and sexual enhancement
Sedation
Large doses produce motor incoordination, blurred vision, slurred speech, impaired perception of time and space, slowed reflexes and breathing, and reduced sensitivity to pain
Impaired thinking and judgement
Still higher doses cause confusion, unconsciousness, coma and death

Assessment for benzodiazepine intoxication

Benzodiazepine overdose is usually suspected or diagnosed based on clinical presentation. Many patients are arousable and can provide supporting information regarding their ingestion. In the acutely poisoned patient who cannot provide an adequate history, a detailed physical examination and a general approach should be undertaken to stabilize the patient. The aims of assessment include definitive identification of benzodiazepine intoxication along with anticipation and prevention of life-threatening risks.

1. *History*

   Elicit details of the drug use: dose, duration, mode of overdose, determine whether benzodiazepines were mixed with other psychoactive substances, similar past episodes and high-risk behaviours like driving or operating heavy machinery and a history of falls or accidents under intoxication.

2. *Physical Examination*
   1. Assess vital signs: pulse, BP, respiratory rate, temperature, SpO_2
   2. Assess level of consciousness- use the Glasgow Coma Scale
   3. Monitor cardiac activity using ECG

3. *Mental status examination*
   1. General behaviour- patients usually appear sedated but responsive. Occasionally paradoxical reaction may occur, characterized by agitation, anxiety, disinhibition, and aggressiveness
   2. Perceptual and thought abnormalities are rare
   3. A detailed CNS examination is warranted, especially in elderly patients, those with known liver or renal disease, history of chronic illness, poor general health condition.

Rule out other causes of acute respiratory depression- Head injury, Encephalitis, hypoglycaemia, hypernatremia, systemic infection, respiratory tract infection, acute cardiac event and stroke.

Management of benzodiazepine intoxication in emergency setting

Treatment of benzodiazepine overdose is mainly supportive. Most effects wear off in a few hours for short-acting and 24-48 hours for long-acting benzodiazepines. However, CNS complication, cardiac and respiratory compromise may contribute to patient mortality unless managed effectively. Before any diagnostic tests are ordered in the patient presenting with altered mental status with suspected overdose or toxicity, any respiratory or abnormal vital signs should be addressed first. Mechanical ventilation may be required to address respiratory compromise and intravenous fluids administered to manage hemodynamic instability.

General management

1. Maintain airway, breathing and circulation
2. Measures to prevent aspiration (lateral position, suction equipment) must be taken.
3. An ECG should be ordered to rule out the ingestion of drugs that may widen the QRS or QTc intervals and may precipitate arrhythmias.
4. Volume expansion may be required for hypotension
5. Correct hypothermia
6. Repeated evaluation of neurological status and respiratory functions are needed.

Laboratory investigations

1. Routine testing for the acutely poisoned patient.
2. Urine toxicology screen for benzodiazepines and other psychoactive substances
3. Determination of benzodiazepine serum levels (parent drugs and metabolites) may occasionally help to differentiate drug-induced CNS depression from other aetiologies, although there is no strong correlation between serum concentrations and clinical presentation.
4. A chest X-ray must be obtained in comatose patients or those with respiratory compromise to rule out aspiration pneumonia.

Prevention of absorption of Benzodiazepines

1. Consider Gastrointestinal decontamination using a single tablet of activated charcoal via naso-gastric tube in cases of heavy ingestion with intended self-harm, co-ingestion with other substances like antidepressants and if the patient is brought to you in less than 1 hour after ingestion.
2. Invasive procedures like induced emesis, gastric lavage, bowel irrigation should be avoided.
3. Multiple doses of activated charcoal, enhanced diuresis, and extracorporeal techniques (e.g., haemodialysis, haemoperfusion) are not indicated.

Antidote administration
Flumazenil is a benzodiazepine receptor competitive antagonist with no significant intrinsic effect. Flumazenil is useful in hastening reversal of benzodiazepine-induced CNS impairment (15).

Dose: In adults, the initial dose consists of 0.1–0.2 mg/minute intravenously over 30 seconds It may be repeated in doses of 0.1mg after 1-minute intervals until sufficient alertness and adequate respiration are obtained or up to a maximum dose of 1–2 mg.

Arousal occurs 30–60 seconds after intravenous administration, peaks after 5–10 minutes and lasts for 1–2 hours. To prevent re-sedation, continuous infusion (usually 0.5–2 mg/hour) may be needed to maintain the effect

In children, an initial intravenous dose of 0.01 mg/kg and a maximal total dose of 0.05 mg/kg are recommended.

Slow injection (0.2mg over 15 seconds) is recommended because of the frequent side effects associated with sudden arousal, including seizures, cardiac arrhythmias (particularly PSVT), anxiety, palpitations, nausea, and vomiting. Flumazenil is expensive and has limited availability in India, thus, not routinely recommended for routine use.

Flumazenil can be safely administered to non-habituated users of benzodiazepines but avoided in patients with history of seizure disorders, benzodiazepine dependence and head injury.

Intoxication with other substances

Cocaine, amphetamines and other stimulants

Though cocaine and other stimulants have traditionally not been commonly abused in India, their use is gradually rising, especially in bigger cities, states sharing geographical boundaries with other nations certain other tourism reliant places.

The worldwide prevalence of amphetamine use is estimated to be 0.3% to 1.1% as per the United Nations Office of Drugs and Crime data from 2013. Misuse of amphetamines has been increasing in the United States as the hospital admissions increased by more than 500% between 1992 and 2002. Men have a higher prevalence of amphetamine misuse compared to women. The overall prevalence of methamphetamine use in the United States in individuals aged 12 or older was 4.7% in 2013 as per the National Survey of Drug Use and Health.

Clinical presentation

1. The presentation of cocaine intoxication is in the form of euphoric mood, increased psychomotor activity, severe agitation, impaired attention, auditory hallucinations, paranoid ideation, confusion, anxiety and hypervigilance.

2. Some patients may manifest skin-picking (formication).

3. Cocaine has sympathomimetic effects and may result in hypertension, tachycardia, hyperthermia, diaphoresis, and mydriasis.

4. Similar actions are also produced by other stimulants (like amphetamine and methamphetamine). Amphetamines cause tachycardia and hypertension and can cause significant cerebral blood flow which increases by 30%.

5. Some patients may have seizures or chest pain due to cardiac ischaemic changes.

Clinical assessment and management

Management of intoxication with cocaine, amphetamines and stimulants is generally symptomatic (16).

1. Patients can be placed in a quiet room/ area if possible.

2. Vital signs monitoring and Baseline investigations- serum electrolytes, ECG, Troponin T (in patients with chest pain), renal function tests.

3. Patients can be given benzodiazepines for sympathomimetic symptoms and agitation or seizure. Benzodiazepines like lorazepam 2 mg can be given orally, intramuscularly or intravenously, and repeated as necessary.

4. For acute agitation and paranoia, patient may need injectable antipsychotics on a short-term basis (though antipsychotics are not required in the absence of a concurrent psychotic disorder or stimulant/cocaine-induced psychotic disorder.

5. Very rarely, patients may need restraints. Patients may be given intravenous fluids for dehydration and exhaustion.

6. Aspirin and nitro-glycerine are given for chest pain related to cocaine. Patients with cocaine or stimulant intoxication become asymptomatic over a period of hours to within a day.

After resolution of the intoxication, the patient may be referred for treatment of the cocaine/stimulant use disorder.

Hallucinogens

"Hallucinogen" describes substances whose primary effects include the alteration of sensory perception, mood, and thought patterns. Several hallucinogens may cause features of intoxication, and these include LSD, and phencyclidine. Lysergic acid diethylamide (LSD) is the most extensively studied of such drugs. Hallucinogen use occurs worldwide, although the prevalence is relatively lower than other drugs of abuse. In some parts of the world, LSD has been surpassed as the most common hallucinogen by some newer psychoactive substances, such as synthetic cannabinoids (eg, K2, spice) or "club drugs," and naturally occurring hallucinogens, psilocybin and Salvia divinorum. This is probably related to a number of factors, including erratic supply of LSD, rapid emergence of new psychoactive substances, and easier availability of other hallucinogens via the internet.

Clinical presentation
Most hallucinogens produce sympathomimetic effects. Symptoms of hallucinogen intoxication include:
1. Physical symptoms including tachycardia, hypertension, mydriasis, hyperthermia, and diaphoresis, but these are generally mild. sweating, palpitations, blurred vision, tremors and lack of coordination. Patients may experience elevated blood pressure, tachycardia, and pupillary dilatation.
2. Perceptual changes such as hallucinations, depersonalization and derealization, illusions, synaesthesia
3. Affective changes like anxiety or dysphoria, aggression, fearfulness, paranoid ideation, impaired thinking and judgment.

Management of hallucinogen intoxication is symptomatic (17). The effects generally wear off within a day or so. Management relies on placing the patient in a quiet room with minimal stimulation. Patients should be reassured.

1. General assessments, investigations and measures to stabilize vitals need to be taken.
2. Benzodiazepines like clonazepam or lorazepam can be used to calm the patient.
3. If the patient is amenable to oral medications, then oral medications can be used, else injectable medications can be resorted to.
4. Rarely, injectable antipsychotics and physical restraints would need to be used for such patients. After resolution of the intoxication, the patient should be counselled, and advised seeking treatment if hallucinogen related disorders are identified.

Volatile solvents

Volatile solvents are liquids that readily vaporize into gases. When inhaled, these gases can cause a state of intoxication and long-term nervous and organ damage. There are a variety of volatile solvents that are used by individuals. These include glue, gasoline, spray paints, paint thinners, ink-eraser fluids, nitric oxide, and poppers (alkyl nitrites). Volatile solvents are found in many common household products, such as adhesives, paint, and cleaning fluid. Thus, children and adolescents can easily obtain them.

Psychiatric effects of poppers are typically temporary and last minutes. In India, glue, petrol, ink eraser fluids are commonly used. Users of inhalants are generally children and adolescents, though many adults also consume inhalants.

Clinical presentation
The features of inhalant intoxication include:

1. Euphoria, aggression, dizziness, impaired judgment, lethargy and apathy
2. Somnolence, stupor or coma, tremor, slurred speech, in coordination, unsteady gait, psychomotor retardation, and visual disturbance. Patients may have muscle weakness and diplopia.
3. Inhalants may result in agitation and psychosis (pseudo-hallucinations, hallucinations, and ideas of grandiosity).

Clinical assessment and management

Management of patients with inhalant intoxication is largely symptomatic (18).

1. Monitoring of oxygenation and ventilation is needed, along with maintaining the airway.
2. Some patients may have arrhythmias after intoxication with inhalants, and hence an ECG may be useful for such patients.
3. Supplementary oxygen and intravenous fluids can be used for the patients.
4. Benzodiazepines like lorazepam 1 to 2 mg can be used for agitation or psychosis.

The intoxication generally abates after a short period of time, and patient improves. Regular users of inhalants should be further referred for treatment.

Polysubstance use

Sometimes healthcare providers working in emergency settings may encounter patients with a history of polysubstance use- which means, consumption of more than one drug at once.

The substances involved could be illicit, prescription drugs or a combination of both. Alcohol, benzodiazepines and cannabis are common substances used in combination with other psychoactive substances. Multiple substances are generally mixed together with the aim of enhancing the psychoactive effect, off-setting the adverse effects and to alleviate the withdrawal symptoms.

Specific short-term and long-term effects related to polysubstance misuse differ according to the particular combination of substances; however, there are some general dangers associated with polysubstance misuse. These include:

1. **Increased severity of adverse effects:** When substances are misused together, the potential severity of adverse effects increases exponentially. General adverse effects from polysubstance misuse may include nausea, vomiting, body pain, balance issues, altered levels of consciousness and changes in heart rate, respiration rate, and blood pressure.

2. **Physical complications:** Various diseases are more common in those who misuse multiple substances. For example, chronic diseases, such as hepatitis C, are often seen in heavy drinkers who inject drugs, and tobacco smokers who use cocaine are more at risk for myocardial infarction. Opioids and benzodiazepines taken together may additively potentiate respiratory depression and alcohol and cannabis taken together may worsen CNS depression.

3. **Comorbid mental health conditions:** Substance misuse often worsens the symptoms of the mental health disorder, and likewise, the mental health issue can lead to worsened substance misuse. When multiple substances are misused, all these effects are amplified.

Intoxication with multiple substances
Risk of intoxication and overdose is heightened exponentially when multiple substances are consumed together. This could be either due to mutual potentiation of individual drugs' effects or due to inadvertent consumption of greater amounts of substances in an intoxicated state. Thus, intoxication with multiple substances presents with a complicated clinical picture that is difficult to diagnose (15).

Common symptoms of polysubstance intoxication can include:
1. Drowsiness, sleepiness, and inability to wake
2. Chest pain and heart palpitations (especially when multiple stimulants have been mixed)
3. Stomach pain, nausea, vomiting, and diarrhoea
4. Feeling overly hot or cold and having skin that is sweaty or very dry
5. Slurred speech and inability to complete normal tasks

Management of intoxication with multiple substances in emergency setting
There are no fixed guidelines for treatment and the healthcare professional is required to employ careful observation, thorough assessment and early intervention in order to prevent complications (19).

Diagnosis and assessment
1. **History**- Details of consumed substances, if available, should be elicited from patient if responsive and attendants. It is advisable to refer to medical records, if available, for relevant information on substance use history and prescription details. Any past episodes of overdose or seizures should be noted. It is important to identify any comorbid psychiatric illness and elicit details of treatment and whether the patient is currently on any psychotropic medication, in order to understand drug and substance interactions.

2. **Physical examination**- monitor vital signs (heart rate, blood pressure, respiratory rate, temperature, SpO_2), serially assess consciousness levels. Perform a complete physical examination- look for pupil size, peripheral cyanosis, characteristic odours emanating to from nose or mouth, needle track marks or any other tell-tale signs that may help identifying the substances consumed. In addition, a complete systemic examination with special attention to CNS and cardio-pulmonary systems is necessary.

3. **Laboratory investigations**- Arterial Blood Gases, blood glucose levels, liver and renal function tests, serum electrolytes along with a urine drug screen for detection of psycho-active substances prove helpful in such scenarios. Other investigations may be ordered based on the combination of substances consumed.

Immediate management
Managing polysubstance use in Emergency Department aims at preventing and managing life threatening complications of consumption of multiple psychoactive substances. Reversing the effects of these substances might be attempted with extreme caution in only a small number of cases depending on the substances consumed, the clinical presentation, the patient's past medical and drug related history and other situational factors. In-patient hospitalization and observation may be advised once the patient is stabilized.

While definitive management varies from case to some standard practices are enumerated as follows:
1. Monitor vital signs and cardiac parameters with serial ECG monitoring
2. Prevent aspiration by placing the patient in left lateral position
3. Provide ventilatory support when required
4. Correct hyper- or hypo-thermia
5. Intravenous fluids may be required
6. Inotropes may be needed to correct bradycardia
7. Definitive management depends on confirmed report of the nature of substances consumed
8. Sedatives may be used judiciously to avoid worsening respiratory depression
9. Antidotes like naloxone and flumazenil may be used with caution to avoid unmasking effects of substances with opposing psychoactive effects
10. Observation for atleast 24-48 hours may be advised for any residual effects and detailed assessments

It is desirable to involve specialized services- Addiction Psychiatry or Psychiatry, for detailed assessment once the patient is conscious and responsive. This may provide a good opportunity for intervention and long-term engagement with treatment services.

Substance intoxication in special populations

Substance use has now emerged as a universal phenomenon with no population group immune to its effects. Certain population groups require unique considerations while managing substance intoxication in emergency settings and in specialized treatment services due to their unique physiological and psycho-social needs. In this section, we will discuss 3 special groups of such populations- children and adolescents (age less than 18 years), pregnant women and elderly (age 65+ years).

Children and adolescents

Children and adolescents form a special group in the context of substance use due to the fact that physiologically they have smaller body volumes, making a small amount of substance exert significant psychoactive effects; and a developing brain, which may be at risk of serious long-lasting adverse effects when exposed to psychoactive substances.

Common psychoactive substances that children may ingest accidentally are prescription pills. Experimental substance use is common in this adolescent groups, substances commonly consumed out of curiosity are tobacco, alcohol, cannabis, volatile solvents and opioids (20). Common signs and symptoms of intoxication in children are presented in table 3. Children and young adolescents may present with intoxication symptoms similar to those seen in adults with much smaller amounts of substances consumed, posing a higher risk of mortality.

While essential principles of treatment are similar to those with adults (21), it is advisable that:

1. Nature of the substance ingested and its dosage per kilo body weight should be identified as accurately as possible.
2. In cases where substance use is suspected, but cannot be confirmed by clinical history, a detailed physical examination, including a full neurological assessment, becomes an important part of substance identification.
3. Administration of emetics, gastric lavage and activated charcoal is generally avoided.
4. Forced diuresis may lead to fluid overload and should be avoided.
5. There is limited evidence for safety and effectiveness of antidotes to specific substances, and the decision to use them depends on risk-benefit analysis.
6. A period of atleast 24 hours for observation after stabilization of the patient is advised.

Table 7: Common features of intoxication in children presenting to emergency

Substance	Clinical presentation in children
Alcohol	Ataxia, nystagmus, shallow breathing, vomiting, altered sensorium, slurring of speech, muscle weakness
Opioids	Nausea, vomiting, altered sensorium, bradycardia, shallow breathing
Volatile solvents	lethargy, impaired movements, blurred vision or double vision (diplopia), slurred speech, tremors, unsteady gait, overactive reflexes, muscle weakness, stupor, or coma

| **Cannabis** | Lethargy, diaphoresis, bradycardia, hypothermia, ataxia, altered sensorium |

For more details, readers are advised to refer to Clinical Practice Guidelines on Children & adolescent presenting with psychiatric emergencies.

Pregnant women

Illicit substances, tobacco, alcohol and prescription drugs are especially harmful during pregnancy due to potential harm to both mother and foetus. Physiological changes in pregnancy often lead to unpredictable variations in the pharmacokinetics of drugs, making most medications and psychoactive substances risky. Despite this knowledge, global prevalence of substance use among pregnant women is about 6%, maximal among young pregnant women (18.3% among pregnant women aged 15–17).

Pregnant women presenting with intoxication present a challenging situation for the emergency department, as both mother and foetus are in need of medical attention, and medications need to be used with great caution.

General considerations for management of an intoxicated pregnant woman in emergency

1. Monitoring of vital signs is essential for both mother (heart rate, pulse, blood pressure, SpO_2, temperature) and foetus (foetal heart rate, non-stress test). In case of signs of foetal distress, refer to specialized treatment services.
2. Reduced foetal movements may indicate foetal sedation and/or hypoxia while increased foetal movements may indicate a fetus experiencing withdrawal symptoms.
3. Pharmacotherapeutic agents should be avoided as far as possible and if prescribed, agents with reliable evidence for safety should be given in the lowest possible effective dose.
4. As intoxication effects wear off, uterine contractions may increase, sometimes precipitating premature rupture of membranes, preterm labour, miscarriage or placental abruption.
5. In cases of overdose with opioids and benzodiazepines, antidotes may be given after careful risk-benefit assessment. Precipitating withdrawals should be avoided as far as possible.
6. After stabilization, it is advised that the woman is referred to specialized treatment services for management of harmful patterns of substance use.

Elderly population

Substance abuse is a growing public health concern among older adults. While alcohol remains the most common substance of intoxication, increasing number of older adults presenting intoxicated to emergency are under the influence of cannabis, opioids and benzodiazepines. For a detailed discussion on management of psychiatric emergencies in geriatric population, readers are advised to refer to Clinical Practice Guidelines on Elderly presenting with psychiatric emergencies.

The elderly population has some unique risk factors for substance intoxication. They have a lower volume of distribution, leading to increased systemic concentration of consumed psychoactive substances. Often, compromised renal function causes reduced elimination of drugs from the systemic circulation. These factors lead to development of intoxication at

relatively lower dosed of the substances. This population tends to have more access to prescription medications with a high risk of dependence. They are likely to present with symptoms that are difficult to differentiate from symptoms of frailty syndrome, such as problems with memory, falls, incontinence, and functional limitations. Older adults who use substances and take multiple prescription medications are also at risk for dangerous pharmacological interactions and adverse effects (22).

A few points to consider while managing elderly patients with substance intoxication in emergency settings are as follows:

1. Aggressive initial treatment is necessary because the elderly patients are generally more susceptible to life threatening complications of drug overdose.
2. A pre-existing physical illness can often confuse the clinical picture. Initial examination should focus on the symptoms and physical findings likely to be attributed to the drug involved while attempts should be made to differentiate the symptom etiology based on temporality and presentation
3. Essential elements of the history include the name and amount of the drug involved, route of exposure, time since exposure, whether the exposure was acute or chronic, symptoms or physical findings, underlying medical or psychiatric illnesses, concurrent medications and any previously administered medical treatment.
4. A laboratory analysis of blood or urine may be helpful in confirming a drug-related problem. Repeated evaluations of drug concentration may be indicated if there is prolonged residence of the substance in the body and also to determine the time course of intoxication.
5. Most patients need symptomatic care for intoxication. When specific antidotes are indicated, these should be given in the same doses as those administered to younger patients.
6. Forced diuresis is risky in patients with congestive heart failure and may lead to fluid overload and pulmonary oedema.
7. Elderly patients with impaired renal function may not respond to urinary alkalinisation to enhance the renal elimination of acidic drugs.
8. Haemodialysis or haemoperfusion may be required at lower plasma drug concentrations in older patients.

Intoxicated patients with dual diagnosis

Dual diagnosis refers to co-occurring substance use disorder and mental health condition. Both disorders are known to share a bi-directional relationship, each increasing the risk of developing the other worsening each other's prognosis. It is a common occurrence for a patient who presents intoxicated to be taking treatment for another mental health condition. It is, in such cases to identify the psychotherapeutic agents that the patient may be taking simultaneously. Common medications are anti-depressants, benzodiazepines, β-blockers and anti-psychotics. These may interact with intoxicating substances to potentiate each other's pharmacodynamic effects (e.g., Stimulants and antidepressants, alcohol and benzodiazepines) or alter each other's pharmacokinetics (e.g., ethanol is a cytochrome P3A4 inducer, and may enhance the metabolism of various psychotherapeutics including Amitriptyline, imipramine, clomipramine, citalopram, escitalopram, paroxetine, fluoxetine, venlafaxine, trazodone, buspirone, nefazodone and

mirtazapine). While isolated incidences of substance use may not be associated with significant harm, it is vital that the patient be informed of the risks and advised as needed on a case to case basis.

References

1. World Health Organization. International statistical classification of diseases and related health problems [Internet]. 10th revision, Fifth edition, 2016. ICD-10. Geneva: World Health Organization; 2015 [cited 2022 Jun 14]. Available from: https://apps.who.int/iris/handle/10665/246208

2. Rezar R, Jung C, Mamandipoor B, Seelmaier C, Felder TK, Lichtenauer M, et al. Management of intoxicated patients – a descriptive outcome analysis of 4,267 ICU patients. BMC Emerg Med. 2022 Dec;22(1):38.

3. Vonghia L, Leggio L, Ferrulli A, Bertini M, Gasbarrini G, Addolorato G. Acute alcohol intoxication. Eur J Intern Med. 2008 Dec;19(8):561–7.

4. Manimaran P, Paul PnG, Jegaraj MA. Alcohol-related acute presentations to the emergency department. Curr Med Issues. 2020;18(4):281.

5. Morgan MY. Acute alcohol toxicity and withdrawal in the emergency room and medical admissions unit. Clin Med. 2015 Oct 5;15(5):486–9.

6. Caputo F, Agabio R, Vignoli T, Patussi V, Fanucchi T, Cimarosti P, et al. Diagnosis and treatment of acute alcohol intoxication and alcohol withdrawal syndrome: position paper of the Italian Society on Alcohol. Intern Emerg Med. 2019 Jan;14(1):143–60.

7. LaHood AJ, Kok SJ. Ethanol Toxicity. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2022 [cited 2022 Jun 25]. Available from: http://www.ncbi.nlm.nih.gov/books/NBK557381/

8. Praharaj SK, Munoli RN, Shenoy S, Udupa ST, Thomas LS. High-dose thiamine strategy in Wernicke–Korsakoff syndrome and related thiamine deficiency conditions associated with alcohol use disorder. Indian J Psychiatry. 2021;63(2):121–6.

9. Alghamdi AM, Samman OY, Bahader WK, Bakhsh TA, Altuwaylib SM, Haider MA, et al. Cannabinoid Acute Intoxication, Diagnosis, and Management. Int J Pharm Res Allied Sci. 2021;10(4):42–6.

10. Schiller EY, Goyal A, Mechanic OJ. Opioid Overdose. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2022 [cited 2022 Jun 24]. Available from: http://www.ncbi.nlm.nih.gov/books/NBK470415/

11. Chen Y, Wang Y, Nielsen S, Kuhn L, Lam T. A systematic review of opioid overdose interventions delivered within emergency departments. Drug Alcohol Depend. 2020 May 23;213:108009.

12. Sordo L, Barrio G, Bravo MJ, Indave BI, Degenhardt L, Wiessing L, et al. Mortality risk during and after opioid substitution treatment: systematic review and meta-analysis of cohort studies. BMJ. 2017 Apr 26;j1550.

13. Bruneau J, Ahamad K, Goyer MÈ, Poulin G, Selby P, Fischer B, et al. Management of opioid use disorders: a national clinical practice guideline. CMAJ Can Med Assoc J. 2018 Mar 5;190(9):E247–57.

14.   Bachhuber MA, Hennessy S, Cunningham CO, Starrels JL. Increasing Benzodiazepine Prescriptions and Overdose Mortality in the United States, 1996–2013. Am J Public Health. 2016 Apr;106(4):686–8.

15.   Webb A, Angus DC, Finfer S, Gattinoni L, Singer Me. Oxford textbook of critical care. 2nd ed. Oxford: Oxford university press; 2016.

16.   Cavanagh JJ, Smith TY. Cocaine Intoxication. In: Nordstrom KD, Wilson MP, editors. Quick Guide to Psychiatric Emergencies: Tools for Behavioral and Toxicological Situations [Internet]. Cham: Springer International Publishing; 2018 [cited 2022 Jun 25]. p. 165–9. Available from: https://doi.org/10.1007/978-3-319-58260-3_30

17.   Cavanagh JJ, Smith TY. Inhalant (Alkyl Nitrites, Nitrous Oxide, Hydrocarbons) Intoxication AKA: Poppers | SpringerLink. In: Quick Guide to Psychiatric Emergencies: Tools for Behavioral and Toxicological Situations [Internet]. Springer International Publishing; 2018 [cited 2022 Jun 25]. p. 183–6. Available from: https://link.springer.com/chapter/10.1007/978-3-319-58260-3_33

18.   Cavanagh JJ, Smith TY. Psychedelic Drug (LSD, PCP, Hallucinogenic Mushrooms) Intoxication. In: Nordstrom KD, Wilson MP, editors. Quick Guide to Psychiatric Emergencies: Tools for Behavioral and Toxicological Situations [Internet]. Cham: Springer International Publishing; 2018 [cited 2022 Jun 25]. p. 199–203. Available from: https://doi.org/10.1007/978-3-319-58260-3_36

19.   Carson HJ. Classes of drugs and their prevalence in multiple drug intoxication in suicides and accidents. Leg Med. 2008 Mar 1;10(2):92–5.

20.   Dhawan A, Pattanayak RD, Chopra A, Tikoo VK, Kumar R. Pattern and profile of children using substances in India: Insights and recommendations. Natl Med J India. 2017 Aug;30(4):224–9.

21.   Riordan M, Rylance G, Berry K. Poisoning in children 1: General management. Arch Dis Child. 2002 Nov 1;87(5):392–6.

22.   Haselberger MB, Kroner BA. Drug Poisoning in Older Patients: Preventative and Management Strategies. Drugs Aging. 1995 Oct;7(4):292–7.

Assessment and Management of patients presenting with psychosocial crisis

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Abstract:

Traumatic and stressful events are common and increasing in the world. Crisis causes acute psychological symptoms in affective, cognitive, and behavioral domains along with individuals' inability to cope using existing coping strategies and psychosocial impairments and/or distress. Crisis interventions (CI) are defined as a set of psychological interventions aimed at ameliorating the psychological consequences of a crisis as well as improving the functioning of the individual. These are short-term, directive, and focused psychological interventions. CIs have a long history and are being used in medicine for a long time in a variety of settings. The concepts, strategies, skill sets, and approaches of CI are evolved from a variety of different psychological disciplines. Currently, an eclectic mixture of strategies is often used for CI. This clinical practice guideline aims at discussing pertinent literature in context with CI and offers interested mental health professionals to understand the science and practical aspects related to CI.

Keywords: Crisis intervention, Crisis, Critical incident, Coping, psychological first aid

Introduction:

Traumatic and crisis inducing events are increasing in the world. The spectrum of crisis events includes both public events that have a significant social impact, such natural catastrophes that affect entire communities, airplane crashes, or terrorist attacks, and private events, including interpersonal domestic violence, suicide attempts, the loss of a loved one, or the start of serious physical or mental illness. A person's life can change dramatically as a result of exposure to a crisis situations and incidents. Crisis situations and natural disasters, which disrupt daily life, can affect every community. A crisis frequently involves adversity, which are defined by a very distressing state of uncertainty, a perceived threat to core beliefs, and disruptions to daily routines. Crisis can be a challenge or an opportunity for efficient problem solving and growth, or it can be a crippling event that results in sudden disequilibrium, unsuccessful coping mechanisms, and dysfunctional behavioral patterns.[1] Crisis are also distinguished in two main ways. A one-time, acute single event crisis or more chronic state of crisis also sometimes called as complex trauma. Terr also used the term type 1 and 2 crisis for the above subtypes respectively.[2]

Crises may have a significant impact on a person's health, functioning, and general well-being. Stress, worry, uncertainty, physical discomfort, and trauma-related mental health issues are typical outcomes. Health effects due to exposure to crisis have been studied extensively, and in recent decades there has been an emphasis on various mental health consequences including post-traumatic stress disorder (PTSD). Several other psychiatric disorder like major depression, anxiety disorders, dissociative disorders, substance use disorders, personality disorders etc. are reported to be having higher prevalence in people exposed to traumatic events of different kind in various phases of the life. However, the disorders specifically related to exposure to crisis, trauma and stress are grouped separately both in ICD-11 and DSM-5. For these disorders, exposure to stressor in necessary for making a diagnosis. The details are given in following table.

Table 1: Disorders related to stress in ICD-11 and DSM-5

ICD-11	DSM-5
Category name- Disorder specifically associated with the stress	**Category name-** Trauma- and Stressor-Related Disorders
Post-traumatic stress disorders	Reactive attachment disorders
Complex Post-traumatic stress disorders	Disinhibited social attachment disorder

Prolonged grief reaction	Post-traumatic stress disorders
Adjustment disorders	Acute stress disorder
Reactive attachment disorders	Adjustment disorders
Disinhibited social attachment disorder	

The crisis interventions have a very long and rich history. The evidence for successful application of psychotherapeutic interventions in military settings were reported since long.[3] The politicians, administrators, other policy makers, at the society and local community level, should better understand psychosocial difficulties and problems encountered after traumatic events exposure for facilitation of service provisions and health force training and supervision.

This clinical practice guideline aims to integrates psychosocial principles of crisis intervention. The model of psychosocial crisis management (PCM) describes how the tasks of crisis managers or crisis intervention workers (CIW) can be guided by principles of psychosocial support. Crisis management insights and psychosocial support principles originated from different several different disciplines and research. Currently integrating strategies from various models helps in formulating better guidelines and strategies.

Several different models of early interventions were tried in forms of disaster mental health programs, crime crisis intervention or community mental health-based crisis intervention for early identification and help of the individuals suffering from the effect crisis. Experts have cautioned, nonetheless, that even if a great desire and willingness to assist is not based on factual and scientific strategies, it may be ineffective or even detrimental to the clients.[4]

Crises are disruptions with a potential psychosocial impact. The psychosocial dimension of crisis management, and can, therefore, strengthen crisis management in general. Crisis often refers to normal stresses and strain. Each crisis has a continuum, from negative to positive, and the resultant outcome depends upon a balance between the two opposing forces. Crisis in the context of current context is defined in specific terms. The following are important terms in context of crisis intervention.

Roberts defines a crisis as "a period of psychological disequilibrium, experienced as a result of a hazardous event or situation that constitutes a significant problem that cannot be

remedied by using familiar coping strategies".[1] An intensely stressful, traumatic, or serious event combined with the person's faulty perception resulting into psychological disruption and the individual's inability to resolve it are the primary factors requiring crisis intervention. Coping mechanisms that could have helped the person cope are either insufficient or not used at all. Later, James and Gilliland define crises as events or situations perceived as intolerably difficult that exceed an individual's available resources and coping mechanisms.[5]

Critical incident is a term which refers to an event which is exceptional and outside the individual's usual range of experience and challenges one's ability to cope successfully. The critical incident has the potential to cause a crisis condition by overwhelming one's usual psychological defenses and coping mechanisms.

Coping behaviours are active efforts to resolve stress and create new solutions to the challenges of the situation. Coping involves the ability to gain and process new information; the ability to maintain control of one's emotional state; and the ability to move freely within one's environment. Coping behaviours are the source of new, original, unique, and creative solutions or behaviours. In this process, one develops adaptive ego functions that provide resources for coping in the subsequent stages or situations. If a crisis is not resolved in a positive manner, it can lead to destructive forces and psychopathology.

Table 2: Components of crisis

Precipitating event- An intensely stressful, traumatic, or serious event; occasionally anticipated aversive situations may bring similar response
Vulnerability- The same crisis event doesn't produce similar effect in all the individuals. Hence a role of inherent vulnerability is there. It can be a personality trait or even context dependent vulnerability in absence of long-standing issues
Perception- Dysfunctional, catastrophic or irrational thinking about causes, impact or consequences of event, and psychosocial conditions
Psychological symptoms- Strong emotions/feelings like vulnerability, anxiety, hopelessness, powerlessness
Poor /faulty coping- One's usual coping mechanisms have failed to bring homeostasis
Functioning impairment or distress

Figure 1: Core conceptualization of crisis

Critical event → Cognition/Perception → Psychological reactions and emotional distress → Dysfucntion
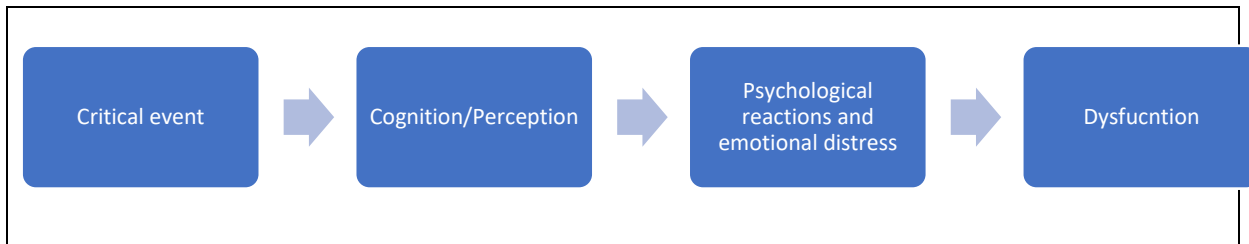
Few examples of crises:

An accident

Natural disaster

Death/loss of a loved one

Onset or deterioration of Physical illness

Financial difficulties

Divorce/separation

Unexpected pregnancy

Employment loss

Table 3: Factors influencing reactions to the crisis

- Nature and severity of the adversity
- Early life experiences
- Age, sex, disabilities (if any), marginalized populations, minorities etc.
- Premorbid physical and mental health
- Available social support and resources to deal with the adversity
- Cultural background and traditions

Table 4: Characteristics of the Crisis Intervention

Time of intervention	Early intervention is recommended
Proximity	Intervention is to be offered in close physical proximity to the acute crisis management
Expectancy	It is expected by the recipient that intervention is focused on

	issues largely related to current crisis
Brief interventions	The interventions are typically brief and focused
Simple	The interventions are often more directive and supportive. Complex interventions are usually avoided at this stage

Table 5: Primary aims of the crisis interventions

The primary aims of the crisis interventions are as follows
1. Establish a rapport and provide reassurance and support
2. Evaluating the nature of the problem and evaluating medical, psychiatric (including suicidal, homicidal, and substance use-related issues), social, and legal needs
3. Ensuring the safety of the client and relevant others
4. Assisting the client in developing an action plan which minimizes distress, encourages successful and healthy coping, and improves functioning. Discussing strategies for successful implementation of these plans
5. Following up with the clients to monitor progress, provide additional support, and necessary referrals or long-term therapy as per the needs and resources available

Figure 2: Core conceptualization of crisis intervention
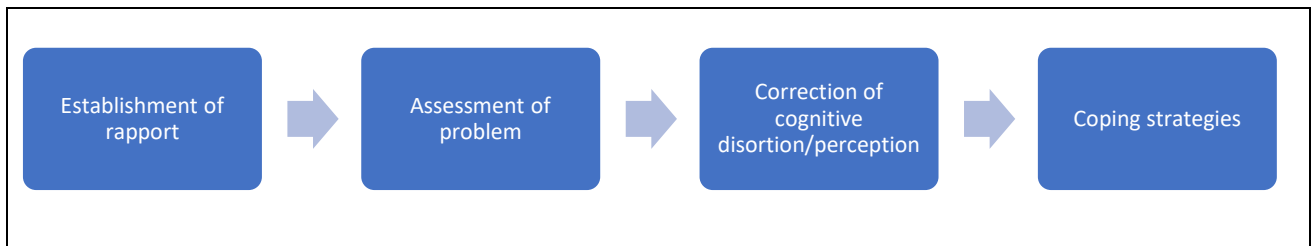
Clinicians need to address the level of distress, impairment, and instability in a rational and methodical way while confronted with a person in crisis.[5] Although, many clinicians may be aware about the best approaches for the crisis intervention, being in stressful situations, they may revert to strategies that are less than effective. Hence, it is important to have a quick and useful reference guide for do's and don'ts for CIWs.

Immediate aftermath of acute crisis event, there are factors that help in long term recovery and prevention of adverse sequalae over a period of time.

Table 6: Factors influencing long term recovery

- Feeling of safety

- Management of emotions- calm, hopeful

- Access to Social Support- Connected to others

- Feeling able to help themselves and community (if relevant)

Several practice models have been developed to help in assessment and intervention during crisis intervention over the years.

Models of Crisis Assessment and Intervention

Models of Assessment:

Triage Assessment System: it was developed by Myer[6], who proposed to assess crisis reactions in three domains:

a) **Affective (emotional) reactions:** include three pairs of emotions anger/hostility, anxiety/fear, and sadness/melancholy. If more than one pair of emotions are present, it is rated as primary, secondary, and tertiary. Accurate assessment of primary emotion provides an opportunity to deal with the feeling and proving appropriate support.

b) **Cognitive (thinking) reactions:** client's perception of how the crisis has affected, is affecting or will affect his or her physical, psychological, social, and moral/spiritual life. The perceptions may include transgression, threat, and loss.

c) **Behavioral (actions) reactions:** include approach/avoidance and immobility. It may be constructive or maladaptive.

Each domain is rated on a scale of 1 (no impairment) to 10 (Severe impairment). The score of all the domains is added together to give an overall severity. The higher is the severity, the more is the impairment.

In addition to this, the client assessment include assessment for suicidality, lethality, risk of harm to others etc. based on the clinical situation. The details of these aspects are not included in this guideline and can be seen at other relevant places.

Models of Management:

1. **Gilliland's Six-Step Model:** it was developed by James & Gilliland[5] and is a useful crisis intervention model. It includes three listening and three action steps.

   i) Listening: focuses on

      a) defining the problem

      b) ensuring client safety

      c) providing support

   ii) Action: focuses on

      a) examining alternatives

      b) making plans

      c) obtaining commitment

A few important components of listening are observing, understanding, empathetically responding, respect for the client, acceptance, non-judgmental attitude, and caring. Action denotes those steps done in a nondirective and collaborative manner. It is also important to assess the needs of the client and the environmental supports available to him.

2. **Seven-Stage Model of Crisis Intervention:** It was developed by Roberts[1] and it contains the following seven stages:

i. **Conducting a thorough biopsychosocial and crisis assessment** (including assessment of suicidal and homicidal risk, need for medical attention, drug, and alcohol use, etc).
The crisis worker should assess the lethality first and confirm whether the client has initiated say for example a suicidal attempt. If not, the crisis worker should assess the client's intent for self-harm. It is recommended to get that information from the client through an artful interviewing style rather than by direct questioning.
ii. **Making psychological contact and establishing rapport.**
A therapeutic relationship with the client can be established through the counselor offered conditions like genuineness, respect, and acceptance of the client. To instill trust and confidence in the client, the crisis worker should practice good eye-to-eye contact, a non-judgmental attitude, creativity, flexibility, a positive attitude, and resilience.

iii. Examining and defining the dimensions of the problem or crisis (including Identification of the precipitant to the crisis).

Crisis workers should focus on the client's current problems, usually, that precipitated the crisis. It will also help to understand how the situation escalated to a crisis and how the client tried to cope with the crisis. This will help the crisis workers to plan and suggest necessary modifications to the client to resolve the current crisis and prevent future crises.

iv. Exploration of feelings and emotions mainly by actively listening and responding with encouraging statements.

The crisis workers should allow the client to vent his or her distress/feelings. Active listening skills like paraphrasing, reflecting feelings, and probing are useful in this stage. In this stage, the crisis workers should work challenging responses (providing information, reframing, and interpretation) into the crisis-counseling dialogue that may help to undo the client's maladaptive beliefs.

v. Exploration of past positive coping strategies of client and alternatives if any.

Crisis workers need to be creative and flexible in resolving crises. The crisis worker and client can discuss the available options on the table (e.g., a no-suicide contract) for ensuring the client's safety. Some authors recommended integrating Solution-focused therapy techniques viz., "Amplifying Solution Talk" in this stage.

vi. Implementation of the action plan. It is important to identify supportive individuals and contact referral sources

The action plans (e.g., entering a 12- step treatment program, joining a support group, etc.) implemented at this stage are important for restoring the client's equilibrium and psychological balance. Roberts highlighted the importance of the cognitive dimension of the client at this stage that will help to gain mastery over the crisis and to cope with similar situations in the future.[1]

vii. Follow-up plan with clients to ensure that the crisis has been resolved

Also, the post-crisis evaluation of the client is to be done that may include the client's physical condition, overall functioning, cognitive mastery of the precipitating event, the progress of the treatment, and need for any referral (e.g., legal, medical, etc.). In this stage, it is recommended to have a "booster session" with the client (usually after a month of termination of the crisis) to assess treatment gains and potential problems.

Location:

Location of crisis intervention strategies is dependent on the crisis intervention program, target population, and available resources. CI is offered in clinical settings, makeshift offices in disaster sites, military settings, workplace, schools, in community outreach centres or at homes. Additional factors influencing location might be local norms, culture, stigma of mental health and administrative support etc.

Management:

Pharmacological treatment

The choice of treatment is determined by several factors. Availability of treatment options, time, and resources available, choice of treatment by the patient are some of the important considerations. Although, psychological interventions remain the treatment of choice, unavailability of therapist, unwillingness, or inability of the clients to undertake psychological interventions are important reasons for choosing pharmacological treatment options. In practice, most patients with sufficiently severe psychopathology receive a combination of pharmacological and non-pharmacological interventions. The pharmacological treatment options available have following important caveats that all medications have some potential for adverse reactions and the empirical base for effectiveness of pharmacological treatment options is limited.[7] Hence, the treatment approach remains symptom based and empirical. SSRIs are considered the first line agents. However, SDAs, Mood stabilizers, sedative/hypnotics and antihypertensives are commonly used for the management of symptoms. Best practice prescribing strategies are followed for drug treatment. It primarily includes information prior to commencement, regular monitoring of response, adverse effects, and suicidal risk. Minimum number of medications are used, and polypharmacy is avoided as far as possible. Appropriate discontinuation and withdrawal practices are followed.

Table 7:Commonly used medications for psychiatric conditions related to stress

SSRIs	SSRIs are considered first line medications for such conditions. There is insufficient evidence to compare relative effectiveness of agents among each other's. Paroxetine, sertraline, and escitalopram are commonly used.

Other antidepressants	Mirtazapine and amitriptyline are other commonly used medications. Trazodone may be used as a medication to promote sleep.
SDA	Olanzapine, risperidone, and quetiapine have been used for irritability, anger, severe agitation, and uncooperativeness.
Mood stabilizers	Lithium carbonate, Valproate, Carbamazepine/ Oxcarbazepine. Usual indications include violent behavior and irritability.
Sedative/hypnotics	Benzodiazepines and Non-Benzodiazepine medications can be used for insomnia, anxiety, and agitation. Lowest dose for shortest period should be used. Client should be informed about potential for dependence.
Propranolol	Propranolol can be used for increased arousal, palpitation, and anxiety.

Psychological interventions

The crisis intervention strategies are offered in various settings including outpatient psychiatric clinics, community mental health centers, counseling centers, or crisis intervention settings.

Crisis theory is developed over a period of time using inputs from a variety of disciplines and schools of thought. The commonly used crisis intervention models nowadays are often eclectic mixtures of psychoanalytic, existential, humanistic, cognitive-behavioral, and family system theories.[8]

Crisis interventions (CI) are problem-focused, brief mental health interventions that are typically used within 4 to 6 weeks of exposure to a stressor or crisis. It is one of the most commonly used time-limited treatment modalities in the world.[9] This clinical practice guidelines outlines broader model and approaches useful in crisis situations. The CIW can adapt it appropriately according to the local cultural and contextual issues.

The mental health needs of the people exposed to a significant stressor or crisis are different and distinctive. Several different models of interventions are available. This article doesn't aim to comprehensively elaborate and enlist all the available models. Although each situation and client's needs are different, a few common steps can be applied across the situations. It is aimed to discuss common components of these models and essential strategies found successful across different models.

CI can be offered in multiple settings to a variety of individuals or groups including primary and secondary victims. The deceased, the injured, and their family and friends are examples of primary victims because they were directly involved in the critical event. The term "secondary victims" refers to anyone who are somehow witnesses to the immediate traumatic consequences on the initial victims, such as eyewitnesses, rescuers, and converging rescuers. Accordingly, the strategies can be for individual or group settings. A broad range of possible crisis and individual reactions, the severity of distress, and the use of coping strategies call for a reasonable individualization in approaches for every situation. A variety of professionals can conduct crisis intervention (CI). A psychiatrist, a clinical psychologist, psychiatric social worker, or psychiatric nurse can learn to use these skills and can conduct successful CI. For this document, for the brevity of writing, any professional conducting CI is referred to as Crisis Intervention Worker (CIW).

The important steps of crisis intervention are discussed below.
Establishing a rapport:
There are certain general strategies for establishing and strengthening rapport with the client. Many clients have limited attention span, feel distracted, have difficulty at focusing, or are extremely anxious owning to emotional upheaval after experiencing a psychosocial crisis. The CIW should be vigilant about these issues and make appropriate alterations in the interview style for the same. Initial success in CI is largely dependent on the CIW's ability to put the client at ease and alleviate these emotional reactions. Asking small questions, and frequently checking if the client can understand and appreciate what is being said is important.

At the beginning of the interview, CIW has to introduce himself/herself and need to inform the reasons for speaking to the client. Unless the reason for the consultation is implicit (the

client himself/herself has come to the CIW), CIW should take consent for further proceeding. The CIW should also inform about the nature of the interview and the approximate amount of time needed. The client is informed that they are free to make suggestions regarding the intervention format and they will not be pushed to talk or cooperate against their wishes.

The information regarding privacy and confidentiality is also provided to the client. The information is shared with others only if there is a serious concern related to the safety and security of the client or relevant others (e.g., suicidal or homicidal intent).

A respectful, non-judgmental, and considerate environment is created during the interaction. Clients are often going through considerable distress, emotional pain, and feeling vulnerable and uncertain about several things. It must be acknowledged, and due consideration is given during the interaction. This respectful and considerate environment significantly contributes to the development of rapport.

Few key clinical skills are discussed in this regard

I. Active listening- The most basic yet most important skill in psychological therapeutic interventions remains active listening. Active listening is paying attention to the verbal and non-verbal speech of the client and ongoing reactions to it so that clients know that they are being heard and understood. The components of active listening include adequate eye contact, attentive and encouraging body language like appropriate head nodding, slight leaning towards the client while talking, appropriate facial/hand gestures, and vocal style showing concern.

II. Questioning techniques- A combination of open-ended and closed-ended questions is used during the interview. As usual, it is better to start with open-ended questions and gather information. Close needed questions are useful in completing important areas which are missed like the further elaboration of the information provided till now and evaluating the risk of suicide/homicide or other risky behaviors. Certain interviewing techniques are also useful.

1. Clarifying: It aims at clearly understanding what is being said. The CIW may ask questions to clarify and to also show that he/she is actively listening.

2. Paraphrasing: CIW restates what clients have already spoken in simpler words emphasizing factual and cognitive aspects.

3. Summarizing: Summarizing is used to bring focus to the most important aspects of CIW's understanding. Feedback is taken from the client so that both mutually agree on the extent of the problems and difficulties.

4. Reflection: Reflection is a statement that emphasizes the affective or emotional part of verbal or nonverbal speech of the client e.g., *sounds like you are angry with your boss, you seem to undergo humiliation while living with xxx*. Reflection is a powerful technique to express empathy. Expressing empathy means letting the client know that CIW understands the emotions and feelings being experienced by the client.

5. Matching and mirroring nonverbal communication: Consciously matching and mirroring the postures, gestures and facial expressions in subtle way improves rapport and communication.

It is also important to note that CIW should avoid confrontation, getting into debates and argument with the client. It should be accepted that every client's situation, needs and context are different and 'clients' are expert in their situation. Whenever appropriate, taking 'one-down position' to client is useful to foster better therapeutic relationship in many situations.

Evaluating the problem:

CIW needs to evaluate several aspects of the crisis. The areas of inquiry include precipitating event, client's perceptions of meaning and reasons of the event, amount of subjective distress, and identifying different emotions being experienced by the client, as well as functioning in various areas of life like personal, familial, social, academic, and occupational, etc. The client's level of comfort and amount of distress is monitored while talking about the event. It is important to know that the clinician does not have to know everything about client's difficulty and the goals in order to successfully provide crisis intervention effectively. Exact and minute details of the event are *not* important and even maybe counterproductive to ask.

Therapeutic strategies:

Assessment of the client's perception is one of the most important tasks in CI. This aspect is often the most important target for intervention in CI. It is the perception of the client and his/her ability to cope with the event that led to the current problem. Once the cognitions, perceptions, meaning of the event, and frame of reference regarding various aspects of the

event are assessed, CIW aims at addressing them to identify the thinking errors made by clients and alter these cognitions into more adaptable and helpful cognitions. This strategy of cognitive restructuring is an essential aspect of CI. Once this has been achieved, it leads to a reduction of the accompanying emotional distress. Usually, the dysfunction and distress originate from the following areas.

a) Loss of control

b) Loss of self-esteem

c) Loss of support

d) Difficulty in adjustment to change in life or a role

The subjective distress and functioning levels of the client need to be independently assessed. It is helpful for the client if they can ventilate their difficult emotions, distressing feelings, and other associated behavioral and somatic symptoms. Functioning should be assessed in each area as improving functioning early during the treatment process is an important goal of therapy.

Identifying and evaluating medical, psychiatric (including suicidal, homicidal, and substance use-related issues), social, and legal needs are other important tasks. These needs may be contributing to the effective application of healthy coping strategies. Appropriate referrals must be made once a client needs help in an important area that falls outside the expertise area of CIW.

Solution focused approach- The emphasis is on finding solutions rather than solving problems. The therapeutic skills are asking questions that achieve solutions through "solution talk or change talk" in comparison to "problem talk". It is assessed that what has not worked till now. It is conveyed to the client that there are several approaches to feel better and improve in the current context. Emphasis is placed on the setting goals for future. It is important that goals are set by the client themselves and these are SMART (specific, measurable, achievable, realistic and time limited) as far as possible. Goals should be stated in positive rather than negatives i.e. rather than '*I want to stop feeling depressed*' or '*I don't want to keep laying all the day*' it can be '*I want to feel peaceful and safe*' and '*I want to start visiting markets and shops for my daily needs*.'

During next part of the intervention, a few other strategies are also used as therapeutic interaction in CI.

I. Education: It is important to educate the clients about the universalities of crisis in human life as well as perceptions and emotional reactions of other people who have experienced similar events e.g. Although unfortunate, about 30% of women have experienced intimate partner violence in marriage. It is common to experience sadness, anger, and helplessness during this time. However, there is a lot that can be done to improve the present situation and future risk of violence by your spouse. This educational information may lead to a reduction in the feeling of loneliness as well as empower the clients to take appropriate action. Many clients suffer due to a lack of reliable information and a tendency to unreasonably blame themselves. Educational statements may include information related to statistics, frequency, psychological impact, social perspective as well as scientific understanding of the issues related to crisis events.

II. Empowerment: The process of becoming stronger and more confident, especially in controlling one's life and claiming one's rights. These statements are offered as a part of enabling the application of appropriate coping skills and healthy behaviors as part of recovery. Many clients believe that they have failed in anticipating or stopping the event hence they are unable to do so in the future also. They may also blame themselves or consider themselves weak, wrongful, or wicked. It is important to bring change in this perspective. Clients are presented with various choices and strategies to respond better presently. CIW who offer advice to and generate solution may sometimes quicken the crisis resolution however, it may not lead to client empowerment. Concept of empowerment is helpful in improving resilience hence is helpful for current crisis as well as enable clients to deal with similar situations in future more effectively.

III. Validation: Validation is defined as recognition or affirmation that a person or their feelings or opinions are valid or worthwhile. During the treatment process, CIW reassures and supports the clients often that the emotional experiences and distress experienced are normal after experiencing such a crisis and it will get better. The aim is also to encourage adaptive and helpful coping strategies for the clients. However, the validation and support statements are not the ones that may be perceived as false or empty. The clients often listen from well-meaning friends and family members that "Don't worry," "Everything will be okay," and "You are strong and get through this." CIWs are experts in dealing with such situations hence validation and support come from a deeper understanding of the client's unique difficulties as well as a scientific understanding of the recovery process.

IV. Reframe: The clients often have cognitive errors and may have a wrong frame of reference while interpreting crisis events. The clients are encouraged to adopt a realistic frame of reference.

Coping:

At the end of the CI, CIW should aim to summarize the formulation of the client's problem from the medical point of view, address cognitive re-structuring related to events and discussions focus on successful coping strategies.

As the rapport with the client is established, the client starts becoming more comfortable due to a reduction in distress levels; he/she is encouraged to take a more active part during the interaction. The client is encouraged to enlist what they have been trying to do to cope with the event till now. CIWs should focus on identifying and working with the client's strengths. Emphasizing strengths rather than deficits can help in facilitating better engagement and success of intervention. Earlier research has found that clients want therapist to think positive about them. Making hostile, rejecting, critical or blaming comments elicit negative reactions towards therapy and therapist. The impact of coping strategies used so far is jointly evaluated. It is attempted to distinguish healthy/adaptive coping strategies from unhealthy/maladaptive coping strategies.

The client is asked to suggest a list of healthy/adaptive coping strategies that they can use in the present and future to deal with the undergoing crisis. Once the client has exhausted their ideas about coping strategies, the CIW can also suggest some of the coping strategies which the client is not able to think of or is unaware of so that it can be discussed if these are practical strategies and can be of use to the client. Joint decision-making is encouraged at this stage. However, if the client is not able to focus, unable to come up with possible coping strategies, or is indecisive regarding the practical utility of the strategy, they may be encouraged to try the technique and discuss its impact with the CIW. Possible hurdles to the implementation of the strategies discussed are also inquired about. Once the list of hurdles e.g. *not having the motivation to go for a walk, feeling fatigued at the end of the day so that could not engage in my favorite hobby, not having the courage to make a call to my old friends as I have not connected with them for quite some time*, etc. have been gathered, both CIW and clients can jointly find out the plan to handle important issues. This activity significantly increases the chances of successful implantation of the discussion that happened in the session.

Table 8: Few examples of coping strategies which can be useful after facing a crisis

Problem focused coping strategies	Emotion focused coping strategies
Behavioral strategies employed to actively handle distressing situations. E.g., Collecting information, decision making, conflict resolution, acquisition of knowledge, skills or abilities	This involves reappraisal of situations differently, handling emotions and learning and utilizing activities for managing somatic manifestations and neurovegetative functioning e.g., Journaling, meditation, relaxation exercises, cognitive reappraisal

Some other approaches found useful

I. Support groups: The client may be encouraged to get in touch with local support groups. It might be more comfortable for the clients to receive support from a natural support group like peer groups, relatives, friends, religious groups, or co-workers if any such possibility is available to the client. There can be few organized peer support groups in certain parts of the country. The client is encouraged to try seeking the help of such groups.

II. Journaling: Clients may find it helpful to keep a journal. CIW may encourage clients to maintain a secret/personal journal. Writing once thoughts, emotions and other experiences allows the person to evaluate these more objectively. This is helpful in the recovery process for several individuals.

III. Bibliography: There are several good books/websites/reading materials available for dealing with different kinds of crises. Advising quality reading material to interested clients is often helpful to people who like to read. Such resources are often developed both by experts and first-person accounts of persons who have gone through a similar crisis are available. Keeping a list of such resources and advising capable clients to use is helpful in several instances.

IV. Medical and legal referrals: Many clients may require medical and legal referrals but may be avoiding the same due to several reasons. The CIW can direct them to seek appropriate referrals and can help in making some provisions in this regard with any other helping agency, if available.

There are several specific models for crisis intervention that are developed over a period of time for different situations. A few of the important models are summarized below.

Psychological First Aid (PFA):[10] PFA is defined as a "humane, supportive response to a fellow human being who is suffering and who may need support." PFA is aimed offered to the people who have immediately experienced extremely stressful events. This model of care takes into account both psychological and social aspects of care needed for persons during the early course of exposure to stressors. Special attention is given to focusing on the preservation of the dignity, culture, or abilities of the person to whom the intervention is being offered. The evidence of PFA has been compared with psychological debriefing and it was found that PFA is superior to psychological debriefing in crises. The strategies of PFA have evidence of saucerful application in low and middle-income countries also and these can be offered even by non-professional people also. PFA can be used by non-professionals and professional both. Booklet of PFA is available for free download from https://www.who.int/publications/i/item/9789241548205 (Last accessed 22 June, 2022).

Critical Incident Stress Management (CISM):[11]

CISM is evolved from earlier CI programs and group psychological debriefing techniques. CISM was originally developed for emergency service personals like fire department, first line police, rescue or disaster teams and military settings. It is defined as an integrated, multicomponent, comprehensive intervention program useful for both the primary and secondary victims. The strategies are included for pre-crisis preparation, acute crisis intervention, and post-crisis management. Both individual and group strategies are incorporated usually lasting from 4-12 sessions. Pre-crisis preparation may be thought of as a form of 'psychological immunization'. The aim of this phase is to strengthen potential psychological vulnerabilities and enhance resilience in individuals specifically who are at risk of developing crisis reactions. It includes providing information so as to have realistic expectations about the stress responses. It also incorporates stress response management, behavioral regulation, improved coping and practical strategies to help and support each other for people involved.

Conclusion:

Crises are common human experiences and a subset of vulnerable people develop clinically significant difficulties necessitating intervention. Evidence-based clinical interventions are available that can be offered to persons in need. Typically, therapeutic interventions needed

for crises are offered as early as possible, is problem focussed, simple and brief. Therapeutic strategies used in crises are often derived from an eclectic mix of strategies from various psychological intervention models. The major clinical issues are assessed in domains of cognitive, emotional, and behavioral domains. Interventions are focussed on handling psychological reactions as well as providing help, information, and support regarding social issues, if feasible.

Reference:

1. Roberts AR, editor. Crisis intervention handbook: Assessment, treatment, and research. Oxford university press; 2005 Jul 14.
2. Terr, L. (1990). *Too scared to cry.* New York: HarperCollins.
3. Artiss KL. Human behavior under stress—from combat to social psychiatry. Military Medicine 1963;128(10):1011-5.
4. Kaul R E & Welzant V. Disaster mental health: A discussion of best practices as applied after the Pentagon attack. In Roberts A R, editor. Crisis intervention handbook: Assessment, treatment and research, 3rd ed. New York: Oxford University Press; 2005. p. 200–220
5. James RK, Gilliland BE, editors. Crisis intervention strategies. Cengage Learning; 2016 Jan 27.
6. Myer RA, editor. Assessment for crisis intervention: A triage assessment model. Pacific Grove, CA: Brooks/Cole; 2001
7. Forbes D, Creamer M, Phelps A, Bryant R, McFarlane A, Devilly GJ, Matthews L, Raphael B, Doran C, Merlin T, Newton S. Australian guidelines for the treatment of adults with acute stress disorder and post-traumatic stress disorder. Australian & New Zealand Journal of Psychiatry 2007;41(8):637-48.
8. Roberts AR, Everly Jr GS. A meta-analysis of 36 crisis intervention studies. Brief Treatment and Crisis Intervention 2006;6(1):10.
9. Greenstone JL, Leviton SC, editors. Elements of crisis intervention: Crises and how to respond to them. Pacific Grove, CA: Brooks/Cole. 2002
10. World Health Organization. Psychological first aid: Guide for field workers. World Health Organization; 2011.
11. Everly Jr GS, Flannery Jr RB, Mitchell JT. Critical incident stress management (CISM): A review of the literature. Aggression and violent behavior 2000;1;5(1):23-40.

Clinical Practice Guidelines for assessment and management of patients with Borderline Personality Disorder (Indian Psychiatric Society)

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The main message

- Borderline personality disorder (BPD) is a severe disorder that significantly impairs the patient's ability to function and places a heavy burden on the health care system.

- The prevalence of the disorder in the population is estimated at 0.7%.

- The three main symptom clusters of BPD are emotional instability, behavioural dysregulation and susceptibility to problems in interpersonal relationships.

- BPD is associated with many psychiatric and medical comorbidities and a significant risk of suicide.

- Various self-harming behaviours are common in the disorder, which is why crisis management is central to treatment planning.

- Certain psychotherapy methods can effectively alleviate the patient's symptoms and distress, promote adaptation and improve functional capacity.

- Antipsychotics may alleviate the symptoms of several dimensions. Mood stabilisers can be useful in reducing impulsivity and aggression. Serotonin reuptake inhibitors can be useful in the treatment of multiple dimensions. Drug treatment involves the risk of polypharmacy.

- Mood stabilisers and second-generation antipsychotics are now preferred for drug treatment.

- The treatment should be carried out as far as possible in an outpatient setting, and in case of hospital treatment, mainly in a day hospital setting. Patient preparation for crisis situations is the cornerstone of treatment. The need for rehabilitation should be considered while monitoring psychiatric treatment.

- The coordination of the patient's overall care is facilitated by the designation of a responsible person or clinical team, and the implementation of good care requires the establishment of expert clinical teams.

- The prognosis of BPD is quite good because, after more than five years, fewer than half of the patients meet the criteria for the diagnosis. In most cases, the patient's ability to function recovers and depressive symptoms are alleviated with treatment.

Introduction

Delimitation of the topic and target group

This guideline uses the 5th edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) diagnosis of "borderline personality disorder" (1). The guideline is intended to be applied to specialised psychiatric and general/ primary health care settings.

Personality disorders in the current classificatory systems

Research on personality disorders (PD) has progressed significantly. Classificatory descriptions of PD have been changing from categorical to more acceptable dimensional ones. However, for this guideline, we have followed DSM-5, as most of the existing good quality evidence is based on DSM-5 or DSM-IV-TR criteria. **Present-day scientific research primarily emphasises the BPD categorical diagnosis, and so does this guideline.** ICD-10 Emotionally unstable PD: borderline type is similar to the DSM-5 borderline PD diagnosis (table 1) (1,2). ICD-11 and DSM-5 describe personality disorders differently: in ICD-11, the equivalent to 'borderline personality disorder,' would be the diagnosis of personality disorder (usually moderate, or severe) with a specifier, 'borderline pattern.'

>> Insert Table 1 here<<

Basic concepts

Personality and temperament

The term "Personality" encompasses a dynamic set of functions and traits. Personality can be described on four levels:

- Personality traits (e.g., temperament, panel 1)
- Characteristic means of adaptation and individual goals
- Narrative self (e.g., identity)
- Dynamics of interaction relationships

"Temperament" refers to individual, biologically-based skills in regulating emotions that can be recognised already in infancy. DSM-5 defines personality traits as persistent ways of perceiving, relating to others, and understanding oneself and the environment (1). Among the personality traits, (i) emotional stability, (ii) conscientiousness, and (iii) social dominance continue to increase until the age of 30–40 years (3,4). Traits of healthy and disturbed personalities seem to form a continuum.

>>Insert Panel 1 here<<

Personality disorder

Borderline personality disorder (BPD) is associated with a limited, rigid or unstable experience of the established self and self-concept, as well as difficulties in interpersonal relationships. Accentuated negative emotionality is a hallmark of borderline personality, but the condition is also associated with acute symptoms (1,5).

When managing BPD it is important to remember that the diagnostic criteria for borderline personality describe a heterogeneous group of patients (6). And also, that the disease burden of the PD patients is comparable to severe physical diseases (7).

Epidemiology

Global prevalence

PD have been found at varying rates all over the world. The prevalence of PD (as per DSM-5) in the general population is about 6%. Of these, cluster-B PD, which include borderline, antisocial, histrionic, and narcissistic PD, have an overall global prevalence of 1.5% (8). PD are clearly more common in young adulthood than later (10). In high-quality European population studies, the prevalence of borderline personality was reported to be 0.7% (11). According to estimates, borderline personality disorders (BPD) occurs in 6% of primary care patients, but the proportion of identified cases is probably much lower (12,13). Western studies suggest that almost 60% of people with BPD may be in contact with primary healthcare services during the year, usually due to somatic symptoms and illnesses. The prevalence is relatively higher among young adults, women, and people with little education and low income (14). There is no research evidence of an increase in prevalence of BPD.

Indian prevalence

Systemic studies from India and other developing countries assessing the prevalence of PD are lacking. Early studies (from the late 1980s) had reported the prevalence of PD in the general population ranging from 0 to 2.8%, with a weighted mean prevalence of 0.6%. Male gender was significantly associated with PD (15). Most of the epidemiological studies conducted in India have systematically underreported the prevalence because of sampling bias and other methodological flaws. The prevalence of PD among treatment-seeking Indian populations (0.3-1.6%) is lower than that of western data (25-50%). However, it is likely that

this difference is due to under-recognition (15). A retrospective chart review (1996–2006) among North Indian patients seeking treatment in psychiatric outpatient settings reported a prevalence of 1.07% for ICD-10 PDs. The most common PD documented in the study were anxious-avoidant and borderline (16). The reported rates are higher in special populations such as individuals in conflict with the law (7.3-33.3%), individuals with substance use disorder(s) (20-55%) and those who had ever attempted suicide (47.8-62.2%) (15). A recent study on patients (N=100) visiting the emergency department of a private hospital in eastern India using translated scales to screen for ICD-10 diagnosis of PDs found 24% of participants met the cut-off criterion (17).

Risk factors

Childhood antecedents

BPD is thought to arise either from the interaction of predisposing factors or from the worsening of a childhood or adolescent psychiatric disorder. According to the so-called **exposure model**, BPD is the result of interaction between predisposing factors. According to the so-called **complication model**, it is primarily the result of another psychiatric disorder. Support for both models has been found in longitudinal research, because the age of onset and gender seem to lead to different developmental curves (10). In girls, internalizing symptoms in early adolescence, such as anxiety and depression, may predict BPD in late adolescence (complication model); while externalizing symptoms, such as defiance and conduct symptoms in adolescence may predict BPD in adulthood (exposure model) (18,19).

Predisposing factors

Factors that increase the risk of a BPD are also associated with other psychiatric disorders and physical illnesses. The accumulation of several factors suggests a higher probability of a disorder. Hereditary factors are known to be associated with personality traits and BPD (20). In some patients, the emergence of the disorder may be related to organic and neurocognitive factors, such as encephalitis (inflammation), epilepsy, learning disorders and childhood attention deficit hyperactivity disorder. Risk factors during pregnancy, such as maternal smoking and medical complications, as well as complications during childbirth seem to increase the risk of BPD (21). Those suffering from a BPD, report more difficult, traumatic childhood experiences than healthy controls (22). Anxiety sensitivity and aggressiveness or

4

hostility related to the temperament trait of negative emotionality, as well as severe emotional abuse are independently associated with the risk and severity of BPD. Heightened rejection sensitivity may be related to emotional neglect (23,24). **Sexual abuse as a single factor apparently increases the risk of BPD little or not at all (25).** There is conflicting evidence about the association between dissociation symptoms and traumatic anamnesis in BPD. Dissociation can manifest as forgetfulness, a feeling that the self (depersonalization) or the world (derealization) has become alien, or as short-term hallucinations. BPD is significantly but weakly related to accumulating parenting problems. Parent's mental disorder and lower socioeconomic status may be background factors for abuse and emotional neglect. Prolonged separations from parents in the pre-school years are linked to symptoms of BPD in the adulthood (24).

Abnormalities of brain function have been observed in neurophysiological studies (EEG and arousal response studies) (26). BPD is associated with disruption of the functioning of the serotonin system in the fronto-limbic areas of the brain (27). Brain changes that occur in patients with BPD, such as a decrease in the volume of the hippocampus and amygdala, are possibly related to childhood maltreatment, the severity of the disorder, and comorbidity (28).

Primary prevention

There has been no research on the primary prevention of BPD. A BPD exposes children to problems in parenting; so, good treatment of the disorder is likely to be promoted by good parenting. Parental guidance has a positive effect on the parenting patterns of at-risk families and children's behaviour problems. A wide-ranging program including nutrition, education and exercise implemented in kindergartens may reduce disruptive behaviour and psychotic symptoms in young adulthood. Parental guidance reduces behavioural disorders in children and may reduce the costs caused by the continuation of behavioural disorders later (29).

Clinical features

Core features of BPD

The core features of BPD are marked affective dysregulation, marked disturbances in self-image, unpredictable interpersonal relationships, and marked impulsivity. A model by Sanislow et al., 2022 (30), summarised the features of BPD into the following three dimensions:

Kommentar [33]: Martín-Blanco A, Soler J, Villalta L, Feliu-Soler A, Elices M, Pérez V, et al. Exploring the interaction between childhood maltreatment and temperamental traits on the severity of borderline personality disorder. Compr Psychiatry. 2014;55(2):311–8.

Steele KR, Townsend ML, Grenyer BFS. Parenting and personality disorder: An overview and meta-synthesis of systematic reviews. PLoS One. 2019;14(10):e0223038.

Kommentar [34]: Porter C, Palmier-Claus J, Branitsky A, Mansell W, Warwick H, Varese F. Childhood adversity and borderline personality disorder: a meta-analysis. Acta Psychiatr Scand. 2020;141(1):6–20.

Kommentar [35]: Boutros NN, Torello M, McGlashan TH. Electrophysiological aberrations in borderline personality disorder: state of the evidence. J Neuropsychiatry Clin Neurosci. 2003;15(2):145–54.

Kommentar [36]: Hutchings J, Gardner F, Bywater T, Daley D, Whitaker C, Jones K, et al. Parenting intervention in Sure Start services for children at risk of developing conduct disorder: pragmatic randomised controlled trial. BMJ. 2007;334(7595):678.

Kommentar [37]: Sanislow CA, Grilo CM, McGlashan TH. Factor analysis of the DSM-III-R borderline personality disorder criteria in psychiatric inpatients. Am J Psychiatry. 2000;157(10):1629-1633. doi:10.1176/appi.ajp.157.10.1629

a) Impaired relatedness – Chronic emptiness, unstable relationships with others, identity disturbance

b) Affective dysregulation – Affective lability, excessive anger, and violent efforts to avoid abandonment

c) Behaviour dysregulation – Impulsivity, suicidality, and self-injurious behaviour

Affective instability was shown to be the most sensitive and specific single manifestation of BPD in a sizeable psychiatric OPD sample evaluated using a semi-structured interview (31). All symptoms of BPD are associated with psychosocial impairment and poor quality of life. Chronic feeling of emptiness was found to be associated with the highest morbidity, including suicidality.

Other important presenting features of BPD

Suicidality

Suicidal threats, gestures, and attempts are common manifestations of BPD. Data on rates of suicidal ideas, attempts and suicide deaths have varied markedly. In retrospective studies, the rate of death by suicide is between 8-12% among individuals with BPD (32). Years of suicide threats and self-injurious behaviour may precede a completed suicide, and therefore predicting a suicide outcome may be difficult. All reported suicide ideations or attempts should be taken seriously in patients with BPD. Suicide risk assessment is described later. Chronic feeling of emptiness, impulsivity, negative affectivity, and poor psychosocial function are commonly replicated chronic risk factors of suicide. More acute risk factors for suicide attempt in BPD include recent depressive episode, substance intoxication, adverse life event and recent loss (33).

Interpersonal difficulties

Patients with BPD usually have volatile relationships, especially with persons in close association (34). A phenomenon called "splitting" often characterises the stormy relationship patterns where a support person (friend or romantic partner) is viewed as "all good", loving and ideal when the patients' needs are met, and at other times the same support person may be viewed as "all bad", mean or cruel. A feeling of abandonment drives the behaviour of anger, clingy demands, depressed mood, hopelessness and suicidal thoughts and acts when the support person leaves (or is unable to meet the patient's needs), even if for a short period. This alternating pattern of view may shift very rapidly, often with episodes of crisis in between. Patients with BPD often interpret neutral events, words, or faces as "negative".

Thus, the patient is prone to misinterpret relatively minor disagreements or adverse events as a sign that the caretaker or the therapist wants to terminate the relationship. This inclination to "split" can impact the relationship with the therapist and the treatment outcome.

Affective instability

Rapid and distressing intense changes in the affective state is a common presenting complaint in BPD. Changes in the emotional states can vary between happiness, intense anger, anxiety, panic attacks, dysphoria, sadness, and crying spells with interposing periods of euthymia. These mood shifts can happen within the span of a few hours and are frequently cued by environmental stress (e.g., fear of abandonment). However, affective dysregulation in BPD can also happen without any identifiable external factor. All efforts should be made not to miss a comorbid cyclothymia or more severe mood disorder.

Impulsivity

Impulsive and potentially self-damaging behaviour are common in BPD with minimal regard for possible negative consequences. Impulsivity can manifest in many forms – substance abuse, binge eating, engaging in unsafe sex, spending money irresponsibly, involvement in physical fights and reckless driving. The loss of control in sudden decisions or acts may manifest in damaging ways, e.g., suddenly quitting a job that the person needs or ending a relationship that has the potential to last, thereby sabotaging their own success. Impulsivity can also manifest with immature and regressive behaviour and often takes the form of sexually acting out. Although the patient may regret their behaviour afterwards and may even appreciate its potential dangerousness, they may find it difficult, if not impossible, to resist the urge to repeat the behaviour. From a management perspective, impulsivity should be manifested in at least two areas of life to be clinically significant.

Deficits in the cognitive functioning

Neuropsychologic functioning in patients with BPD is impaired in many domains. BPD patients perform significantly worse on tests of – attention, cognitive flexibility, learning and memory, planning, processing speed, and visuospatial ability (35).

> **Kommentar [311]:** Ruocco AC. The neuropsychology of borderline personality disorder: a meta-analysis and review. Psychiatry Res. 2005;137(3):191-202. doi:10.1016/j.psychres.2005.07.004

Non-suicidal self-injury (NSSI)

Patients with BPD may hurt themselves. Patients may typically recognise the activity as a compulsive act to calm down "inner tension," It helps them to relieve stress and avoid suicidal thoughts or behaviours. NSSI is often associated with acute substance intoxication

Presentation of BPD in different age groups

Adolescence

Although features of personality disorder in adolescence usually ameliorate with age, severe PD symptoms in adolescence seem to predict adult PD. Features of PD can be observed in some cases as early as 6 years of age, when they can remain stable for several years. BPD can be reliably diagnosed in adolescence. Clinically significant features of BPD occur in 10% of young people, the condition is often accompanied by diverse mood symptoms. By the age of 16 years, 1.3% of young people can be diagnosed as suffering from a BPD. The variation in the comorbidity of the disorders is similar to that in adult patients except for suicide attempts, which are more common in BPD in youth. For some patients, the criteria for diagnosis are only met in young adulthood. It is recommended that BPD should be properly diagnosed in adolescence, as it enables the timely mobilization of the necessary social and clinical support measures. The use of mental health services is as common in adolescents with BPD as in adults in western countries.

Old age

The prevalence of BPD in public healthcare patients over 80 years of age has been estimated at 0.3%. The clinical assessment of personality disorders is complicated by changes in personality and cognitive functions with age: chronic depression, cognitive changes related to aging, and behavioural changes related to organic brain and systemic diseases. Symptoms of frontal and temporal lobe degenerative disease may resemble symptoms of BPD.

Presentations of BPD in different clinical settings

Emergency department (ED)

An individual with BPD may present to the emergency department (ED) with deliberate self-harm (DSH), non-suicidal self-injury (NSSI), panic attack, stress-induced dissociative/ psychotic episode or physical aggression leading to conflict with the law (thus brought by police). While in the busy ED, it is challenging to ascertain a BPD diagnosis for several reasons (including heightened emotional response, poor rapport, biased answering, lack of reliable informant, need for more emergent physical health care, and legal proceedings). However, the liaising psychiatry team should provide the option of further psychiatric

services utilisation for in-depth assessment and care, especially because these individuals need more structured mental health care. A reliable informant, if available, may help in informed decision-making and shared responsibility in the continuation of care. In case a patient visits ED repeatedly, the attending mental health professional may need to address the immediate psychosocial issue and try to establish rapport so that the patient follows-up for more regular out-patient care.

Out-patient department (OPD)

Individuals with BPD may consider visiting OPD in acute crisis (suicidal ideas, acute stress reaction, dissociative episodes), marital/family relationship conflicts, comorbid psychiatric illness (depressive disorder, anxiety disorder, problematic substance use), or being asked by competent authority (school/college authority, employer, court of law). A thorough assessment of premorbid personality, preferably from different sources with careful evaluation of the pattern of emotional responses and behaviour, helps the clinician diagnose BPD. A structured assessment using a pre-validated tool may help the clinician to achieve a diagnosis of BPD with higher confidence.

In-patient department (IPD)

A thorough personality assessment should be done in all the patients utilising psychiatric inpatient services considering the high burden of BPD (~20%) in this group of patients. This is even more relevant in patients with treatment resistance, poor adherence to pharmacological treatment, and multiple comorbidities. A comorbid diagnosis of BPD may help therapists make a more comprehensive management plan, including long-term therapeutic approaches – addressing the issues of future crisis management and improving the overall quality of life.

Assessment

Structured clinical assessment

Usually, a single unstructured interview is inadequate to make a diagnosis of personality disorders. Hence, in clinical diagnostics, it is good to use a structured interview (e.g., International Personality Disorder Examination [IPDE] – Hindi translation is available) or assessment scales (IPDE Screen, Personality Disorder Questionnaire – Version 4 [PDQ-4]) and supplement the findings with comprehensive clinical observations. Various semi-structured interviews and self-assessment methods have been developed for the diagnosis of

personality disorders, which are presented in table 2. Internationally, the Semi-structured Clinical Interview for DSM personality disorders (SCID-II / SCID-5-PD) is most commonly used in clinical practice and research settings to increase the diagnostic accuracy of personality disorders. **The information received from a third party (e.g., informants) does not necessarily increase the reliability of the diagnostic assessment.**

There are several confounders in the diagnosis of personality disorder. Issues related to culture, ethnic background, age of onset of the disorder, gender, developmental changes in personality and current psychiatric symptoms may impact the presentation of personality traits. In diagnostics, attention should be paid to the duration of the symptoms, because in personality disorders the symptoms should be recognizable at the end of adolescence or young adulthood and should describe the patient's functioning in the long term. When making a diagnosis, it is necessary to ensure that the general criteria for a personality disorder are met. When evaluating the diagnosis, each symptom criterion must be evaluated in the light of whether the feature is clearly pathological, long-term, and manifested in different contexts.

>> Insert table 2 here<<

Implementing good diagnostics in general/ primary healthcare is not simple. A proper assessment can be supported by a psychiatric consultation. Ways to deal with challenging patient behaviour are described in the "Clinical management" section and in the panel 2.

>> Insert panel 2 here<<

Psychological assessment

BPD is often accompanied by neuropsychological changes, especially related to executive functions. Lower ability to regulate information may evoke negative emotions related to emotional volatility. Disturbances in executive control may increase self-injurious behaviour.

Tests used for personality assessment can provide additional information about the person's ability to function and ways of processing information. A widely used method is the Rorschach inkblot test. Exner's Comprehensive System helps in scoring and interpreting its results. The Rorschach inkblot test should not be used to diagnose BPD, it is mainly useful for assessing thinking, quality of object relationships, emotional instability, and suicidality.

Assessment of comorbidities

Other comorbid disorders occur in 70% of those suffering from BPD. BPD patients may have multiple psychiatric disorders at the same time. It is also associated with higher physical morbidity than the rest of the population, which further increases the risk of suicide attempts. Common psychiatric comorbidities with BPD and tools to assess these comorbidities have been described in table 3.

>> Insert table 3 here<<

Assessment of medicolegal aspects

Self-harm, and physical or sexual abuse may lead to legal involvement in individuals with BPD. Comorbid dissocial traits and illicit substance use can also lead to conflicts with the law. Understanding the local and central legal standards on these aspects may be necessary while deciding the locus and modus of treatment. While underlying legal issues should not limit access to treatment, thorough record keeping and maintaining high standards of care is very important. All efforts should be made towards frequent monitoring and staff members should be well-informed to avoid any abuse during patient care.

Assessment of functional capacity

Impaired functioning related to BPD is corrected more slowly than symptoms of BPD. The social functioning, physical health and financial situation of a person suffering from BPD should be comprehensively evaluated when planning treatment and rehabilitation. Cognitive rehabilitation, psychoeducation and dialectical behaviour therapy may increase the functional capacity of a person suffering from BPD.

Assessment of Quality of life

Assessment of functioning and quality of life is important in planning the course of management. WHOQOL-BREF is a validated 26-item self-rated questionnaire to assess the quality of life objectively. The Hindi form of this scale is validated. While symptom remission and better emotional control are the initial focus of treatment, early social and occupational rehabilitation helps in recovery and improved quality of life.

Assessment of the ability to work (disability assessment)

Deterioration of functional ability is often accompanied by a decrease in work ability. The ability to work may be most impaired in youth and early adulthood, when the transition to working life may be threatened. Vocational rehabilitation courses can improve working/ life skills in adults, adults with disabilities, and young adults (18-25 years old). Such courses aim to increase life skills and support access to working life or education.

For young people, the risk of being marginalized is high both when transitioning to working life and at the beginning of working life, when employment relationships are often temporary. In order to prevent the development of marginalization, possible periods of sick leave should generally be limited to acute periods with severe symptoms of concurrent psychiatric disorders. Referral to enhanced vocational rehabilitation or its assessment and, if necessary, psychiatric rehabilitation is appropriate for the same reason.

If the patient has previously been able to work despite his/ her disorder, it can be considered that his/her work disability is not solely due to BPD. Medical reports related to the patient's ability to work must describe carefully:

- Symptoms
- Life course
- Diagnosis
- Ability to work and function in real situations
- Treatment attempts and their results
- Educational and work history
- Vocational rehabilitation plan

Specific issues in assessment

Risk assessment

Assessment of the risk of harm to self/others is one of the most important factors when formulating a management plan for BPD. A thorough history from the patient, relevant other informants and medical/ legal records followed by a detailed mental state examination is crucial. When patient's thought is inaccessible, and behaviour is unpredictable appropriate precautions should be taken. Brief hospitalisation can be advised in such cases for further observations.

Factors indicating high suicide risk

- High lethality of attempt

- Suicide intent
- Active planning
- Depressive cognition
- History of suicide attempts
- Recent loss
- Poor psychosocial support

Factors indicating a high risk for harm to others
- Prior harm to or threatening behaviours towards dependent children
- Poor self-control on dangerous impulses
- Active homicidal thoughts
- Poor insight

Considerations for the Indian context

Presentation, interpretation and treatment options for BPD may vary significantly depending on the culture. Although systematic data from India on the cultural effect on personality organisation and presentation are sparse, some points may be highlighted. Understanding and representation of self in the Indian context presents as interdependent self with fluid and flexible interpersonal bonds (36). Indian large and often joint families experiences allows for frequent arguments/ fights with minimal/ no fear of abandonment; in stark difference to the western values of individualism and independence. Indian family constructs are tolerant of dependent or even manipulative acts (somatic complaints, provocative actions, misleading messages, and self-destructive acts), which are not considered particularly deviant unless they cause significant dysfunction in other areas of life or to the significant others. Cultural acceptance of psychosomatic expressions of distress also curtails the need of strong emotional responses during the time of crisis or interpersonal difficulties.

Differential diagnosis

Disorders that are important for differential diagnosis of BPD are described in the table 4:

>>Insert table 4 here<<

Prognosis

Remission is common in BPD and, once achieved, is usually stable (37). More than half of the patients suffering from BPD no longer meet the diagnostic criteria for the disorder after five years. Likewise, depressive symptoms are alleviated and functional capacity recovers

clinically significantly in a few years. Among the symptoms, the fastest to relieve are self-destructiveness and identity diffusion. Impulsivity and fluctuations in emotional life are relieved more gradually with increasing age. As personality instability eases, mood and anxiety disorders also decrease, but do so more slowly. Depression slows down recovery from BPD. Comorbid PDs have also been found to be alleviated in patients with BPD during a six-year follow-up (38).

The treatment results seem to be poor when the persons suffering from a BPD have a lifestyle that predisposes them to chronic diseases and high utilization of health services. Even at the age of over 50 years, the features of BPD may cause failures in relationships. Key prognostic factors are summarized in table 5.

>>Insert table 5 here<<

Management

Central to the treatment of someone suffering from a BPD are psychotherapeutic methods. They can be combined with other forms of treatment. The therapeutic relationship and the effectiveness of the therapy may be jeopardized if shame is not recognized in the therapeutic relationship and in the patient's most central emotional experiences. According to patients' reports, recovery is facilitated when the care provider offers security, respect, trust and understanding, but at the same time guides towards change by being appropriately active and using specific strategies. At the beginning of the treatment, the therapist should:

- Carry out a wide-ranging risk assessment
- Define crisis management options
- Work on the details of the treatment in coordination with the patient
- Avoid communication that increase stigma or negatively judge the patient

Treatment utilization

It may be useful to understand the treatment of borderline personality according to the well-known phase model of substance use treatment:

- In the pre-contemplation phase, there is a lack of awareness of the need for change.
- In the contemplation phase, the advantages and disadvantages of the change seem equal.
- In the preparation phase, the person suffering from the disorder has understood the need for change and tells others about it.

- In the action phase, the person suffering from the disorder is committed to his/her treatment and works for change.

Typical features in the treatment of those suffering from borderline personality are:

- Abundant and short-term use of different treatment services and forms (Emergency services, primary/ general health care, specialist mental health care, complementary/ alternative help).
- Difficulty adhering to treatment agreements, which can complicate the treatment of both mental and physical illnesses.
- Difficulty establishing a long-term psychotherapeutic treatment contact: the patient usually attends psychotherapy only for a short time and ends up using the services of many different therapists.

Clinical risk factors for discontinuation of psychotherapy include (1) high aggression and impulsivity, (2) high comorbidity with other mental disorders, and (3) high lifetime suicide attempts.

Symptoms of BPD are often connected to somatic problems and increase use of health services. In western countries, almost half of the BPD patients in general/ primary care may be without appropriate psychiatric treatment, and the need for treatment may not be noticed. The situation is likely to be worse in India. Patients with BPD who are being treated in general/ primary health care often use a lot of general/ primary health care services, are often in contact with doctors by phone between appointments and take several different medications at the same time. When BPD is treated in general/ primary care, it is beneficial to offer regular office visits (regardless of their physical health status) to avoid frequent and impulsive use of services. The patient's anxiety is relieved by the knowledge that the doctor will not leave him without support. It is appropriate for the primary/ general health services to be in contact with the many entities that provide the BPD patient social and healthcare services because of their multiple needs, e.g., people suffering from BPD in general/ primary care have remarkably frequent childhood trauma experiences.

Assessment of the need for treatment

When assessing the need for treatment, attention must be paid to current as well as long-term symptoms:

- For planning consistent, patient-friendly and systematic treatment
- To provide a long-term care relationship

- For intermittent, symptomatic treatment, which may be sufficient for those with milder symptoms

The following must be taken into account when assessing the patient's risk

- Acute and chronic suicidality
- Suicide plans
- Previous plans and attempts
- Factors that potentially threaten the care relationship
- Impulsivity and substance use
- Degree of distress and hopelessness
- The ability to perceive alternatives
- The ability to experience and receive care

Telling the diagnosis

The diagnosis should be told to the patient in order to promote his/ her autonomy and support patient education and cooperation. It is necessary to provide the patient with information about what a borderline personality means, what is supposed to cause it, and what is the current understanding of effective treatment. Telling the diagnosis and psychoeducation have been found to have positive effects on the therapeutic relationship. Psychoeducation may alleviate symptoms of BPD.

Psychotherapies

Randomized controlled studies on sufficiently large samples and diagnostically specified naturalistic follow-up studies on the effectiveness of psychotherapies for borderline personality are available (39). In all psychotherapy studies, the patients have received drug treatments at the same time. A summary of psychotherapy methods studied in controlled settings is presented in table 6.

>>Insert table 6 here<<

Access to psychotherapy according to effective methods is limited in India, and it is necessary to improve the coverage of training/ education of mental health professionals. The psychotherapist must have experience in the treatment of people suffering from BPD or receive close supervision as support. About a third of those receiving psychotherapy have been found to have only a mild PD (40), suggesting a need for better prioritization of services.

Psychotherapy for BPD

Psychotherapies of limited duration are useful in the treatment of PDs. A person suffering from a PD may also benefit from group psychotherapies.

Dialectical behaviour therapy (DBT) reduces difficulties in regulating emotions, impulsivity and feelings of emptiness. It also reduces hostility and self-injurious acts (including suicide attempts) in women with BPD better than treatment as usual. In addition, DBT reduces substance use in women with BPD who have comorbid substance dependence. The treatment result of DBT in reducing symptoms of instability, suicide attempts and self-harming acts is apparently just as good, even if the patient has concurrent post-traumatic stress syndrome. Even short-term (20 weeks) DBT, in which only group skills training is implemented, is effective for typical symptoms of BPD and it also reduces the number of self-harming acts (41).

Cognitive-behavioural therapy (CBT) is more effective than treatment as usual (42,43). CBT may be more effective than treatment as usual in reducing posttraumatic stress symptoms in patients with BPD. Short-term interventions derived from CBT may also be equally effective.

Schema-focused psychotherapy apparently reduces, at least in women, the severity of BPD and the anxiety and depressive symptoms associated with it and improves the quality of life.

Mentalization therapy is effective in the treatment of BPD, and mentalization therapy implemented in outpatient care is as effective as mentalization therapy implemented in day hospital treatment. In a study conducted in Great Britain, mentalization therapy was found to be effective even in patients with several comorbid PDs. Mentalization therapy is effective even in young people (44).

Transference-focused psychotherapy is effective in patients suffering from BPD. Systematically implemented supportive group therapy that includes psychoeducation and is based on a psychodynamic model may also be effective. Transference-focussed psychotherapy, supportive psychotherapy and DBT may be equally effective in treating depression and anxiety symptoms and improving functioning in people with BPD (45).

The STEPPS program (Systems Training for Emotional Predictability and Problem Solving) implemented in an outpatient setting, in addition to the existing conventional psychiatric treatment, apparently has a large effect on the symptoms and functional capacity of BPD

Kommentar [314]: Linehan MM. Skills training manual for treating borderline personality disorder. New York, NY, US: Guilford Press; 1993. xii, 180 p. (Skills training manual for treating borderline personality disorder).

Kommentar [315]: Davidson K, Norrie J, Tyrer P, Gumley A, Tata P, Murray H, et al. The effectiveness of cognitive behavior therapy for borderline personality disorder: results from the borderline personality disorder study of cognitive therapy (BOSCOT) trial. J Pers Disord. 2006 Oct;20(5):450–65.

Kommentar [316]: Livesley WJ. Practical management of personality disorder. New York, NY, US: Guilford Press; 2003. xii, 420 p. (Practical management of personality disorder).

Kommentar [317]: Bateman A, Fonagy P. Impact of clinical severity on outcomes of mentalisation-based treatment for borderline personality disorder. Br J Psychiatry. 2013 Sep;203(3):221–7

Kommentar [318]: Doering S, Hörz S, Rentrop M, Fischer-Kern M, Schuster P, Benecke C, et al. Transference-focused psychotherapy v. treatment by community psychotherapists for borderline personality disorder: randomised controlled trial. Br J Psychiatry. 2010 May;196(5):389–95.

(46). A 14-week emotion regulation group aimed at understanding and accepting emotions, implemented alongside the patient's existing outpatient treatment, seems useful in the treatment of women suffering from intentional self-harm and BPD or its features. Young people suffering from BPD may also benefit from emotion regulation coaching.

Experts disagree about the usefulness of long-term and intensive (e.g., inpatient) psychotherapy in the treatment of patients with BPD. In a small naturalistic group comparison study, it was found that a therapy designed for BPD and based on a manual (DBT and dynamic-deconstructive psychotherapy) was more effective than conventional psychotherapy (47).

When considering long-term psychotherapy, it is necessary to make an accurate diagnosis and pay attention to the patient's (i) ability to build relationships, (ii) severity of self-esteem vulnerability, (iii) impulsivity, and (iv) antisociality. Problems on these dimensions may indicate a risk of complications when using therapy other than that designed for the treatment of BPD.

In the early stages of the disorder, DBT is the recommended form of therapy, if the symptoms are severe, hospital treatments are frequent, especially if self-harming behaviour is frequent (48).

Family therapy

Educational and skill-oriented family interventions offered in groups may improve family functioning and the relatives' well-being. Counselling families can lighten the burden on relatives, and it can alleviate potential conflicts between the patient and relatives, and between relatives and care providers. The most common family problems are communication difficulties, difficulties in dealing with hostile reactions, and fear of the patient's suicide. Key principles and features of family psychoeducation (49) are:

- Provision of information about treatment and prognosis and the verification of understanding of the information provided.

- Reduction of expressed emotions (expression of anger and criticism within the family).

- Increasing the ability of family members to take each other's experiences seriously and considering them valid from the individual's perspective.

Family intervention should usually be started at the beginning of the treatment.

18

Drug and neuromodulation treatments

In some patients, antipsychotics reduce hostility, suspiciousness, affect dysregulation, cognitive and perceptual distortions, psychotic symptoms, and intentional self-harm related to BPD (50).

The mood stabilizers valproate, carbamazepine, lamotrigine and topiramate may reduce the impulsivity and aggressiveness associated with BPD in some patients. Valproate should be used in women of childbearing age or in pregnant women only if other treatments are not effective or appropriate. Oxcarbazepine may also be an useful alternative.

Selective serotonin reuptake inhibitors (SSRIs) may reduce the difficulty of impulse control and emotion regulation associated with BPD in some patients (table 7) (51-55).

>>Insert table 7 here<<

Benzodiazepines are not a recommended drug treatment for the symptoms of BPD. There is no high-quality treatment research available on their use in the treatment of BPD. Once started, stopping the use of benzodiazepines is very difficult for patients with cluster B PDs including BPD; hence, the development of benzodiazepine dependence is a significant risk in BPD. Benzodiazepine may also increase impulsive behaviour. Alternatives to benzodiazepines may include buspirone and pregabalin, which have been shown to be effective in treating generalized anxiety disorder and are non-addictive. However, their use has not been studied in the treatment of borderline personality. Pregabalin enhances the effect of narcotics, so it is not suitable for drug-dependent patients due to the risk of abuse. In some patients, intranasal oxytocin may relieve the anxiety associated with borderline personality in social situations, but the treatment results so far are contradictory and oxytocin is not yet in general clinical use in the treatment of borderline personality.

The results of few small studies suggest that omega-3 fatty acids may alleviate symptoms associated with borderline personality. Supervised disulfiram treatment can be helpful in the treatment of alcohol dependence in patients with borderline personality disorder.

Electroconvulsive therapy (ECT) does not alleviate symptoms of BPD. However, BPD is not a contraindication to ECT for depression. Repetitive transcranial magnetic stimulation (rTMS) may relieve anxiety related to BPD in some patients, but for now it is an experimental treatment for this indication.

Kommentar [323]: Leichsenring F, Rabung S, Leibing E. The efficacy of short-term psychodynamic psychotherapy in specific psychiatric disorders: a meta-analysis. Arch Gen Psychiatry. 2004;61(12):1208–16

The effort to alleviate the different psychiatric symptoms of BPD may lead to inappropriate polypharmacy. When planning drug treatment, one must consider the increased risk of suicide with drugs and the risk of impulsive suicide attempts, susceptibility to drug dependence, substance use and self-will in the implementation of drug treatment, as well as the patient's other illnesses.

Hospital treatment

The planning of treatment requires an integrated service package. A short crisis intervention in the emergency department, combined with subsequent specialized outpatient treatment, can reduce the need for psychiatric hospital treatment in the follow-up of an acutely suicidal borderline personality patient. A crisis treatment plan designed and agreed together with the patient guarantees the durability of the treatment relationship but does not seem to increase the effectiveness of the treatment.

Issues needing round-the-clock hospital care include:

- Acute serious suicidal risk

- Psychotic symptoms that are not controlled in outpatient care

- Severe dissociation symptoms, accompanied by a significant impairment of functional capacity

- Severe mood disorder

- Uncontrolled substance use in a patient with severe symptoms

Standard, reliable, and comprehensive research evidence on the results of round-the-clock hospital care is not available. Due to the risk of deterioration of the clinical condition and especially an increase in self-harming activity, the treatment period must be as structured as possible, as additional support and experience of the predictability of the environment can improve the patient's well-being. Sending a patient to an unstructured program may do more harm than good when the patient has made a mild suicide attempt related to chronic suicidality. In the context of hospital treatment, it is appropriate to find out the patient's wishes for his treatment and the priority of the treatment methods, and to jointly agree on plan for the continuation. Stormy emotionality may arouse difficult emotional reactions in treatment units. Managing them is important to reduce risks.

Very intensive inpatient treatment based on evidence-based psychotherapies for borderline personality, provided by staff trained in that treatment model, may be helpful. In the treatment of borderline personality, mentalization therapy implemented in day hospital conditions is effective. Characteristics of effective day hospital care are:

- Flexible, structured care

- Consideration of compliance with treatment

- A clear goal

- Consistent and shared understanding of BPD

- Integration into the rest of the care package

Clinical management of borderline personality

The following principles are central to the clinical management of BPD:

- The treatment has a clear framework.

- The work has jointly agreed goals and targets

- The therapist is active

- Emotions are at the centre of work

- The quality of the relationship is constantly monitored

Mindfulness may lay the foundation for the ability to recognize and name emotions and regulate them. Ways to modify behaviour in managing symptoms include, for example, shifting attention elsewhere and using substitute activities. The patient can direct his attention to pleasant or everyday activities. Compensatory activities refer to less dangerous means of affect regulation compared to suicidal, impulsive, or otherwise harmful behaviour. Among other things, intense physical activity or the use of cold sensations have been recommended in this context. For example, the patient can submerge his hands up to the forearms in cold water or hold an ice cube in his hand. Relaxation, positive mental imagery, and reminder cards or a diary can also be used to manage symptoms. Behavioural therapeutic methods can produce the first experiences that it is possible to regulate emotional states.

Some patients may continue the harmful and addictive use of medicines. In this case, an attempt can be made to ensure appropriateness treatment, for example by means of notifying the pharmacy (with patient's agreement).

Clinical management of crises, dissociations, and anger

Increasing distress (escalating dysphoria) means an expanding, intense and often panic-like feeling of discomfort, which is often accompanied by impulsivity, such as self-destruction, and cognitive fragmentation and dissociation. The patient's emotional experiences should be taken seriously so that instead of the content of the crisis, the focus is on the patient's feelings and a clear understanding of his/ her current situation and experiences. In a crisis, patients hope more for sensitive listening, genuine interest, and presence than for a concrete answer to the problem in question. Patients perceive the assessment of interpersonal motives and cognitive reformulation before the formation of a good cooperative relationship as belittling. A strong increase in external control, criticism or a counter-assertive style must be avoided, as they seem to increase the risk of worsening the crisis.

A flexible and warm attitude that takes the patient's experiences seriously is considered important in the treatment of dissociative states and difficulties in regulating emotions. The soothing speech of the person caring for the patient can bring relief when the patient's emotional arousal or cognitive fragmentation increases or s/he begins to suffer from dissociation. When dissociation symptoms have already appeared, the patient can be reassured, for example, by telling them that the symptom is very unpleasant but temporary. Many patients need coping mechanisms to manage their dissociative symptoms before they are able to discuss their traumatic experiences.

In anger management, the patient is first allowed to vent his anger, after which he can be asked to describe his anger in more detail. When the anger has levelled off, the goal is to examine the emotional experience and its expression realistically together with the patient in such a way as to avoid a punitive attitude and rejection of the patient's experience. Only when the emotional state has calmed down, is it possible to examine the patient's own possible contribution to the problems.

Pain-reducing medical treatment can be used if necessary.

Rehabilitation

A multi-professional assessment of the need for rehabilitation is appropriate in association with the monitoring of psychiatric treatment. The patient may benefit from psychiatric rehabilitation if his/ her ability to function is severely impaired over a long-term (e.g., prolonged sick leave, long-term employment difficulties) or if s/he has deficits in psychological functioning, such as the inability to organize his/ her own life and plan for the future. The patient's need for neuropsychological rehabilitation must be assessed especially when s/he has specific learning or other neuropsychological deficits.

Working life skills can also be improved with vocational rehabilitation. Group-based course activity, e.g., adaptation training, may be a suitable option for youth with disabilities. People suffering from mental health disorders in working life can apply for disability benefits.

Organization of care services

The systematic planning of the treatment of borderline personality requires the establishment of special clinical teams to ensure sufficient competence and effective continuing professional education of team members and other health care professionals. The main responsibility for diagnosis, treatment and integration of treatments belongs to the psychiatric outpatient unit, which works in close cooperation with the psychiatric hospital department, general/ primary health care, substance abuse treatment, the social sector, and the providers of psychotherapy services. The treatment of a person suffering from a borderline personality should be organized and carried out as far as possible in outpatient care and, in the case of hospital treatment, in day hospital conditions.

The primary task of general/ primary health care is to screen patients and refer them to specialized medical care. Preparing for crisis situations is the cornerstone of treatment. However, where applicable, treatment can be arranged in general/ primary health care.

The coordination of the patient's overall care is facilitated by naming a responsible person or clinical team. The service supervisor is responsible for monitoring the implementation of the treatment plan and, if necessary, gives other operational units advice to support treatment measures or decisions.

Health and substance abuse services must be coordinated flexibly and by promoting the possibility of smooth consultation. The patient benefits more from the treatment if both substance abuse disorder and psychiatric disorder are treated in the same unit.

Patients may simultaneously use various social welfare services, such as child protection support measures and income support. Cooperation with different actors can be promoted in network meetings, which are especially necessary in the treatment of patients at risk of exclusion.

General/ Primary health care

Psychiatric consultation

The possibility of psychiatric consultations can increase the general/ primary care physician's ability to assess the patient's need for treatment. It is necessary to organize adequate opportunities for regular consultations. It is often appropriate to conduct consultations on a long-term basis. Regular consulting activities can also serve as a form of continuing education. Psychiatric consultation is especially relevant when:

- The patient uses a lot of health or social care services

- The patient does not commit to the treatment of his physical illness

- The symptomatology is difficult to control, but the patient does not want hospital treatment

- The need for involuntary care is assessed as required by law

- The symptomatology presents a differential diagnostic problem

- The treatment given by the general practitioner has not produced a sufficient result

Care in general/ primary health setting

The majority of people with personality disorders use general/ primary health care services like the rest of the population. People suffering from personality disorders almost invariably come to treatment because of a physical illness or their symptoms, other mental health disorder, or a difficult life situation. BPD may lead to problems with adherence to medical treatment.

Regarding treatment of other disorders/ diseases, it is generally necessary to follow the criteria set for them. The general/ primary care doctor should have at his/her disposal, consultation and/or supervision of specialized medical care that is required by the situation and can be implemented quickly enough, especially in threatening situations. A personality

disorder may require more specific psychotherapeutic and drug treatment carried out in a mental health specialist care, when the patient has

- Long-term and recurring problems

- Difficulties that are not limited only to crisis situations

- A threat of loss of functional capacity

- A threat of loss of ability to work or study

- Low motivation for treatment

- Less ability to commit to treatment

Patients suffering from hypochondriasis, somatization symptoms or many somatic diseases should primarily be treated in general/ primary care. When a person suffering from a borderline personality uses a lot of general/ primary care services, a general/ primary care doctor should (i) actively consult specialized psychiatric care; (ii) establish a confidential, contractual treatment relationship with the patient (it is good to set motivation for treatment as the first goal, because it may be very difficult for the patient to enter into a regular treatment relationship and comply with agreements); (iii) prepare a treatment plan according to the patient's needs; and (iv) assess and, if necessary, intervene in the patient's risky behaviour, such as suicidality.

The patient's risk behaviour is addressed by expressing concern about the patient's functioning; by offering the opportunity to talk about burdensome matters in calm conditions; and by openly asking what kind of help the patient expects during the critical phase. After the critical phase, the patient's condition should be actively monitored; and the patient should be explained that the attending physician is not always available and that there are alternative care providers from whom help is available during emergency hours.

The attending physician should be aware that the patient evokes strong emotional reactions in care providers, which may be difficult for the doctor to tolerate and may complicate the patient's treatment. S/he should cooperate with specialized psychiatric care and, if necessary, substance abuse services

Table 1. Diagnostic criteria/guidelines for borderline personality disorder	
ICD-10 guidelines	**DSM-5 criteria**
F60.3 Emotionally unstable personality disorder	**301.83 Borderline personality disorder**
A personality disorder in which there is a marked tendency to act impulsively without consideration of the consequences, together with affective instability. The ability to plan ahead may be minimal, and outbursts of intense anger may often lead to violence or "behavioural explosions"; these are easily precipitated when impulsive acts are criticised or thwarted by others. Two variants of this personality disorder are specified, and both share this general theme of impulsiveness and lack of self-control. **F60.30 Impulsive type** The predominant characteristics are emotional instability and lack of impulse control. Outbursts of violence or threatening behaviour are common, particularly in response to criticism by others. Includes: explosive and aggressive personality (disorder). Excludes: dissocial personality disorder (F60.2) **F60.31 Borderline type** Several of the characteristics of emotional instability are present; in addition, the patient's own self-image, aims, and internal preferences (including sexual) are often unclear or disturbed. There are usually chronic feelings of emptiness. A liability to become involved in intense and borderline relationships may cause repeated emotional crises and may be associated with excessive efforts to avoid abandonment and a series of suicidal threats or acts of self-harm (although these may occur without obvious precipitants). Includes: borderline personality (disorder)	1. Frantic attempts to avoid real or imagined rejection. Note Do not take into account suicidal behaviour or self-injury, etc. (criterion 5) 2. Borderline and intense interpersonal relationships, characterised by alternating between extreme idealisation and belittling 3. Identity disorder: significantly and continuously borderline self-image or experience of self 4. Impulsivity in at least two areas of potential self-harm (e.g., spending, sex, use of substances, reckless driving, binge eating). Note do not consider self-destructive behaviour or self-injury, etc. (criterion 5) 5. Repeated self-destructive behaviour, gestures or threats suggesting it, or self-cutting etc. 6. Affective instability due to significant mood reactivity (e.g., intense episodic dysphoria, irritability, or anxiety, usually lasting a few hours and rarely longer than a few days) 7. Chronic feelings of emptiness 8. Inappropriate, intense anger or difficulty controlling anger (e.g., frequent sudden or constant anger, frequent fighting) 9. Transitory stress-related paranoid thinking or severe dissociative symptoms

Table 1. Diagnostic criteria/guidelines for borderline personality disorder

ICD-11 Diagnostic requirements (https://icd.who.int/browse11/l-m/en#/http%3a%2f%2fid.who.int%2ficd%2fentity%2f37291724)

Personality Disorder 6D10

Personality refers to an individual's characteristic way of behaving, experiencing life, and of perceiving and interpreting themselves, other people, events, and situations. Personality Disorder is a marked disturbance in personality functioning, which is nearly always associated with considerable personal and social disruption. The central manifestations of Personality Disorder are impairments in functioning of aspects of the self (e.g., identity, self-worth, capacity for self-direction) and/or problems in interpersonal functioning (e.g., developing and maintaining close and mutually satisfying relationships, understanding others' perspectives, managing conflict in relationships). Impairments in self-functioning and/or interpersonal functioning are manifested in maladaptive (e.g., inflexible or poorly regulated) patterns of cognition, emotional experience, emotional expression, and behaviour.

The diagnostic requirements for Personality Disorder present a set of Essential Features, all of which must be present to diagnose a Personality Disorder. Once the diagnosis of a Personality Disorder has been established, it should be described in terms of its level of severity:
- 6D10.0 Mild Personality Disorder
- 6D10.1 Moderate Personality Disorder
- 6D10.2 Severe Personality Disorder

A category relevant to this grouping is:
- QE50.7 Personality Difficulty

Personality Difficulty is not classified as a mental disorder, but rather is listed in the grouping of Problems associated with Interpersonal Interactions in the chapter on Factors Influencing Health Status or Contact with Health Services. Personality Difficulty refers to pronounced personality characteristics that may affect treatment or health services but do not rise to the level of severity to merit a diagnosis of Personality Disorder.

Personality Disorder and Personality Difficulty can be further described using five trait domain specifiers. These trait domains describe the characteristics of the individual's personality that are most prominent and that contribute to personality disturbance. As many as necessary to describe personality functioning should be applied.

Trait domain specifiers that may be recorded include the following:
- 6D11.0 Negative Affectivity
- 6D11.1 Detachment
- 6D11.2 Dissociality
- 6D11.3 Disinhibition
- 6D11.4 Anankastia

Clinicians may also wish to add an additional specifier for 'Borderline pattern':
- 6D11.5 Borderline pattern

Table 1. Diagnostic criteria/guidelines for borderline personality disorder

The Borderline pattern specifier has been included to enhance the clinical utility of the classification of Personality Disorder. Specifically, use of this specifier may facilitate the identification of individuals who may respond to certain psychotherapeutic treatments.

The **Borderline pattern** descriptor may be applied to individuals whose pattern of personality disturbance is characterised by: A pervasive pattern of instability of interpersonal relationships, self-image, and affects, and marked impulsivity, as indicated by many of the following(https://www.bpdfoundation.org.au/diagnostic-criteria.php#ICD11):

- Frantic efforts to avoid real or imagined abandonment
- A pattern of borderline and intense interpersonal relationships
- Identity disturbance, manifested in markedly and persistently borderline self-image or sense of self
- A tendency to act rashly in states of high negative affect, leading to potentially self-damaging behaviours
- Recurrent episodes of self-harm
- Emotional instability due to marked reactivity of mood
- Chronic feelings of emptiness
- Inappropriate intense anger or difficulty controlling anger
- Transient dissociative symptoms or psychotic-like features in situations of high affective arousal

A complete description of a particular case of Personality Disorder includes the rating of the severity level and the assignment of the applicable trait domain specifiers (e.g., Mild Personality Disorder with Negative Affectivity and Anankastia; Severe Personality Disorder with Dissociality and Disinhibition.) The Borderline pattern specifier is considered optional but, if used, should ideally be used in combination with the trait domain specifiers (e.g., Moderate Personality Disorder with Negative Affectivity, Dissociality, and Disinhibition, Borderline pattern).

Panel 1. **The five-factor model of the personality disorders** (12)
The five-factor model is the most widely studied temperament model, and the most systematic research data is available on it. Temperament traits corresponding to it have been described in many different cultures.
Five factors with subsections (and ICD-11 pathological equivalents[#])

Extroversion / positive emotionality
 	
    • Warmth, generosity, assertiveness, activity, excitement seeking, positive emotions
 	
        ○ ICD-11 (pathological equivalent): Detachment

Neuroticism / negative emotionality
 	
    • Anxiety, hostility, depression, self-consciousness, impulsivity, vulnerability
 	
        ○ ICD-11 (equivalent): Negative affectivity

Openness to experiences
 	
    • Imagination, aesthetics, feelings, action, ideas, values
 	
        ○ ICD-11: No equivalent

Agreeableness
 	
    • Trust, honesty, altruism, adaptability, modesty, tenderness
 	
        ○ ICD-11 (pathological equivalent): Dissociality

Conscientiousness
 	
    • Competence, orderliness, sense of duty, goal orientation, self-discipline, judgment
 	
        ○ ICD-11 (pathological equivalent): Anankastia

 # The ICD-11 trait domain of Disinhibition would map partly into dissociality and (low) conscientiousness in the Five Factor model of personality.

Table 2. Structured methods for diagnosing personality disorders and borderline personality.

Method name and abbreviation	International Personality Disorder Examination (IPDE)	Structured Clinical Interview for DSM IV Personality Disorders (SCID-II)	Structured interview for DSM-IV Personality Disorders (SIDP-IV)	Zanarini Rating Scale for Borderline Personality Disorder (ZAN-BDP)	Borderline Personality Disorder Severity Index (BPDSI)	Diagnostic Interview for Borderlines (Revised) (DIB-R)
Coverage of personality disorders	All	All	All	Specific	Specific	Specific
Criteria						
• DSM-IV/5	X	X	X	X		X
• ICD-10	X					
Psychometric properties						
Internal consistency (Cronbach's alpha)	-	0.53–0.94	-	0.85	0.82–0.93	0.87
Inter-rater reliability	0.71–0.92	0.48 to 0.98	0.32 to 1.00	0.66–0.97	0.92–0.93	0.55 to 0.94
Test-retest reliability	0.62 to 1.00	0.38–0.63	0.16–0.84	0.59–0.96	0.72 to 0.77	0.57–0.73
Sensitivity	0.94	0.12 to 1.00	0.39	-	0.92 to 0.95	0.81–0.96
Specificity	1.00	0.72–0.97	-	-	0.90 to 0.95	0.88–0.94

Items and use						
Number of questions	157	120	160	-	70	125
Response time (min)	90–120	30–60	30–90	-	-	60
Research use (R) or clinical use (C)	R/C	R/C	R/C	R/C	R/C	R/C

Panel 2. Borderline personality disorder in general/ primary health care (29)
Tips for patient interaction
Familiarize yourself with the symptoms of the disorder and the common causes of inappropriate behaviour.
Treating a borderline personality disorder patient can be demanding even for an experienced clinician. You should not set your goals too high.
There is no quick fix for non-life-threatening self-injurious behaviour. Hospitalization may not always be beneficial.
Take the patients experiences seriously and understand that they have their own reasons for experiencing things the way they do. Name the feelings you think the patient has, such as rejection, anger, and shame, before focusing on the 'facts'. Identify the real stress experienced by the patient.
Avoid being provoked by the patient's disturbing behaviour.
Give the patient regular, time-limited appointments, make exceptions for new onset illness.
Work within the limits you set at the beginning of the treatment and deviate from them only in an emergency.
Good treatment can only be based on an agreement on the possibility of open communication with other parties treating the patient.
Avoid polypharmacy and prescribing large quantities of potentially toxic drugs, e.g., tricyclic antidepressants and benzodiazepines.
Avoid prescribing potentially addictive drugs such as benzodiazepines, sleeping pills, and pain relievers that affect the central nervous system.
Set limits on histrionic and pushy behaviour without judging the patient and their actions.
The patient is always responsible for his actions (if it is not due to psychosis).
Do not reward disruptive behaviour by giving increased attention, manage them by offering regular appointments that do not depend on the patient's harmful activity.

Table 3: Assessment of psychiatric comorbidities in BPD

Comorbid psychiatric conditions	Clinical presentations	Clinical instruments
Major Depressive Disorder (MDD)	Episodes of major depressive disorders (MDD) are not uncommon among individuals with BPD, especially during stress. Additional treatment of MDD is essential during the episode.	Hamilton Depression Rating Scale (HDRS)
Dysthymia	Persistent low-grade depressive symptoms with distress lasting for years (≥ 2 years) is a common finding in BPD.	Cornell Dysthymia Rating Scale (CDRS)
Anxiety and panic attacks	Acute anxiety attacks and panic attacks are common manifestations of BPD. Episodes of attacks are more pronounced at times of perceived abandonment or rejection.	Hamilton Anxiety Rating Scale (HAM-A)
Insomnia	Insomnia is frequent. Comorbid depression, anxiety or substance use may add to the dysfunctions related to BPD.	Pittsburgh Insomnia Rating Scale (PIRS)
Somatic symptom disorder (SSD)	Somatoform pain symptoms are often a significant cause of occupational dysfunction in individuals with BPD. Adequate pain management significantly improves the quality of life.	Patient Health Questionnaire-15 (PHQ-15)
Dissociative disorders	Stress-induced dissociative episodes are common. Comorbid substance use disorder or depressive episode imparts diagnostic and management difficulties. Dissociative identity disorders are amongst the most difficult to manage.	Dissociative Experiences Scale (DES)
Impulse control disorder (ICD)	Intense anger may lead to harm to self and others. An additional diagnosis of ICD may be provided when impulse control issues predominate the clinical picture and pose significant dysfunction.	Minnesota Impulse Disorders Interview (MIDI)
Substance use disorders	Comorbid substance use poses a significant burden on physical and psychological health. The risk of impulsive harm to self and others is higher	Alcohol, Smoking and Substance Involvement Screening Test

	during episodes of intoxication and withdrawal.	(ASSIST)
Brief psychotic episode	Stress-induced paranoid symptoms lasting for a few hours are common. Additional diagnosis of brief psychosis may be required when psychosis persists for more than one day.	Brief psychiatric rating scale (BPRS)
Posttraumatic stress disorder (PTSD)	Childhood physical and sexual abuses are common. A comorbid diagnosis of PTSD may be provided when presented independently. When symptoms of BPD emerge after significant, chronic or repetitive psychological traumas, a diagnosis of complex PTSD may be given.	PTSD symptoms scale (PSS)
Eating disorders (ED)	Bulimia and other eating disorders can be present as comorbid conditions with BPD. Body image disturbance is common in both anorexia and BPD. An additional diagnosis should be given when the diagnostic criteria for an independent eating disorder are met.	Eating Disorder Diagnostic Scale (EDDS)

Table 4. Factors predicting the outcome of the treatment of borderline personality during a ten-year follow-up period (147).

Factors explaining recovery	HR = hazard ratio
Faster recovery	
Severity of perceived violence	HR 0.94, p < 0.03
No sexual abuse	HR 1.48, p = 0.006
Childhood intellectual ability	HR 1.03, p < 0.05
No PTSD symptoms	HR 1.56, p = 0.002
No concurrent cluster C personality disorder	HR 1.84, p < 0.001
No previous hospitalizations	HR 1.68, p = 0.001
The parents do not have a mood disorder	HR 1.38, p < 0.03
The parents do not have a substance abuse disorder	HR 1.84, p < 0.001
Good professional development	HR 1.68, p < 0.001
Temperament	
- agreeableness	HR 1.04, p < 0.001
- conscientiousness	HR 1.03, p < 0.001
- extroversion	HR 1.04, p < 0.001
Slower recovery	
Temperament	
- negative emotionality	HR 0.96, p < 0.001
Severity of neglect	HR 0.98, p < 0.002
The severity of the abuse	HR 0.96, p < 0.002

Table 5: Differential diagnosis of the borderline personality disorder	
Differential diagnosis	**Description**
Depression and dysthymia	Similar in their sense of emptiness and loneliness and the risk of suicide, BPD patients are convinced that they are self-sufficient, despite being dependent on others (it is particularly evident in the state of mania) while depressed people are aware of their need for help, but are usually capable of being completely autonomous. Sudden anger characteristics are rare in depression; although there are symptoms in common, in true depression a sense of mistrust with resignation prevails, in the borderline, this mistrust is accompanied by anger and it is also necessary to distinguish the isolated reactive depressive episode from the maladaptive behavioural nature that underlies the depressive episode.
Bipolar disorder	"Bipolarity" differs from "borderline personality disorder" mainly due to the degree of pervasiveness in the subject's psychic sphere. In the BPD, the oscillation is frequent, and the cycles are short, they last a few days or a few hours. The overhang is usually reactive to something that has to do with the perception of rejection by the other. Minimal signs of disinterest rather than alleged frustrations or losses are magnified and dramatized. In bipolar disorder, the oscillations are more discontinuous and lasting and can occur unexpectedly, regardless of the external situation.
Post-traumatic stress disorder	Both have anxiety, fear, anger but in the post-trauma stress the trauma that caused it is evident and often recent, even if it may develop in the BPD.
Somatoform disorder	In the BPD, there is no real simulation of all the symptoms of a pathology but mainly an altered emotional state. Somatic symptoms are commonly manifested in BPD.
Histrionic PD	Both want attention, but the histrionic seeks companionship and often appears happy in appearance, puts in place a seductive and sociable appearance, while the borderline shows his anger and frustration.
Narcistic PD	Both are very sensitive to criticism, but the narcissist, however, has a

	fixed sense of his superiority (grandiose self) that the borderline does not have stably.
Antisocial PD	In the borderline antisocial behaviours (transgressing the rules, lying, manipulating) can occur but the patient never loses the sense of guilt or the ability to feel remorse, while the BPD can repress them, but they are always very present.
Schizotypal PD	Both present cognitive distortions, behavioural eccentricities and semi-psychotic symptoms during crises (for example, delusions, paranoia, derealization, depersonalizations and dissociations), but the symptoms of schizotypal are deeper, often with unusual perceptual experiences, bordering on schizophrenia; they also have in common the unstable emotionality (rapidly fluctuating mood) and the fear of social and personal rejection. However, the borderline can look a lot like schizotypal, especially if it has comorbidities with psychotic or obsessive symptoms

	Dialectical Behaviour Therapy **(Marsha Linehan)**	**Mentalization Therapy** **(Anthony Bateman & Peter Fonagy)**	**Schema Therapy** **(Jeffrey Young)**	**Transference-focused therapy** **(Otto Kernberg, John Clark, and Frank Yeomans)**	**STEPPS (Systems Training for Emotional Predictability and Problem Solving)** **(Nancee Blum and Donald Black)**	**A group aimed at accepting emotions** **(Kim Gratz)**	**Good general psychiatric management** **(John Gunderson)**
Background theories	• Emotion theory • Dialectical philosophy • Mindfulness • Cognitive behavioural therapy • Biosocial theory	• Psychodynamic theory of development • Attachment theory • Object relations theory • Cognitive theory	• Cognitive-behavioural theory • Attachment theory • Constructivist theory • Object relations theory • Character psychotherapy (Gestalt)	• Object relations theory	• Cognitive-behavioural theory • Schema therapy • System theory	• Acceptance and commitment therapy • Dialectical behaviour therapy	• Attachment theory • Psychodynamic and behavioural theory • "Common sense"
A core understanding of borderline personality disorder	• Emotion regulation disorder	• Background insecure (often unstructured) attachment relationship withlower ability to mentalize, especially in attachment contexts and in association with strong emotional experiences	• Failure to meet the child's basic emotional needs and respond to them	• Object imagery dominated by the use of splitting as a defence mechanism	• Disorder of emotional intensity and regulation	• Difficulty regulating emotions	• Interpersonal hypersensitivity • Interpersonal attachment problems
Key therapy goals	• Learn to validate self and then	• Promoting and maintaining mentalization in as	• Learn to recognize, accept and express basic emotional	• Integration of loosely integrated part-	• Increasing self-understanding • Identifying early	• Promoting acceptance and adaptive	Therapist acts as a centre of gravity

Table 6. Psychotherapy methods that have been studied in a randomized and controlled manner. Source: Koivisto M. 2020

	Dialectical Behaviour Therapy (Marsha Linehan)	Mentalization Therapy (Anthony Bateman & Peter Fonagy)	Schema Therapy (Jeffrey Young)	Transference-focused therapy (Otto Kernberg, John Clark, and Frank Yeomans)	STEPPS (Systems Training for Emotional Predictability and Problem Solving) (Nancee Blum and Donald Black)	A group aimed at accepting emotions (Kim Gratz)	Good general psychiatric management (John Gunderson)
	others • Learn new coping ability for possible difficult situations • Working towards personal life goals	many contexts as possible • Recognizing feelings and expressing them appropriately to others • Taking personal responsibility and interacting with others	needs • Recognizing schemas and modes, understanding their development and gradual correction of schemas • Survival modes gradually become redundant • Reducing the power and influence of harmful authority modes • Strengthening wise adult mode	object relationships and gradual transition to the world of intact and stable human relationships	maladaptive schemas and other emotional and behavioural triggers • Learning emotion regulation and other skills • Connecting the patient to the network	regulation of emotions • Learning skills that facilitate awareness, understanding and acceptance of emotions • Inhibition of affective behaviour but not emotion	• In handling the patient's real-life interaction relationships • In problematic attachment patterns • In regulating emotions, especially in interactions • In supporting functioning and work ability
Treatment implementation	• Individual psychotherapy (once a week) • Group skills coaching (once a week) • The possibility of telephone consultation	Day hospital model: • Individual psychotherapy (once a week) • Group psychotherapy (thrice a week) • Optional: creative therapy groups • Community meeting (every	• Individual psychotherapy (once or twice a week) • Duration of individual psychotherapy: in studies one and a half to four years, ideally as long as the patient needs	• Individual psychotherapy (twice a week) • Duration of treatment: one to four years in studies	• Psychoeducational group: 20 sessions(weekly) • Alongside the existing treatment	• Educational group: 14 sessions (weekly)	• Regular contact with a psychiatrist or psychologist (weekly) • Psychoeducation about emotional instability for the patient and family • Case management • Family get-togethers

Table 6. Psychotherapy methods that have been studied in a randomized and controlled manner. Source: Koivisto M. 2020

	Dialectical Behaviour Therapy (Marsha Linehan)	Mentalization Therapy (Anthony Bateman & Peter Fonagy)	Schema Therapy (Jeffrey Young)	Transference-focused therapy (Otto Kernberg, John Clark, and Frank Yeomans)	STEPPS (Systems Training for Emotional Predictability and Problem Solving) (Nancee Blum and Donald Black)	A group aimed at accepting emotions (Kim Gratz)	Good general psychiatric management (John Gunderson)
	between meetings • Consultation among the team of therapists • The duration of treatment is one to three years	week) • Monitoring of drug treatment (monthly) • Duration of treatment: one and a half to three years Outpatient model: • Individual psychotherapy (once a week) • Group therapy (once a week) • Telephone support in case of crises • Monitoring of drug treatment • Duration of treatment: one and a half years Can also be offered in hospital conditions	• Also developed group therapy to be offered alongside other treatment: 30 sessions				• Can be combined with various group treatments • Medical treatment if necessary • Duration of treatment: ideally as long as the patient needs

Table 6. Psychotherapy methods that have been studied in a randomized and controlled manner. Source: Koivisto M. 2020

Table 7: Psychotropic medications for the treatment of personality disorders

No	Drugs used in PD	Doses (mg/day)	Indications in PD	Level of evidence	Strength of recommendations
1	Escitalopram	5-20	Impulsivity, anger, affective instability, depression, self-harm, and anxiety symptoms	Level II	Strong
2	Sertraline	50-200	Same as escitalopram *(maybe better tolerated by some individuals)*	Level II	Strong
3	Mirtazapine	7.5-45	Depression, anxiety, and somatic symptoms	Level IV	Weak
4	Lamotrigine	25-275	Affective instability, impulsivity, anger, and aggression	Level II	Weak
5	Topiramate	100-250	Aggression and somatic symptoms (e.g., headache)	Level II	Weak
6	Divalproex	250-1500	Impulsivity, anger, aggression, and substance use	Level II	Weak
7	Olanzapine	2.5-20	Inappropriate anger, impulsivity, paranoid ideation, and dissociative symptoms *(side-effects may lead to poor adherence to treatment in higher doses)*	Level I	Strong
8	Aripiprazole	5-30	Anger, depression, anxiety, and self-harm	Level II	Weak
9	Risperidone	0.5-8	Anger, cognitive inflexibility, paranoid ideation, and affective instability	Level II	Weak
10	Quetiapine	25-600	Sleep disturbance, cognitive inflexibility, paranoid ideation, and affective instability	Level II	Weak

PD: Personality disorder, RCT: Randomised controlled trial, SUD: Substance use disorder

[Level of evidence] **Level I:** *Large RCTs with clear-cut results;* **Level II:** *Small RCTs with unclear results;* **Level III:** *Cohort and case-control studies;* **Level IV:** *Historical cohort or case-control studies;* **Level V:** *Case series, studies with no control.*

[Strength of recommendations] **Strong***: Indicates confidence that the benefits of the intervention clearly outweigh harms;* **Weak:** *Indicates uncertainty (i.e., the balance of benefits and harms is difficult to judge or either the benefits or the harms are unclear).*

Reference:

1. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) [Internet]. 5th ed. Vol. 1. Arlington, VA: American Psychiatric Association; 2013 [cited 2022 Sept 19]. Available from: http://www.psychiatryonline.com/resourceTOC.aspx?resourceID=1

2. World Health Organization. The ICD-10 classification of mental and behavioural disorders: diagnostic criteria for research [Internet]. World Health Organization; 1993 [cited 2022 Sept 19]. Available from: https://apps.who.int/iris/handle/10665/37108

3. Roberts BW, Walton KE, Viechtbauer W. Patterns of mean-level change in personality traits across the life course: a meta-analysis of longitudinal studies. Psychol Bull. 2006;132(1):1–25.

4. Rao S, Heidari P, Broadbear JH. Developments in diagnosis and treatment of people with borderline personality disorder. Curr Opin Psychiatry. 2020;33(5):441–6.

5. McGlashan TH, Grilo CM, Sanislow CA, Ralevski E, Morey LC, Gunderson JG, et al. Two-year prevalence and stability of individual DSM-IV criteria for schizotypal, borderline, avoidant, and obsessive-compulsive personality disorders: toward a hybrid model of axis II disorders. Am J Psychiatry. 2005;162(5):883–9.

6. Skodol AE, Siever LJ, Livesley WJ, Gunderson JG, Pfohl B, Widiger TA. The borderline diagnosis II: biology, genetics, and clinical course. Biol Psychiatry. 2002;51(12):951–63.

7. Soeteman DI, Verheul R, Busschbach JJV. The burden of disease in personality disorders: diagnosis-specific quality of life. J Pers Disord. 2008;22(3):259–68.

8. Huang Y, Kotov R, de Girolamo G, Preti A, Angermeyer M, Benjet C, et al. DSM-IV personality disorders in the WHO World Mental Health Surveys. Br J Psychiatry. 2009;195(1):46–53.

9. Chanen AM, Nicol K, Betts JK, Thompson KN. Diagnosis and Treatment of Borderline Personality Disorder in Young People. Curr Psychiatry Rep. 2020;22(5):25.

10. Zanarini MC, Temes CM, Magni LR, Aguirre BA, Hein KE, Goodman M. Risk Factors for Borderline Personality Disorder in Adolescents. J Pers Disord. 2020;34(Suppl B):17–24.

11. Torgersen S, Kringlen E, Cramer V. The prevalence of personality disorders in a community sample. Arch Gen Psychiatry. 2001;58(6):590–6.

12. Coid J, Yang M, Tyrer P, Roberts A, Ullrich S. Prevalence and correlates of personality disorder in Great Britain. Br J Psychiatry. 2006;188:423–31.

13. Dubovsky AN, Kiefer MM. Borderline personality disorder in the primary care setting. Med Clin North Am. 2014;98(5):1049–64.

14. Coid J, Yang M, Bebbington P, Moran P, Brugha T, Jenkins R, et al. Borderline personality disorder: health service use and social functioning among a national household population. Psychol Med. 2009;39(10):1721–31.

15. Sharan P. An overview of Indian research in personality disorders. Indian J Psychiatry. 2010;52(Suppl 1):S250-254.

16. Gupta S, Mattoo SK. Personality disorders: prevalence and demography at a psychiatric outpatient in North India. Int J Soc Psychiatry. 2012;58(2):146–52.

17. Sen P, Barnicot K, Podder P, Dasgupta I, Gormley M. Exploring the prevalence of personality disorder and the feasibility of using the SAPAS as a screening tool for personality disorder in an emergency department in India. Med Sci Law. 2022;62(1):8–16.

18. Crawford TN, Cohen P, Brook JS. Dramatic-erratic personality disorder symptoms: II. Developmental pathways from early adolescence to adulthood. J Pers Disord. 2001;15(4):336–50.

19. Cohen P, Crawford TN, Johnson JG, Kasen S. The children in the community study of developmental course of personality disorder. J Pers Disord. 2005;19(5):466–86.

20. Lake RI, Eaves LJ, Maes HH, Heath AC, Martin NG. Further evidence against the environmental transmission of individual differences in neuroticism from a collaborative study of 45,850 twins and relatives on two continents. Behav Genet. 2000;30(3):223–33.

21. Winsper C, Wolke D, Lereya T. Prospective associations between prenatal adversities and borderline personality disorder at 11-12 years. Psychol Med. 2015;45(5):1025–37.

22. Bandelow B, Krause J, Wedekind D, Broocks A, Hajak G, Rüther E. Early traumatic life events, parental attitudes, family history, and birth risk factors in patients with borderline personality disorder and healthy controls. Psychiatry Res. 2005;134(2):169–79.

23. Martín-Blanco A, Soler J, Villalta L, Feliu-Soler A, Elices M, Pérez V, et al. Exploring the interaction between childhood maltreatment and temperamental traits on the severity of borderline personality disorder. Compr Psychiatry. 2014;55(2):311–8.

24. Steele KR, Townsend ML, Grenyer BFS. Parenting and personality disorder: An overview and meta-synthesis of systematic reviews. PLoS One. 2019;14(10):e0223038.

25. Porter C, Palmier-Claus J, Branitsky A, Mansell W, Warwick H, Varese F. Childhood adversity and borderline personality disorder: a meta-analysis. Acta Psychiatr Scand. 2020;141(1):6–20.

26. Boutros NN, Torello M, McGlashan TH. Electrophysiological aberrations in borderline personality disorder: state of the evidence. J Neuropsychiatry Clin Neurosci. 2003;15(2):145–54.

27. Soloff PH, Chiappetta L, Mason NS, Becker C, Price JC. Effects of serotonin-2A receptor binding and gender on personality traits and suicidal behavior in borderline personality disorder. Psychiatry Res. 2014;222(3):140–8.

28. Ruocco AC, Amirthavasagam S, Zakzanis KK. Amygdala and hippocampal volume reductions as candidate endophenotypes for borderline personality disorder: a meta-analysis of magnetic resonance imaging studies. Psychiatry Res. 2012;201(3):245–52.

29. Hutchings J, Gardner F, Bywater T, Daley D, Whitaker C, Jones K, et al. Parenting intervention in Sure Start services for children at risk of developing conduct disorder: pragmatic randomised controlled trial. BMJ. 2007;334(7595):678.

30. Sanislow CA, Grilo CM, McGlashan TH. Factor analysis of the DSM-III-R borderline personality disorder criteria in psychiatric inpatients. Am J Psychiatry. 2000;157(10):1629-1633.

31. Zimmerman M, Multach MD, Dalrymple K, Chelminski I. Clinically useful screen for borderline personality disorder in psychiatric out-patients. Br J Psychiatry. 2017;210(2):165-166.

32. Pompili M, Girardi P, Ruberto A, Tatarelli R. Suicide in borderline personality disorder: a meta-analysis. Nord J Psychiatry. 2005;59(5):319-324.

33. American Psychiatric Association Practice Guidelines. Practice guideline for the treatment of patients with borderline personality disorder. American Psychiatric Association. Am J Psychiatry. 2001;158(10 Suppl):1-52.

34. Lieb K, Zanarini MC, Schmahl C, Linehan MM, Bohus M. Borderline personality disorder. Lancet. 2004;364(9432):453-461.

35. Ruocco AC. The neuropsychology of borderline personality disorder: a meta-analysis and review. Psychiatry Res. 2005;137(3):191-202.

36. Choudhary S, Gupta R. Culture and Borderline Personality Disorder in India. Front Psychol. 2020;11:714.

37. Álvarez-Tomás I, Ruiz J, Guilera G, Bados A. Long-term clinical and functional course of borderline personality disorder: A meta-analysis of prospective studies. Eur Psychiatry. 2019;56:75–83.

38. Zanarini MC, Frankenburg FR, Vujanovic AA, Hennen J, Reich DB, Silk KR. Axis II comorbidity of borderline personality disorder: description of 6-year course and prediction to time-to-remission. Acta Psychiatr Scand. 2004;110(6):416–20.

39. Stoffers JM, Völlm BA, Rücker G, Timmer A, Huband N, Lieb K. Psychological therapies for people with borderline personality disorder. Cochrane Database Syst Rev. 2012;(8):CD005652.

40. Leichsenring F, Rabung S, Leibing E. The efficacy of short-term psychodynamic psychotherapy in specific psychiatric disorders: a meta-analysis. Arch Gen Psychiatry. 2004;61(12):1208–16

41. Linehan MM. Skills training manual for treating borderline personality disorder. New York, NY, US: Guilford Press; 1993. xii, 180 p. (Skills training manual for treating borderline personality disorder).

42. Davidson K, Norrie J, Tyrer P, Gumley A, Tata P, Murray H, et al. The effectiveness of cognitive behavior therapy for borderline personality disorder: results from the borderline personality disorder study of cognitive therapy (BOSCOT) trial. J Pers Disord. 2006;20(5):450–65

43. Livesley WJ. Practical management of personality disorder. New York, NY, US: Guilford Press; 2003. xii, 420 p. (Practical management of personality disorder).

44. Bateman A, Fonagy P. Impact of clinical severity on outcomes of mentalisation-based treatment for borderline personality disorder. Br J Psychiatry. 2013;203(3):221–7

45. Doering S, Hörz S, Rentrop M, Fischer-Kern M, Schuster P, Benecke C, et al. Transference-focused psychotherapy v. treatment by community psychotherapists for borderline personality disorder: randomised controlled trial. Br J Psychiatry. 2010;196(5):389–95

46. Blum N, St John D, Pfohl B, Stuart S, McCormick B, Allen J, et al. Systems Training for Emotional Predictability and Problem Solving (STEPPS) for outpatients with borderline personality disorder: a randomized controlled trial and 1-year follow-up. Am J Psychiatry. 2008;165(4):468–78

47. Linehan MM, Comtois KA, Murray AM, Brown MZ, Gallop RJ, Heard HL, et al. Two-year randomized controlled trial and follow-up of dialectical behavior therapy vs therapy by experts for suicidal behaviors and borderline personality disorder. Arch Gen Psychiatry. 2006;63(7):757–66.

48. Leichsenring F, Leibing E. The effectiveness of psychodynamic therapy and cognitive behavior therapy in the treatment of personality disorders: a meta-analysis. Am J Psychiatry. 2003;160(7):1223–32.

49. Huband N, McMurran M, Evans C, Duggan C. Social problem-solving plus psychoeducation for adults with personality disorder: pragmatic randomised controlled trial. Br J Psychiatry. 2007;190:307–13

50. Rachid F. Repetitive Transcranial Magnetic Stimulation in the Treatment of a Difficult to Treat Condition, Borderline Personality Disorder. J Psychiatr Pract. 2019;25(1):14–2.

51. Leichsenring F, Rabung S, Leibing E. The efficacy of short-term psychodynamic psychotherapy in specific psychiatric disorders: a meta-analysis. Arch Gen Psychiatry. 2004;61(12):1208–1.

52. Lieb K, Völlm B, Rücker G, Timmer A, Stoffers JM. Pharmacotherapy for borderline personality disorder: Cochrane systematic review of randomised trials. Br J Psychiatry. 2010;196(1):4–12.

53. Vita A, De Peri L, Sacchetti E. Antipsychotics, antidepressants, anticonvulsants, and placebo on the symptom dimensions of borderline personality disorder: a meta-analysis of randomized controlled and open-label trials. J Clin Psychopharmacol. 2011;31(5):613–24.

54. Ingenhoven TJM, Duivenvoorden HJ. Differential effectiveness of antipsychotics in borderline personality disorder: meta-analyses of placebo-controlled, randomized clinical trials on symptomatic outcome domains. J Clin Psychopharmacol. 2011;31(4):489–96.

55. Stoffers JM, Lieb K. Pharmacotherapy for borderline personality disorder--current evidence and recent trends. Curr Psychiatry Rep. 2015;17(1):534.

Clinical Practice Guidelines on Breaking Bad News

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Introduction

The most commonly used definition of bad news pertaining to medical settings is, "any information, which adversely and seriously affects an individual's view of his or her future." [1] Some of the common examples of bad news in medical settings include – A person is informed that he has tested positive for HIV, the wife is informed that her husband has been diagnosed with Alzheimer's dementia, a patient is told that his lump has been diagnosed as cancer. Thus, bad news is a message which has a negative connotation and has the capability to alter the recipient's hope, mental well-being and upset his lifestyle.

Epidemiology

In a prospective study from India among 100 cancer patients by Gautam and Nijhawan [2] to know whether the diagnosis of cancer should be communicated to patients and relatives, the majority of patients who knew their diagnosis(71 %), wanted to be told the truth. On the other hand, the majority of relatives wanted to know the truth themselves (81 %) without the patients being told (77%). In a study conducted among faculty and residents of Guilan University of Medical Sciences in Iran, only 13.6% of the participants were found to be trained in delivering bad news.[3] Another study comprising 226 Polish patients with cancer reported that the majority of them received the diagnosis in accordance with the steps of the SPIKES protocol [4]

Implications of Breaking Bad News

Breaking bad news is an art wherein the physician has to strike a fine balance between truth and hope and handle the emotional outcomes of the news on the recipients as well. There are ethical and medico-legal implications of breaking bad news which means that withholding vital information in terms of diagnosis and prognosis from the patient on the presumption that he will not be able to "handle" it may not always be justified in terms of patient's autonomy and "right to know". Similarly, insensible pouring out of bad news with disregard for its emotional consequences on the patient may not be good for the mental health of the patient and therapeutic relationship between the patient and the doctor. The way bad news is disclosed to the patient can affect their understanding of the information, satisfaction with care they have received, hope and over and above all, psychological adjustment with the bad news. [5]

What are the Barriers to Breaking Bad News?

Breaking bad news can take a heavy emotional toll on the doctor, he often feels burdened by a negative news and anticipates negative reactions. The common barriers to breaking bad news are presented in Table 1: [6]

Table 1 Common Barriers to Breaking Bad News[6]

1. Uncertainty about the patient's expectations
2. Fear of destroying the patient's hope.
3. Fear of their own inadequacy in the face of uncontrollable disease.
4. Not feeling prepared to manage the patients anticipated emotional reactions.
5. Embarrassment at having previously painted too optimistic a picture for the patient

What are the goals of Breaking Bad News? [7,8]

The basic goals of breaking bad news have been summarized in Table 2.

Table 2 Goals of Breaking Bad News

1. Gathering information from the patient to develop an idea about the patient's level of knowledge and expectations.
2. To provide clear information based on patient's needs and desires.
3. To provide emotional support to handle the impact of the bad news
4. Minimize loneliness and isolation (reassure about non-abandonment)
5. To develop a treatment plan and long-term strategy in collaboration with the patient

Who should Break Bad News?

Bad news should be delivered either by the head of the unit or a senior consultant who is known to the patient and family members. In emergency situations following the absence of treating consultants, a senior member of the nursing staff may have to break bad news.

Dos and Don'ts for Breaking Bad News have been summarized in Table 3[9]

Table 3: Dos and Don'ts for Breaking Bad News

Dos for Breaking Bad News
- Allow for silence as well as emotional reactions
- Give time
- Be sensitive to the non-verbal language
- Document and liaise with the multidisciplinary team
- Use simple language and honest communication
- Ensure privacy and confidentiality
- Listen to what the patient says

Don'ts for Breaking Bad News
- Assuming that you know what concerns the patient
- Make judgmental comments
- Distort the truth
- Keep talking all the time
- Give false reassurance
- Overload with information
- Withhold information

Various protocols for Breaking Bad News:

Across the years, various clinicians have developed separate protocols for delivering bad news. The SPIKES protocol [8] is the oldest and most commonly used worldwide (Table 4). Subsequently, clinicians have modified this protocol to add certain steps which they felt were essential. For example, in 2005, a modified version, P-SPIKES was published[10], where "P" stands for "Preparation" which includes reviewing all information about the patient that needs to be communicated and rehearsing them if necessary. Another criticism of this protocol is that it does not have a step on patient questions and clarifications. Another recent modification, SPwICES [11] includes "w" which deals specifically with "warning shot" and "ICE" involves juggling with providing information, clarifying and dealing with emotions. Other popular protocols include the ABCDE protocol (Table 5) [7] , Kaye's 10-step model[12](Table 6) and BREAKS protocol (Table 7).[13] All these

protocols have traditionally been devised by oncologists. Hence, in subsequent years, other specialists, including surgeons and emergency physicians, have come up with their own modified protocols. The PEWTER protocol (Table 8)[14] has been devised for emergency physicians. Similarly, the SUNBURN protocol (Table 9) [15] has been developed to suit the purpose of trauma and acute care surgeons. A simple step-by-step method has been outlined in Table 10 which incorporates the essential elements of breaking bad news and has been incorporated more or less in every established protocol on breaking bad news. This method is simple and can be easily adopted by all clinicians. Otherwise, any of SPIKES, ABCDE, Kaye's Model or BRAKES protocol may be used.

Table 4. The SPIKES Protocol [8]

1. **Setting up the interview-**
   • Arrange for some privacy
   • Involve significant others as per the patient's choice
   • Sit down
   • Make connection with the patient: maintain eye contact and/or touch the patient (if he /she is comfortable with you doing so
   • Manage time constraints and interruptions
2. **Assess the patient's perception**
   • Determine what the patient knows about the medical condition or what he (she) suspects
   • Listen to the patient's level of comprehension
   • Determine if the patient is engaging in illness denial
3. **Obtain the patient's invitation**
   • Ask the patient if he (she) wishes to know the details of the medical condition and/or treatment • Accept the patient's right not to know
   • Offer to answer questions later if he (she) wishes
4. **Give knowledge and information**
   • Warn the patient that bad news is coming; this may lessen the shock that can follow the disclosure of bad news
   • Start at the patient's level of comprehension and vocabulary
   • Use non-technical words

- Avoid excessive bluntness
- Give information in small chunks, and periodically check the patient's understanding
- Avoid using phrases such as "There is nothing more we can do for you"

5. **Address the patient's emotions with empathic responses**
   - Observe for any emotion on the part of the patient
   - Identify the emotion experienced by the patient by naming it to oneself
   - Identify the reason for the emotion
   - Let the patient know you have connected the emotion with the reason for the emotion by making a connecting statement

6. **Strategy and Summary**
   - Summarize the information you have provided.
     - If the patient is ready, discuss the treatment plan
   - Sharing responsibility for decision making
   - Check patient's understanding/misunderstanding of the discussion

Table 5. The ABCDE Protocol [7]

Advance preparation
Ask what the patient already knows and understands.
What is his or her coping style?
Arrange for the presence of a support person and appropriate family
Arrange a time and place that will be undisturbed (hand off beeper)
Prepare emotionally
Decide which words and phrases to use (write down a script)
Practice delivering the news
Build a therapeutic environment/relationship
Arrange a private, quiet place without interruptions
Provide adequate seating for all
Sit close enough to touch if appropriate
Reassure about pain, suffering, abandonment
Communicate well
Be direct ("I am sorry, have bad news")
Do not use euphemisms, jargon, acronyms Say "cancer" or "death"
Allow for silence
Use touch appropriately
Ask patient to repeat his or her understanding of the news
Arrange additional meetings
Use repetition and written explanations or reminders

Deal with patient and family reactions
 Assess patient reaction
* physiologic responses: flight/fight, conservation/withdrawal
* cognitive coping strategies: denial, blame, intellectualization, disbelief, acceptance
* affective responses: anger/rage, fear/terror, anxiety, helplessness, hopelessness, shame, relief, guilt, sadness, anticipatory grief
Listen actively, explore feelings, express empathy
Encourage and validate emotions (reflect back emotions)
Correct distortions
Offer to tell others on behalf of the patient
Evaluate the effects of the news
Explore what the news means to the patient
Address further needs, determine the patient's immediate and near-term plans, assess suicidality Make appropriate referrals for more support
Provide written materials
Arrange follow-up
Process your own feelings

Table 6. Kaye's 10 Step Model[12]

1.Prepare
• Know all the facts
 • Ensure privacy
• Find out who the patient would like present
 • Introduce yourself
2.Determine what the patient knows
• Start with open-ended questions (eg,"How did it all start?")
3.Determine if more information is wanted
• Do not force information on to the patient (eg, "Would you like me to explain a bit more?")
4. Give warning shots
 • Not straight out with it! (ie, "I'm afraid it looks rather serious")
6.Allow patient to refuse information at that time
• Denial is a defense mechanism and a way of coping
• Allow the patient to control the amount of information he (she) receives
6.Explain if requested
   • Go step by step
   • Details might not be remembered, but the way you explain them will be
7.Listen to concerns
• Ask "What are your concerns at the moment?"
• Allow time and space for answers
8. Encourage feelings
 • Acknowledge the feelings
• Be nonjudgmental
 9. Summarize
• Review concerns, plans for treatment
• Foster hope
 • Offer written information if asked
10. Follow up
• Offer further information
• Assure patient of your continued availability

Table 7. BREAKS Protocol [13]

Background
An in-depth study on the patient's disease status, emotional status, coping skills, educational level, and support system is done before attempting to break the bad news
Rapport
Building rapport is essential. Physician should have an unconditional positive regard. Present condition should be probed through open -ended questions.
Explore
It is always preferable for the physician to start with what the patient knows about his/her

illness
Announce
A warning shot is desirable
Give the information in short, comprehensible sentences
It is always desirable not to give more than three pieces of information at one go
Kindling
Allow adequate space for free flow of emotions
Ensure that the patient/relatives did not misunderstand the gravity of the disease
Summarize
Physician has to summarize the session and discuss the treatment plan

Table 8. PEWTER Model [14]

P: Preparing the one giving the news through education and training, and preparing the setting and the approach for giving the news
E: Evaluating what the listener already knows
W: Warning by making a brief statement followed by a moment of silence to prepare the listener for the bad news that comes next
T: Telling the news
E: Emotional response: paying attention to and responding appropriately to the listener's emotional responses
R: Regrouping by helping the listener move forward with the next steps

Table 9. SUNBURN Protocol[15]

S–Set Up
U–Understand Perceptions
N–Notify ('Warning Shot')
B–Brief Narrative and Break Bad News
U–Understand Emotions
 R–Respond
 N–Next Steps

Table 10. Simple Step by Step Protocol for Communicating Bad News[16]

1. **Prepare for the encounter**
   - If possible, have advance discussion with patient about who will be present
   - Find a location with adequate privacy
   - Arrange adequate time for discussion
   - Review the clinical information
2. **Assess the patient's understanding**
   - Ask the patient about his or her view of the situation
   - Find out how much that patient wants to
3. **Disclose the news**
   - Consider giving a "warning shot"
   - Provide information honestly and in simple language
   - Tailor amount of medical details and technical language in accord with patient's wishes
4. **Respond to the patient's emotions**
   - Encourage the patient to express his or her emotions
   - Acknowledge the patient's emotions and empathize concerns at this point
   - Tolerate silence
5. **Offer to discuss implications of the news, including**
   - Prognosis
   - Treatment options
   - Effect on quality of life
6. **Offer additional resources, including**:
   - Assistance talking to others
   - Other support services
7. **Summarize the discussion**
   - Restate important points
   - Ask if there are any other questions
8. **Arrange a follow-up time for patient and family questions and concerns**

9. **Document the discussion in the medical record**

Documentation

This is of utmost importance after breaking bad news that the accurate details of the conversation and information and details exchanged are maintained. This record should be documented in the patient's notes. The specific words used to describe the disease should be recorded. Apart from the socio-demographic details, clinical diagnosis, clinical options for future management and immediate plan discussed and detail of the words used when breaking the bad news- these three points must be clearly noted. Maintaining accurate records will help in future care of the patient and communication with the multidisciplinary team.

Breaking Bad News over telephone[17]

While it is generally advised to break bad news through face-to-face interactions, the exceptional challenge posed by the pandemic forced all nations to make newer adjustments, including breaking bad news over telephone. Things to be kept in mind during phone call:

Tone & Pitch

- Ensure your tone captures the seriousness of what you are telling the patient

- Note the patient's tone and pitch as that may indicate how the patient is feeling

Language

- Use "we" or " the team" as opposed to "I", to help them to feel like the family member is managed by a team.

- Keep it simple and use clear, direct language. A patient's emotional state will limit the complexity of the information that they can process.

Understanding

- Always check that the patient and carer/relative have understood what you have told them.

- Give them time and a chance to ask any questions.

- When preparing to give the news, establish where the recipient of the phone call is, whether they can have an uninterrupted conversation, and whether they have anyone with them for support. Empathetic expression and tone of voice is emphasized, as is the use of silence.

  Finally, gender, race, ethnicity, sexual orientation, disability, social class and religion of the person are to be kept in mind while addressing the person.

Role of Psychiatrists in Breaking Bad News

Many physicians consider that psychiatrists are best suited for breaking bad news since they are better in handling emotions as well as more effective in communication skills. The role of a psychiatrist becomes much more important in a consultation liaison set up in this respect. Breaking bad news can be encountered by psychiatrists themselves while disclosing the diagnosis and prognosis of disorders like dementia, intellectual disability and autistic spectrum disorder. There are many similarities between medical and psychiatric settings in terms of breaking bad news (Table 8). However, certain issues may create roadblocks like the patient's understanding of the information being conveyed which may be affected by existing psychopathology or cognitive deficits and the long-term consequences of stigma associated with mental illness. Psychiatrists should play a leading role in teaching communication skills and skills in breaking bad news to their fellow colleagues in other disciplines.

Table 11. Similarities in Breaking Bad News in Medical and Psychiatric Settings [19]

The patient has the moral and legal right to accurate information.
The clinician's primary responsibility is to the patient.

The setting should be private and free from interruptions.

One practitioner should be responsible for imparting the "bad" news.

Determine what the patient knows and understands about his or her situation.

Respond to the reactions to the news—listen sensitively, validate, and support.

The diagnosis should be conveyed as soon as it is determined.

Provide information clearly in segments, and check for understanding.

Avoid offering prognoses with specific time projections.

Ascertain whether the patient (or family, if present) wishes to hear more details.

When there are no further questions, plan the next few practical steps.

Breaking Bad News to patients with psychiatric conditions: A proposed model

Certain psychiatric diagnoses, particularly schizophrenia, involves many complex issues while conveying the diagnosis to the patient and significant others. The patients lack insight and cognitive capacity, especially during the initial phase of the illness, which may interfere with their ability to understand the diagnosis and long-term treatment implications. Keeping in mind all these complexities, the psychiatrists have a tendency to withhold information related to diagnosis.[16] One study examining the implementation of SPIKES protocol in breaking bad news to patients with schizophrenia [20] found that rates of implementation of this protocol were very low among psychiatrists despite studies showing that psychiatric patients want to know and should be informed about the diagnosis. The authors concluded that SPIKES protocol is applicable for breaking bad news to patients with schizophrenia though the role of family while breaking the news and during shared decision making was emphasized.[20] We propose a protocol suitable for breaking bad news to patients and their significant others regarding psychiatric diagnoses-especially severe mental illnesses like schizophrenia and bipolar disorder **(Table 12)**. The model is derived from all essential elements that

are common to various protocols for breaking bad news. Since families are an essential part of breaking bad news in context of psychiatric diagnoses, involvement and role of family members and significant others has been specifically emphasized in a separate step. The steps can be easily remembered by the acronym- **ASKS WIVES.**

Table 12. The Proposed Model for Breaking Bad News to patients with Psychiatric Diagnosis (ASKS WIVES)

1. **Adequate preparation**
2. **Setting of the interview with adequate privacy**
3. **Assess the level of Knowledge and understanding**
4. **Involve Significant others and assess their background knowledge too**
5. **Warning shot**
6. **Information regarding the illness**
7. **Encourage Ventilation of emotions and deal with emotional reactions**
8. **Explain all possible implications as per queries in detail**
9. **Summarize the discussion, arrange a follow-up meeting and document everything**

REFERENCES

1. Buckman R. (1992) Breaking Bad News: A Guide for Health Care Professionals. Baltimore: Johns Hopkins University Press.
2. Gautam S, Nijhawan M. Communicating with Cancer Patients. British Journal of Psychiatry 1987;150: 760- 764
3. Biazar G , Delpasand K , Farzi F , Sedighinejad A , Mirmansouri A , Atrkarroushan Z. Breaking Bad News: A Valid Concern among Clinicians . Iran J Psychiatry 2019; 14: 3: 198-202
4. Marschollek P, Bąkowska K, Bąkowski W, et al. Oncologists and breaking bad news—From the informed patients' point of view. The evaluation of the SPIKES protocol implementation. J Cancer Educ 2018; 1-6.
5. Butow PN, Dunn SM, Tattersall MH. Communication with cancer patients: does it matter? J Palliat Care 1995;11:34-38.
6. Taylor C (1988) Telling Bad News: Physicians and the Disclosure of Undesirable Information. Social Health Illn 10:120-132

7. Rabow MW, McPhee SJ. Beyond breaking bad news: how to help patients who suffer .WJM. Volume 171; 1999: 260-263

8. Walter F, Baile WF, Buckman R, Lenzi R, Glober G, Beale EA, et al. SPIKES—A Six-Step Protocol for Delivering Bad News: Application to the Patient with Cancer. The Oncologist 2000;5:302-311

9. End-of-Life Care Resource Folder Version 1, p-1-27, Irish foundation, http://hospicefoundation.ie/wp-content/uploads/2013/04/4.Communication.pdf accessed on 15.06.2022

10. Buckman, R. A. . "Breaking Bad News: The S-P-I-K-E-S Strategy," Psychosocial Oncology, 2005;2 :138-142.

11. : Meitar D, Karnieli-Miller O. Twelve tips to manage a breaking bad news process: Using S-P-w-ICE-S—a revised version of the SPIKES protocol. Med Teach. 2021; 30:1-5

12. Kaye P. Breaking bad news: a 10 step approach. Northampton, MA: EPL Publications; 1995.

13. Narayanan V, Bista B, Koshy C. "BREAKS" Protocol for Breaking Bad News. Indian J Palliat Care. 2010 May-Aug; 16: 61–65.

14. Nardi, T. J. & Keefe-Cooperman, K. "Communicating Bad News: A Model for Emergency Mental Health Helpers," International Journal of Emergency Mental Health, 8; 203-207

15. Velez D, Geberding A, Ahmeti M. Trauma Surg Acute Care Open 2022;7:e000851.

16. Lee, S. J., Back, A. L., Block, S. D. & Stewart, S. K. (2002). "Enhancing Physician-Patient Communication," Hematology American Society Hematology Education Program, 2002 (1) 464-83.

17. Collini A, Parker H, Oliver A. Emerg Med J 2021;38:151–154.

18. Buckman R, Baile W. Truth telling: yes, but how? J Clin Oncol 2007;25:3181.

19. Mitchell AJ. Reluctance to disclose difficult diagnoses: A narrative review comparing communication by psychiatrists and oncologists. Supportive Care Cancer 2007; 15:819-828

20. Amsalem D, Hasson-Ohayon I, Roe D, Gothelf D. The SPIKES Protocol is Not Applied in the Process of Breaking Bad News to Patients with Schizophrenia. Isr J Psychiatry 2019; 56: 28-32

Clinical Practice Guidelines for assessment and management of psychiatric morbidity and substance use disorders in Medical Professionals

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Clinical Practice Guidelines for assessment and management of psychiatric morbidity and substance use disorders in Medical Professionals

Introduction

The medical career and profession are considered to be one of the most stressful professions. Evidence suggests that stress in the life of medical professionals starts before joining the medical college, from the time of preparation for the entrance examination, and continues throughout life. To succeed during medical school and residency training and later in practice, they are expected to balance various demands, including pressures to constantly imbibe new knowledge and skills, meet the deadlines for various activities, and handle the workload. The association of stress with various mental illness is well known. Accordingly, medical students, residents, and practicing physicians have a higher prevalence of mental disorders. Data is mainly available for depression, burnout, substance use disorders, sleep disturbances, and suicide. Despite the high prevalence of mental disorders among medical students, residents, and practicing physicians, they are often reluctant to seek mental health services. They also have a lot of apprehensions about the use of psychotropics. Hence, mental health professionals need to understand these barriers, provide quality care to the medical professionals seeking help, and create a friendly environment to improve the rates of seeking help.

This group of clients are often ambivalent about seeking a psychiatric consultation and contact the psychiatry emergency services (such as crisis helpline) or services at the student welfare centres, and seek urgent help. They often contact the psychiatric services, when they are not able to manage their issues on their own and expect that the mental health professionals will be able to help them on an urgent and priority basis. This guideline provides a broad framework for the assessment, management, and prevention of mental health issues among medical professionals. The health care needs of the medical students, residents, physicians, and other medical professionals such as nurses and paramedical staff can vary. These guidelines are not framed keeping any specific setting or model of psychiatric care and will require modifications to suit the needs of patients, service model, and precise setting. Similarly, these guidelines do not provide recommendations for any specific psychiatric disorder in medical professionals. Instead, it gives a general outline of how to address issues specific to this group of patients. In this guideline, the term "doctor-

patient client" refers to all groups of health professionals, such as medical students, resident doctors, and practicing doctors.

Epidemiology of mental health issues among the physicians

Data from all parts of the globe suggest a high prevalence of mental disorders among health care professionals compared to the general population.

Depression:

A metanalysis of the data on medical students suggests that the prevalence of depression or depressive symptoms is 27.2%. The longitudinal studies assessing depressive symptoms before joining the medical schools and during the medical course suggest an increase in the prevalence of depressive symptoms by 13.5% during undergraduate medical training[1].A meta-analysis that included data on resident physicians estimated the pooled prevalence of depression or depressive symptoms to be 28.8% [95% confidence interval (CI): 25.3%-32.5%]. The metanalysis also suggested that over the years, there has been an increase in the prevalence of depression with the increasing calendar year, and secondary analysis of the data indicated an increase in depressive symptoms by 15.8% after starting residency [2]. Another meta-analysis of data from Australia estimated the prevalence of depression to be 27% among medical students, 29% among registrars, and 60% among doctors in practice [3]. The data that has emerged from various countries during the COVID-19 pandemic has estimated the prevalence of depression among physicians to be 26% [4]. A meta-analysis of data on nursing students estimated the prevalence of depression to be 34%, with a higher prevalence among those of Asian origin[5]. The prevalence of depressive symptoms in nurses has been estimated to range from 12% to 43.3% [6,7].

Available data suggest that depressive symptoms are associated with an increased relative riskof medical errors. Data also indicates that committing medical errors is also associated with an increased risk of depression[8]. Depressive symptoms and depression among physicians are associated with reduced work productivity, lower work satisfaction, higher rates of dysfunctional and worrisome approaches to seeking mental health services, and self-prescription of antidepressants[9].

Metanalysis of the data from India suggests that the prevalence of depression among medical students is40% (CI: 32%–47%), with a significantly higher prevalence among girls [10].A meta-analysis of studies conducted during the COVID-19 pandemic has estimated the

prevalence of depression among physicians to be 41.9% [4], and that in nurses has been estimated to range from 35.8%-70%[11,12](Table-1).

Suicidal ideations and suicide: The Prevalence of suicidal ideation is estimated to be 11.1% among medical students [1]and 17% among physicians[13].Further, the data also suggest that suicide rates are higher among physicians and health care workers compared to the general population. A recent meta-analysis estimated that the standardized mortality rate for suicide among physicians to be 1.44 (95% confidence interval: 1.16, 1.72) when compared to general population, with a higher risk among females compared to males. In terms of specialty, anesthesiologists, psychiatrists, general practitioners, and general surgeons are at higher risk [13]. A study from India estimated the prevalence of suicidal ideations among medical students to be 53.6%[14].A study assessed the prevalence of suicidal ideations to be 16.7% among resident doctors and faculty members in a tertiary care hospital [15].

Burnout:

The concept of physician burnout emerged during the 1960s. It is defined as *"a persistent, negative, work-related state of mind in 'normal' individuals primarily characterized by exhaustion, which is accompanied by distress, a sense of reduced effectiveness, decreased motivation, and the development of dysfunctional attitudes and behaviors at work."*[16]. It is considered to have three subcomponents, i.e., emotional exhaustion, depersonalization, and a sense of low accomplishment [17]. Different metanalysis suggests that there is a high prevalence of burnout among medical students (44.2%) [18], residents (35.7%)[19], physician (67%)[20] and nurses (11.23%) [21].Emerging data from the United States also suggest that over the period (from 2011 to 2014), there has been an increase in the prevalence of symptoms of burnout among physicians, with a reduction in the satisfaction with work-life balance[22].The risk factors for burnout among medical students include the curriculum, stress arising due to competition, examinations, finances involved in pursuing the studies, hospital conditions with the workload, exposure to patients' suffering and death, management style, and young age[18]. Among the residents, high burnout rates are reported for general surgery, anesthesiology, obstetrics and gynecology, and orthopedics compared to other specialties [19].Available data also suggest a high correlation between depression and burnout [23,24] and burnout and anxiety [24]. A meta-analysis of data suggests that burnout among professionals (not limited to medical professionals) is a significant predictor

of hypercholesterolemia, type 2 diabetes, coronary heart disease, hospitalization due to cardiovascular disorder, musculoskeletal pain, changes in pain experiences, prolonged fatigue, headaches, gastrointestinal issues, respiratory problems, severe injuries and mortality below the age of 45 years. Similarly, burnout is also significantly associated with adverse psychological consequences, including insomnia, depressive symptoms, psychotropic and antidepressant medications, hospitalization for mental disorders, and psychological ill-health symptoms. Burnout has also been associated with adverse professional outcomes such as job dissatisfaction, absenteeism, new disability pension, perception of high job demands, and presenteeism [25].

Various studies have estimated the prevalence of burnout among medical students to range from 16%- 80%[26,27], 27.13%-90% among the residents/registrars and physicians [28,29], and 37.6% among nurses[30]. A metanalysis, which included data from 15 studies from India that included doctors, nurses, resident doctors, paramedics, and physiotherapists, estimated the prevalence of emotional exhaustion to be 24% (95% CI: 16 − 36%), and that of depersonalization to be 27% (95% CI: 15–44%), and 23% (95% CI: 11– 42%) for burnout in the domain of personal accomplishment[31]. This review also showed that the prevalence of burnout was higher among females, those who were unmarried, and those who had long working hours.The prevalence was also higherin those with higher professional dissatisfaction, perceived stress, low remuneration, lack of time for leisure activities, disturbed sleep-wake cycle, and lack of respect at work[31].

Anxiety: The prevalence rate among medical students has been reported to be 33.8% (95% CI: 29.2–38.7%), with a higher prevalence in students from the Middle East and Asia [32]. A large amount of data has emerged after the COVID-19 pandemic, and this suggests a high prevalence of anxiety among physicians (25.8%) and nurses (37%) [4]. A meta-analysis of studies from India among medical students suggests that anxiety prevalenceis34.5%[33]. Similarly, few cross-sectional studies have reported around 40 to 74% prevalence of anxiety in nurses [11]. During the COVID-19 pandemic, anxiety among physicians has been reported to be 42.8% a metanalysis[4].

Insomnia: The Prevalence of insomnia in medical students has been reported to be around 32%, which is relatively high [34]. Systematic review and meta-analyses on the global prevalence of insomnia in physicians and nurses are lacking. However, the metanalysis of studies that emerged during the COVID-19 pandemic evaluating insomnia in doctors and

nurses has reported the prevalence of insomnia to be 41.6%, 27%, and 34.8% among doctors, nursing students, and nurses, respectively[35]. The Indian studies evaluating insomnia in medical students and doctors report a prevalence of about 17.3%[36]. Metanalysis of data emerging during the COVID-19 pandemic suggests that insomnia prevalence is 31.9%[35]. Similarly, studies on nursing professionals from India report a high prevalence of shift work sleep disorders and poor sleep quality[37,38].

Substance abuse: The worldwide prevalence of substance abuse in medical students has been estimated to range from 20 to 40% [39], and the same in nursing students is 14 to 27.3% [40,41]. Among physicians and nurses, the prevalence of substance use is almost similar to the general population, i.e.,10-15% worldwide[42,43].

A meta-analysis of studies from India suggests the prevalence of substance abuse in medical students to be around 40.3%[44]. Limited data on the prevalence of substance abuse in physicians suggest that it may be about 10%[45].

Table-1: Prevalence of Mental Health Outcomes in health care professionals as reported in different metanalysis

Psychiatric disorders	Medical students	Residents/ Registrars	Physicians	Nursing students	Nurses
Worldwide Data					
Depression or depressive symptoms	27.2%[#]	28.8%[#]	60%[#] 26%[##]	34%[#] 52%[##]	12-43.3%[#]
Suicidal ideations	11.1%[#]	-	17%[#]	-	-
Burnout	44.2%[#]	35.7%[#]	67%[#]	-	11.23%[#]
Anxiety Disorders	33.8%[#] 28%[##]	-	25.8%[##]	32%[##]	37%[##]
Insomnia	55%[#]	-	41.6%[##]	27%[##]	34.8%[##]
Substance abuse	20-40%[$]	-	10-15%[$]	14-27.3%[##]	10%)[#]
Data from India					
Depression or depressive symptoms	40%[#]	-	41.9%[##]	-	35.8%-70%[$$]
Suicidal ideations	53.6%[$$]	-	-	-	-
Burnout	16%- 80% [$$]	27.13% [$$]	24%-EE[#] 27%- DP[#] 23%-PA[#]		37.6% [$$]
Anxiety Disorders	34.5%[#]	-	42.87[##]		40-74%[$$]
Insomnia	17.3% [$$]	-	31.9%[##]	-	43%- 83%[$$]
Substance abuse	40.3%[#]	-	10%[#]	-	-

Data from metanalysis[1,10,21,23,31,32,32,33,33,35,44]; ## Data from metanalysis done on data emerging during the COVID-19 pandemic[4,35,46]; $- data for review[15,33,42] $$- Prevalence studies[12,36–38]

EE-Emotional exhaustion; DP: Depersonalization; PA; Personal Accomplishment

Epidemiological data for other psychiatric disorders is lacking for the health care professionals. However, it must be remembered that they can suffer from any mental disorder, as encountered in people from general population.

Barriers to Seeking Mental Health Care among Physicians

Despite the high level of mental morbidity among medical professionals, they do not seek treatment. Data suggests that 50% of female doctors who meet the criteria for a mental disorder do not seek professional help[47]. Among the various barriers, stigma is one of the crucial barriers preventing doctor-patient client from seeking help, which is more among younger practitioners than older practitioners. The young practitioners also report a higher level of barriers in the form of confidentiality and impact on career progression and registration [48]. The reluctance to seek help has also been reported to be associated with stigma related to mental illnesses, fear related to licensing issues, wanting to solve the problem on their own, fear of colleagues coming to know about the same, lack of time, lack of convenient access, issues related to confidentiality [49–52]. A review of 33 articles identified the following as the most common barriers to seeking mental health care among medical students: fear of the negative effect on residency/career opportunities, apprehension about the breach in confidentiality, stigma, and fear of shaming from peers, lack of perceived seriousness/normalization of symptoms, lack of time, and fear of documentation on academic record (Table-2). Students also preferred to seek care outside of their institution for fear of the provider being an academic preceptor[53].The experience of students who seek help for mental health issues also suggests that they are negatively judged by their supervisors and peers, revealing their emotional/mental health problems to others [54].

One of the studies from India evaluated the barriers in health care seeking among medical students and reported that about one-third of the participants said barriers to seeking mental health services. The commonly reported barriers included lack of confidentiality (61.2%), fear of unwanted interventions (56.4%), unsure about where to seek help (50.3%), stigma (45.8%), lack of time (40.1%), fear of the impact on the academic performance (38.8%), fear of side effects (30.2%) and cost of treatment (11.5%). When the barriers to help-seeking for mental and physical health were compared, a significantly higher proportion of students reported stigma, confidentiality issues, lack of awareness about where to seek help, and fear of unwanted intervention to be more common barriers to seeking mental healthcare services [55].When the barriers to help-seeking were compared between those in the first year and final year, students of the first year more often reported lack of

time, awareness about where to seek help, cost issues, and fear of future academic jeopardy as common barriers. In contrast, final-year students reported stigma as a barrier to seeking help for mental health issues[56].Another study evaluated the barrier to seeking help among the medical residents and faculty reported that only 13% of the participants had sought help from mental health professionals for their work-related stress, and the commonly identified barriers to seeking help included fear of being stigmatized and labeled as 'weak' and having a mental illness, fear of being accused of shrugging work, fear of the impact of seeking help on the attitude of faculty towards them and time constraints to seek help [28].

All these barriers must be considered while dealing with doctor-patient clients. The mental health professionals should remember that those consulting them may still be apprehensive about these issues. They should discuss the relevant issues with the help-seekers to relieve some of their anxiety.

Table-2: Barriers to help-seeking among doctor-patient clients[Adapted from [15,53,57]]

Individual level Barriers	System level Barriers
Medical Professionals & Interns	
• Perceived structural stigma (fear that they may not be accepted onto a specific training program) • Perceived stigma (that others would think less of them) • Self-stigma (that one should be able to cope without the help of others) • Lack of time and prioritizations • Recognition and awareness of stress symptoms • Treatment attitudes and expectations • Preference for self-management • Concerns about the cost of treatment • The belief that treatment does not work	• Lack of access to care: access to services that are anonymous or not related to the individual's immediate work or professional networks • Lack of convenient access • The professional culture of considering high levels of stress either a necessity of the occupation or indicative of effort or commitment • Concerns regarding confidentiality • Negative impact on career
Medical Students	
• Personal stigma against seeking care • Apprehension about non-confidentiality • Fear of mental healthcare being noted on academic record • Fears of decreased opportunities for residency and career • Fear of discrimination/judgment • Lack of time to seek care • Concerns about effectiveness/ appropriateness of treatment • A belief that the issue may self-resolve/is not	• Affiliation of treating practitioner with university • Involvement of practitioner in medical training • Access issues • Cost • Limitation in a number of sessions • Mandatory reporting laws • Lack of education on resources • Lack of available resources

severe enough to seek care • Normalization of symptoms • Previous experience with mental illness in close contacts • Lack of experience with mental illness in close contacts • Lack of knowledge of resources • Preference for mental support from family, friends, peers • Competition with peers • Self-diagnosis • Diagnosed mental illness or high severity of symptoms • Fear of unwanted intervention • Fear of treatment side effects • Lack of positive mentorship	• Cultural stigma

Basics of Organizing Services

It is often said that doctors make the worst patients [58]. Taking care of doctors requires extra time and effort [59]. As pointed out, medical students and physicians have multiple barriers to seeking mental health care. Further, certain other behaviors make them complex patients (Table-3). Some of these clients come with behavior akin to "VIP syndrome," which is understood as a demanding patient resulting in an unsound clinical judgment on the part of the treating clinician to meet the unrealistic expectations of the demanding patients leading to deleterious outcomes[60]. These facts must be kept in mind while evaluating a medical student or a physician, and the clinician should try to be objective in the patient's best interest.

Some of the basic etiquettes should be kept in mind. The general principle includes attending to them on priority. Physicians contacting mental health services should be treated as a priority and, if possible, at a mutually agreed convenience. It is better to organize the services to cater to the need of this group of patients (Table-4). One of the crucial issues is the ease of managing such patients on the part of the psychiatrist, as many of the physicians seeking help may be known to the psychiatrist or may be closely associated with them. If the psychiatrist feels uncomfortable managing a particular client, it is better to refer the physician-client to another psychiatrist after a discussion about the issue.

Confidentiality is an issue for this group of clients. It is always better to be aware of the institutional policies regarding disclosure and non-disclosure about the students. In the institutional setting, the mental health professionals employed in the same institute may be required to inform the

administration about the mental health issues the students/staff face. This kind of provision can have pros and cons, as some persons who are not suicidal/severely ill might find this to be unnecessary. An effort must be made to explain to the clients about the provisions, and who would be informed, as this often helps to alleviate the anxiety. The clinician can inform the doctor-patient client that in case as a treating psychiatrists they feel that the doctor-patient client can be a threat to their own life and to others (including the patients whom they are treating), the confidentiality would be broken in the larger interest of the doctor-patient client. However, if the medical student, resident or physician contacts a psychiatrist outside their institute, they are not required to inform the administration.

Concerning confidentiality, the treating psychiatrist should be clear upfront concerning what would be disclosed to whom and when (for example, when the person seeking help is suicidal and there is a need to monitor the person with the help of family or other staff/colleagues). Whenever feasible and felt appropriate, the person seeking help should be encouraged to inform their family about the mental health status, who can get involved and provide the desired social support and supervision.

Many medical students, residents, and physicians self-medicate and often try to validate the prescription from the psychiatrist when they come across them in a social situation. Similarly, some people seek formal professional help once and then try to maintain informal contact. These behaviors should be discouraged, and regular formal consultations should be encouraged if the symptoms persist. At times, the doctor-patient clients, especially residents seek informal help from their fellow collegues pursuing residency in psychiatry. In general, the residents pursuing psychiatry training should be discouraged to provide informal consultations, as these does not occur in a proper therapeutic situation and at times could land them in trouble, if the doctor-patient client exhibits a suicidal behaviour.

In an institutional setting, services are often organized as a student welfare center/service and/or crisis helpline. The students can contact these services in their time of need and get help. In an institutional setting, when the medical students and residents seek help, they are sometimes assessed in detail and managed by the trainee residents. In such a situation, the consultant or the first point of contact should ask about the preference of the student/resident about the resident with whom they would be more comfortable, and this should take into account the – gender of the treating trainee, place of residence of the treating trainee, the language the trainee can speak, the seniority of the treating trainee, etc.

In institutional setting, at times a psychiatrist may be asked by the administration to evaluate a doctor-patient client due to the disciplinary issues. In such a situation, the doctor-patient client should be initially evaluated by a relatively senior psychiatrist (a faculty member and not a resident),

who after initial evaluation can decide about the course of treatment. When a doctor-patient client is referred by administration, has a diagnosable mental illness and is willing for treatment, the clinician can inform the administration (with due consent from the client) about the mental health issue and provide treatment as per the need. However, if the mental health professional feel that the disciplinary issue is related to personality traits, or are arising due to the inability of the client to fit into their role due to interpersonal clashes with collegues, it is always better to request for formation of a medical board. If the administration is expecting the psychiatrist to make any recommendations beyond treatment, then it is always better to ask for constitution of a multidisciplinary medical board, rather than making recommendation on your own.

In case a doctor patient client is referred by the administration for a mental health issue and the doctor-patient client or their family is unwilling for psychiatric consultation, the psychiatrist can inform the administration about the same and should not coerce them for treatment. However, depending on the doctor-patient client, the psychiatrist should make all efforts to counsel the doctor-patient client and their family members about their impression about the mental health issues, need for treatment and the possibly consequences, if the treatment is not started. They should also inform the doctor-patient client and their family members that in case at any time they decide to seek treatment, they can contact them.

Table-3: Some of the issues to be kept in mind while detailing with doctor-patient clients as persons with mental health issues

- The stigma associated with mental illnesses
- Stigma leading to poor help-seeking- fear of being found by other colleagues/ their patients in the clinic of the mental health professional, fear of loss of privacy and confidentiality
- VIP Syndrome
- Self-diagnosis and reluctant about full-disclosure
- Unable to accept the patient role
- Under-estimation or over-estimation of the symptoms and severity of the illness
- Cutting corners when the history is being collected or attempts are made for detailed physical and mental status examination
- Poor medication adherence
- Reluctance to disclose the illness to close family members or other available support groups
- Poor follow-up rates

Table-4: Organizing services and principles of dealing with doctor-patient clients as persons seeking help for mental health issues

- Decide whether you are comfortable seeing such a client
- Assess for yourself- whether you would be able to maintain a doctor-patient relationship with

- your colleague
- Try to schedule the appointment: mutually agreed time, be flexible in accommodating the colleague
- Discuss the issues of fee structure
- Have sufficient time in hand
- Allay the anxiety
- Request the colleague to come with a reliable informant, if feasible
- In case of a crisis call- try to accommodate and attend at the earliest
- Emphasize the need to maintain a doctor-patient relationship
- Don't get swayed by the stature of the colleague in the city or the institute
- In case a medical student or resident is to be assigned to a trainee psychiatrist- discuss the issue with the patient, take into account their wishes about whom to avoid
- Address the anxiety related to confidentiality, situations in which confidentiality would be broken (while working in an institutional setting- when and to whom)
- Clarify the treatment process- duration of treatment
- Clarify- which of their demands could be accommodated and which cannot be accommodated
- Telepsychiatry services and/or hybrid services: Keeping the time issue and confidentiality issues in mind, give the options of telepsychiatry and/or hybrid services to the medical students, residents, and physicians; work out the terms and conditions of such services

Institutional Level Organization of Services

- ***Student welfare center/services:*** Designated team including faculty members, clinical psychologists, trainee residents, etc
- ***Crisis-Helpline:*** 24-hour on-call services which could be contacted anytime for psychiatric help

Assessment

A medical professional's assessment of mental health issues should be like that of any other patient concerning evaluating the signs and symptoms of mental illnesses (Table-5). However, some of the problems must be kept in mind while evaluating them. A doctor-patient client may be initially anxious and frightened like any other patient. Hence, the mental health professional should provide a friendly environment to open up and try to alleviate their anxiety. The treating psychiatrist should also inform about the professional doctor-patient relationship involved in the assessment and management so that the doctor-patient client realizes that it is not a casual conversation. It is also essential to reassure that they will be treated most appropriately, but as a patient and not as a doctor in this interaction. They should also be comforted that the confidentially will be maintained as for other patients, with certain exceptions (i.e., suicidality or if their behavior could risk the life of their patients). The clinician should also try to maintain professional boundaries by avoiding becoming overly close due to empathy or sympathy with their doctor-patient client[58].

Physicians and trainees may sometimes equate their symptoms/illness with weakness [58]. It is better to convey that their experience is part of an illness that anyone can experience.

Persons with a medical background often describe their problems using medical jargon rather than expressing their symptoms in detail, and try to cut corners when the history is being collected, or attempts are made for a detailed mental status examination. The psychiatrist should not take the labels of the symptoms described at face value and instead should ask them to explain what they mean when they use particular terminology. Further, many medical students and physicians will come up with self-diagnosis. The treating psychiatrist should not accept the self-diagnosis, and all attempts must be made to clarify the diagnosis. Another important aspect of this group of clients is that they may also tend to underestimate certain aspects of the problems such as substance use, marital problems, work-related stress, self-harming or suicidal behavior, dysfunction due to the symptoms, and impact of the illness on the professional life. Accordingly, the mental health professionals should go into the details about these aspects, spend enough time to evaluate the same, and seek collateral information from the informants, if they are available.

Another crucial point that must be considered while assessing doctor-patient clients includes focusing on profession-specific or work-related stressors to understand the association of psychiatric symptoms with work-related stress. An important aspect to consider is that some professionals may be workaholics and would not accept that the work stresses them and instead try to rationalize their behavior. Similarly, issues related to studies and careers should be evaluated while evaluating students and residents. Besides assessing the work-related matters, the treating psychiatrist should also not shy away from asking personal questions related to relationships, substance use, sexual history, sexual orientation, etc.

The prevalence of substance use disorders is common among doctor-patient clients. Hence, an attempt should be made to evaluate the same in detail concerning type of substance used, quantity, last use, impact on the same on the studies and profession, the impact of the same on work performance including patient-related activities, and any physical or psychological complications in the past. The mental health professional should not limit this inquiry into the self-reported substance and should extend the same to the evaluation of history for the use of all the possible substances. Further, information about excessive use of medications, such as benzodiazepines and other hypnotics and opioids, should be looked into.

The treatment history should also look into the past formal treatment received and for any kind of self-medication use. While evaluating the past treatment history, look for the duration of therapy, doses used, response to treatment, medication and treatment adherence, reasons for stopping medications, and the impact of medicines on professional functioning.

The assessment of suicidality is of paramount importance and should not be missed. All kinds of suicidal behaviors (past and current), including suicidal ideations, plans, attempts, and gestures,

should be enquired. While evaluating the same, the doctor-patient can be reassured that it is common for people with certain mental illnesses to have such features that resolve with treatment. While assessing suicidality, it is also essential to focus on the means used in the past and the access to means, in case a doctor-patient client expresses suicidal ideations and plans.

Many doctor-patient clients suffer from symptoms for a reasonable time before they seek consultation. Hence, it is also crucial to focus on what led to the current consultation. This will help to decide whether the client requires a crisis intervention.

Another important aspect of assessment, especially among the medical students and residents, is understanding their living arrangements. Often, this group of clients live in hostels or live in rented accommodations. This understanding can help determine the social support and supervision available. Other contextual issues which may be relevant to the assessment of medical students and residents include evaluation of problems related to adjustment to the new environment (food, accommodation, first time away from home, ragging or bullying faced, language barrier), and access to medications (anesthetic agents, psychotropic medications).

It is also vital for the psychiatrists to understand that some of the students, residents and physicians may have problems related to their personal life rather than solely work-related stress. Hence, these should not be ignored while carrying out the detailed assessment.

While evaluating this group of clients, the psychiatrist should remember that depending on the institutional policies and environment, clients may not meet a mental disorder's syndromal diagnosis and may present with, at best, an adjustment disorder or physician burnout. The psychiatrists should familiarize themselves with risk factors, causes, and clinical features of burnout (Table-6& 7). In general, it is essential to remember that social conflicts, overwhelming demands, lack or loss of resources, insufficient rewards, and absence of fairness at the workplace contribute to burnout. While evaluating physician burnout, it is also essential to assess the organizational work culture, as this may help in understanding the context in which the person is working or studying. While evaluating doctor-patient clients, the psychiatrists should also remember that even if the person fulfills a syndromal diagnosis, they may be having symptoms of burnout or burnout that could be contributing to the manifestation of a psychiatric disorder under evaluation. If required, the clinicians can use structured instruments like Maslach Burnout Inventory (MBI) [17], Oldenburg Burnout Inventory[61], Copenhagen Burnout Inventory[62], Burnout Clinical Subtype Questionnaire[63], Shirom Melamed Burnout Measure[64], Stanford Professional Fulfilment Index[65] to understand the level of physician burnout.

Assessment should also consider the impact of the current symptoms on the person's work-related functioning. This assessment should be individualized concerning the specialty, place of posting, type

of responsibilities, amount of face-to-face time with patients, possible consequences of any medical error which can occur due to symptoms, and risk to the life of the patient managed by them in the current mental state and risk to the life and medicolegal issues of the doctor-patient if they continue to work. Similarly, while evaluating the students and residents, issues related to upcoming examinations (theory/practicals) and meeting the deadlines for the academic assignments, including the thesis, should be kept in mind. Focusing on coping abilities, including the ability to bounce back in an adverse situation can also provide helpful information.

Finally, the assessment should also include evaluating the need for inpatient care or recommending leave. This assessment should consider the severity of symptoms, risk of harm to self and others (i.e., their patients), contextual factors including the available social support, and the working environment. If the assessment suggests that it would be better for the doctor-patient client to be off from work for some time, then the psychiatrist should be prepared to recommend medical leave.

Table-5: Assessment of Mental Health Issues among the Medical Students, Residents, and Practicing Physicians

History
Current symptoms: onset, precipitating factors, course of illness, duration, severity, level of dysfunction/consequences of psychiatric symptoms on psychiatric symptoms on the personal, social and personal life
Suicidal behavior: ideations, attempts, planning, assess to means, suicidal gestures
Past history of mental disorders
Family history of mental illness
Substance use: type of substance, the pattern of substance, any recent increase or decrease in the quantity of substance, last intake of the substance
Chronic medical illnesses: diabetes mellitus, hypertension, coronary artery disease, cerebrovascular disease, Parkinson's disease, Epilepsy, obesity, etc
Age and gender-specific issues: Premenstrual dysphoria, pregnancy, post-partum, sexual functioning/dysfunction, gender orientation, sexual harassment
Current and recent history of frequent infections (may be indicative of lower immunity)
Medication history: review all the prescription drugs, over-the-counter medications, any recent changes in the medicines, any recent change in medication doses, medication adherence
Self-medication: psychotropics, non-psychotropics; use of pattern – dependence/abuse
Type of professional responsibilities: team leader, the junior member of the team
Workplace stress:working hours, workload, interpersonal relationships with the seniors or other staff, academic pressure, sleep deprivation and disturbances, poor ability to cope with stress/dysfunctional coping (substance use), type and frequency of call duties (night call or weekend call), work environment, organization culture, level of documentation required at the workplace, financial remuneration and level of satisfaction with the same, risk of malpractice suits, kind of patients attended, control over the work environment, level of support from the superiors

and the administration, type of leaders at the workplace, opportunities for career advancement, time pressure to complete the work, kind of hierarchy followed at the workplace, level of autonomy, amount of positive feedback received at the workplace, sexual harassment at the workplace

Work-related behavior: level of dedication, conscientiousness, taking responsibility for the assigned work, level of commitment to work, workaholic, inability to delegate responsibility

Studies related stress (in the case of students and residents): exams, failures, academics, thesis, research-related issues, etc.

Patient and caregiver-related behaviors: violence against the doctors, pending medicolegal issues, pending inquiries

Level of social support outside the workplace or work environment: marital status, having a partner

Personality: level of perfectionism, Idealism, ambitiousness, masochism, self-criticism, anxiety about competence, anger, and aggression

Work-life balance: Problems of work-life balance

Workplace abuse: emotional abuse, sexual abuse, etc

Personal stressors: loneliness, relationships issues in personal life (martial functioning, relationship with the partner(s) in case not married), work interrupted by personal concerns

Coping mechanisms to deal with stress

Ways of unwinding: hobbies, socialization

Social support: number of friends, relationship with friends

Consequences of the mental symptoms on work and personal life: Medical errors, level of productivity, absenteeism, interpersonal relationships, substance use

Current status of work responsibility: Working independently or in a team, chances of risk to the life of the treated patients

Other contextual factors: Place of residence (hostel, paying guest, rented accommodation), number of friends, problems related to adjustment to the new environment (food, housing, first time away from home, ragging or bullying faced, language barrier), access to medications (anesthetic agents, psychotropic medications)

Physical examination

Detailed physical examination- looks for signs of anxiety (sweating, restlessness, tremors, etc.), substance withdrawal and substance use (marks of intravenous substance use), substance or medication intoxication (drowsy), and self-harm (cut-marks, scratches), etc.

Mental Status Examination

Besides the disorder-specific assessment, specifically focus on suicidal ideations, plan, attempt; relationship issues, and ongoing stress in the workplace

Investigations

Routine investigations: haemogram, renal function tests, serum electrolytes, liver function test, serum glucose levels, electrocardiogram

Other investigations: as per the psychiatric condition, physical comorbidity, and physical examination

Rating of the severity of illness

Table-6: Risk factors and features of physician burnout [66,67]

Risk factors for physician burnout	Causes of Burnout
• Young age • Female gender • Negative marital status • Long working hours • Low levels of job satisfaction • Sleep deprivation • High level of work/life conflict • Work interrupted by personal concerns • High level of anger, loneliness, or anxiety • The stress of work relationships • Anxiety about competency • Difficulty "unplugging" after work • Regular use of alcohol and other drugs	• **Workload:** high face-to-face time, documentation time, administrative time • **Specialty:** Neurosurgery • **Practice setting:** rural/urban, academic/non-academic, inpatient/outpatient • **Patient characteristics:** demand, entitlement, adherence, compliance • **Sleep deprivation:** self-explanatory • **Personality type: workaholic, masochistic** • **Loss of meaning in medicine and patient care:** decreased support, increased responsibility, without autonomy and flexibility • **Challenges in institutional cultures:** perceived lack of peer support, lack of professionalism, disengaged leadership • **Problems with work-life balance** • **Methods of dealing with death and suffering:** oncology, critical care, palliative care • **Methods of dealing with medical mistakes:** internal defenses, external support • **Malpractice suits:** internal defenses, external support, nature of the complaint • **Lack of control over practice environment**

Table-7: Signs and symptoms of physician burnout[68]

• Loss of motivation   • Feeling helpless, trapped, or defeated   • Anxiety, fear, tension, Hypersensitive, frequently losing temper   • Lack of empathy   • Increased cynicism and negative outlook about everything, pessimism   • Lowered satisfaction or sense of accomplishment   • Feeling tired and drained most of the time   • Frequent headaches and muscle aches   • Tiredness not relieved with adequate rest   • Lowered immunity: frequent infections   • Change in appetite or sleep habits   • Withdrawal from responsibilities   • Cognitive dulling: poor attention & concentration, subjective memory disturbances, executive dysfunction   • Procrastination   • Skipping work or coming in late and leaving early, not answering phone calls, isolating self   • Reduced work performance: slower in performing work   • Lack of flexibility: poor tolerance of ambiguity, inability to compromise

• Committing medical errors

Management

It is essential to understand that many doctor-patient clients seek help only once and have poor follow-up rates. Hence, the assessment and management should go hand to hand. Further, the follow-up with the treatment advice (both pharmacological and non-pharmacological) would be influenced by their attitude towards mental illnesses and psychotropics and psychosocial interventions. Additional factors that play a role in accepting treatment include the family's and accompanying co-workers'perspectivetowards the mental health treatment. The presence of inadequate or wrong knowledge about psychiatric illnesses and treatments also influences the treatment behavior.

Accordingly, the psychiatrist should appropriately utilize the first opportunity of assessment and management to address these issues, as this can go a long way in influencing not only the medication and treatment adherence of the doctor-patient client, but also influence their future attitude towards psychiatry as a specialty but also towards patients with mental illnesses. Once the initial assessment is complete, it should not be presumed that the doctor-patient understands their diagnosis and the course of the treatment. Accordingly, proper psychoeducation about the illness and treatment should be an integral part of the assessment. Similarly, if a doctor-patient client has come with a crisis, the crisis intervention should start from the first encounter itself.

The treating psychiatrist should spend enough time discussing the diagnosis and/or treatment plan. Give the doctor-patient client enough time to discuss the diagnosis and treatment (Table-8). Again, re-emphasize the issues related to privacy and confidentiality. The psychiatrist should remind the doctor-patient client that the National Medical Council code of ethics requires every physician to disclose the information *in the court of law under the orders of the Presiding Judge; in circumstances where there is a serious and identified risk to a specific person and/or community; and notifiable diseases* [69]. They should be informed about any institutional policies concerning the students, residents, and physicians. If any information is to be disclosed to the administration, they should be informed about who will be notified, how they will be told, and what will be revealed. Often the doctor-patient clients have low self-esteem due to mental illness when they are evaluated for the first time. Hence, the psychiatrist should make efforts to reassure them and improve their low self-esteem. If inpatient care is being considered, inform the doctor-patient client about the same, along with the details about the indications for inpatient care,and risks involved in avoiding inpatient care. Inpatient care should be considered as per the recommendations for various diagnoses. However,

some of the issues (not necessarily a comprehensive list) which may be pertinent for consideration of inpatient care are listed in table-9.

Tabe-8: Issues and Principles to be kept in mind while closing the first assessment session

- Have enough time in hand after the assessment is done to address the issues of the doctor-patient client
- Give the doctor-patient client enough time to discuss the diagnosis and treatment
- If inpatient care is being considered, inform the doctor-patient about the same, along with the details about the indications for inpatient care and the risks involved with not admitting
- Again, re-emphasize the issues related to privacy and confidentiality and the exceptions to the same
- Address the low self-esteem
- Carry out crisis intervention, if the first consultation was precipitated by a personal life crisis or work-related crisis
- Choose the pharmacotherapy with mutual agreement and informed decision-making
- Decide about the non-pharmacological treatments which are feasible, effective, and evidence-based.
- Emphasize the need for medication and treatment adherence
- Discuss the high-risk management, as per the requirement
- Discuss the pros and cons of involving a family member in the treatment
- Address the issues of risk involved in continuing to work in the current clinical state
- Discuss taking a break from work
- Discuss the need for inpatient care, and its benefits
- Decide about the follow-up plan

Table-9: Some of the indications for inpatient care

- Presence of suicidal ideations and/or plans
- Recent suicide attempt
- The patient has threatened or physically hurt someone else
- Impairment of reality testing, poor insight, and poor judgment
- Rapidly deteriorating course
- Failure to improve despite adequate treatment
- Severe illness
- Violent and aggressive patient
- Patients with psychosis and mania lack insight and require treatment initiation
- Severe emotional breakdown
- Substance intoxication or severe withdrawal
- Requiring special therapy

Similarly, if the assessment suggests that it would be better for the doctor-patient client to be off work for some time, i.e., till they recover. In that case, this issue should be discussed in detail, and they should be informed about the facts being taken into account to reach such a decision.

If any kind of pharmacological intervention is being offered, spend enough time in mutual discussion with the doctor-patient client to choose the most appropriate agent for them. Like any other patient, they should be given the opportunity to select the pharmacological agent. When choosing a pharmacological agent, the impact of the medication on functioning should be kept in mind. The doctor-patient clients often underestimate or overestimate the need for medication and treatment adherence. They should be provided enough information about the risks involved with poor medication adherence.

Sometimes, despite being indicated, doctor-patient clients may refuse to take medications. In such a scenario, efforts should be made to explain to them the pros and cons of not starting the medicines. Additionally, the mental capacity of the doctor-patient client should be taken into account before making a final decision.

On the other hand, if the assessment suggests that the doctor-patient client may not require any pharmacological treatment, the same must also be shared with them, as this may also help to relieve a lot of anxiety.

Similarly, while considering non-pharmacological treatments, they should be provided with the full menu, explained the feasibility (time required, frequency of sessions, expectations from them as a patient), and be given the option to choose by taking into consideration the available time with them. If the doctor-patient client requires high-risk management, this should be kept in place at the earliest. All efforts must be made to explain to them the need for the same. At times the doctor-patient clients are not comfortable involving anyone in their treatment. This may be alright if they are not suicidal, but if there is a risk of suicidality, then all efforts must be made to ensure the safety of the patient.

Before closing the initial session, it is important to discuss the follow-up plan. The doctor-patient clients should be informed about the need to keep the consultation as a formal interaction so that the objectivity of the doctor-patient relationship can be maintained from either side. If the doctor-client patient is prepared to follow up but is reluctant due to confidentiality issues (being seen by other staff in the psychiatry services), they should be given the option of following up on teleservices. In such a situation, it is better to discuss beforehand when the teleconsultation will be converted to a face-to-face consultation.

Besides addressing the issues of the doctor-patient client, the psychiatrist should also address the issues raised by the caregivers without breaching confidentiality. The interaction with the caregivers

should also be taken up as an opportunity to discuss the high-risk management if required, addressing the issue of the need for social support and addressing the interpersonal issues in the personal life, if these are contributing to the clinical picture in any way. The caregivers can also be involved in the supervision of treatment, accompanying the patient during the inpatient stay.

Management of specific psychiatric disorders should be done as per the clinical practice guidelines for the particular disorder. The treating psychiatrists should follow the recommendations and modify the same as per the requirement of the doctor-patient client.

In case a doctor-patient client is recommended leave or receives inpatient care, then during the follow-up, they should be prepared to handle the stigma. The doctor-patient clients often face self-stigma and public stigma. Addressing public stigma may not be in the hand of treating psychiatrists, but the self-stigma should be addressed. Self-stigma is defined differently by different authors. According to one of the definitions, it is understood as "shame, evaluative thoughts and fear of enacted stigma as a result of individuals' own identification with a stigmatized group that serves as a barrier to the pursuit of valued life goals" [70]. According to another definition it "involves negative beliefs about the self, strong negative feelings, for example of self-hate and shame, as well as putting oneself at a disadvantage, for example through social withdrawal" [71]. Some of the commonly recommended strategies for reducing self-stigma include improving self-esteem, self-efficacy, empowerment, and self-compassion [72](Table-10).

In case a doctor-patient client is recommended leave, the psychiatrist should reassess the person and ensure that the persons symptoms have improved to such an extent that he can function adequately. This assessment should take into consideration the job profile (for example, night duties, specialty in which the colleague is working, expected work pressure), available social support at the work place and outside the work place, past history of relapse or lack of relapse of symptoms after joining back, and the client's own preparedness to joining.

Occasionally, a medical student, resident or a medical professional end up, taking extreme step and consequently loosing their life as a result of suicide. In such a situation, the fellow students and colleagues are often shocked, distressed or in anger. In such a situation, a psychiatrist may be asked to address the fellow students. Depending on the situation (individual or group), the psychiatrist should listen to the fellow students or the colleague of the person who has lost their life, should acknowledge the loss, try to understand what others feel about the possible contributory factors, try to reassure them, address their emotional turmoil and if required inform the administration about the needs for corrections at the institutional levels to prevent future events.However, they should refrain from making any false promises on behalf of the administration. The psychiatrist can also take this oppourtunity to educate the students about the mental illnesses among medical

professionals, need for seeking help, available resources in the institute and how the students can act as gate-keepers for their colleagues and prevent such unfortunate events in future.

Table-10: How to address self-stigma: improving self-esteem, empowerment, and self-compassion

Strategies to improve self-esteem
• Be kind to yourself
• Reduce negative self-talk
• Focus on your strengths
• Don't equate yourself with your illness
• Avoid self-isolation
• Have positive relationships
• Be assertive
• Try to say NO, when required
• Speak against stigma
Strategies to improve self-efficacy
• Celebrate your success
• Seek people who give you positive feedback and avoid people who give you negative feedback
• Pay attention to your negative thoughts and try to counter them with positive thoughts
Strategies to improve empowerment
• Having a positive attitude towards life
• Take care of self
• Have reasonable goals
• Have the company of positive people, use positive self-talk, be assertive, and take action
Strategies to improve self-compassion [73]
• Treat yourself as you would treat a friend in need- encourage yourself rather than being harsh and belittling yourself
• Understand common humanity (no one is perfect- it is not me only who has deficiencies or limitations- every human has some or other deficit; take a broader perspective of own life)
• Mindfulness (i.e., being aware of own negative thoughts, don't try to overidentify self with the same)

The management of physician burnout involves the use of individual-level strategies and organization-level strategies. While dealing with the individual doctor-patient client, the psychiatrist can use individual-level strategies to address the burnout. Depending on the institutional ethics and culture, the psychiatrists should also strive to make changes at the institutional level to improve the working environment of the organization.

In terms of individual-level strategies, it is essential to remember that there is a significant overlap between the preventive and treatment methods. Some of the strategies which have been suggested include mindfulness-based techniques, self-care, stress management techniques, cognitive

behavioral techniques, improving communication skills, gratitude interventions, development of interpersonal skills, and development of knowledge and work-related skills to enhance job competence and improve communication skills and personal coping strategies[15,74]. Enhancing control over the work, improving flexibility and work-life integration by focusing on organizational skills, personal efficiency, and personal factors that affect the work-life can also help to reduce physician burnout.

In terms of organization-level interventions (Table-11), the psychiatrist should make an effort at their level with the administration to make it more physician-friendly.

The mental health professionals should also strive to reduce stigma at the institutional level, which will promote help seeking.

Tabe-11: Organizational level strategies to manage physician burnout [15,74]

- Workplace supportive measures (appointing medical scribes, establishing a crisis helpline, and easy access to mental health care)
- Reducing stigma toward mental illnesses
- Inclusion of stress management and burnout prevention modules as part of the medical education curriculum
- Improving physician autonomy (ability to influence work environment and schedule control)
- Modifying the work processes and flow
- Promoting a collegial work environment (promoting healthy relationships and common goals)
- Adequate support services (such as nursing, secretarial, administrative, social work, and ancillary services) and support in the form of Apps, software, etc.
- Formation and implementation of a culture/social connection calendar to improve interactions
- Work hour modifications: rationalize the working hours, flexible working hours, and Time-banking system
- Having explicit policies for cross coverage, vacation, sick leave, maternity, and paternity leave
- Access to self-care resources
- Restructuring of the task
- Making the environment more congenial for learning
- Organization of social events
- Increasing the level of participation in decision-making
- Opportunities for professional development
- Screening employees at regular intervals and identifying the problem areas to bring about changes

References
1. Rotenstein LS, Ramos MA, Torre M, Segal JB, Peluso MJ, Guille C, et al. Prevalence of Depression, Depressive Symptoms, and Suicidal Ideation Among Medical Students: A Systematic Review and Meta-Analysis. JAMA 2016;316(21):2214–36.

2. Mata DA, Ramos MA, Bansal N, Khan R, Guille C, Angelantonio ED, et al. Prevalence of Depression and Depressive Symptoms Among Resident Physicians A Systematic Review and Meta-analysis. JAMA 2015;314(22):2373–83.

3. Bailey E, Robinson J, McGorry P. Depression and suicide among medical practitioners in Australia. Intern Med J 2018;48(3):254–8.

4. Abdulla EK, Velladath SU, Varghese A, Anju M. Depression and anxiety associated with COVID-19 pandemic among healthcare professionals in India- A systematic review and meta-analysis. Clin Epidemiol Glob Health 2021;12:100888.

5. Tung YJ, Lo KKH, Ho RCM, Tam WSW. Prevalence of depression among nursing students: A systematic review and meta-analysis. Nurse Educ Today 2018;63:119–29.

6. Isfahani P, CoraniBahador R, Peirovy S, Afshari M, Samani S. Prevalence of Depression Among Nurses of Iran: A Meta-analysis. Evid Based Health Policy Manag Econ 2022;6(2):137–47.

7. Xie N, Qin Y, Wang T, Zeng Y, Deng X, Guan L. Prevalence of depressive symptoms among nurses in China: A systematic review and meta-analysis. PLOS ONE 2020;15(7):e0235448.

8. Pereira-Lima K, Mata DA, Loureiro SR, Crippa JA, Bolsoni LM, Sen S. Association Between Physician Depressive Symptoms and Medical Errors. JAMA Netw Open 2019;2(11):e1916097.

9. Schwenk TL, Gorenflo DW, Leja LM. A survey on the impact of being depressed on the professional status and mental health care of physicians. J Clin Psychiatry 2008;69(4):617–20.

10. Dwivedi N, Sachdeva S, Taneja N. Depression among medical students of India: Meta-analysis of published research studies using screening instruments. Indian J Soc Psychiatry 2021;37:183.

11. Kaushik A, Ravikiran SR, Suprasanna K, Nayak MG, Baliga K, Acharya SD. Depression, anxiety, stress and workplace stressors among nurses in tertiary health care settings. Indian J Occup Environ Med 2021;25(1):27.

12. Shajan A, Nisha C. Anxiety and depression among nurses working in a tertiary care hospital in South India. Int J Adv Med 2019;6(5):1611–5.

13. Dutheil F, Aubert C, Pereira B, Dambrun M, Moustafa F, Mermillod M, et al. Suicide among physicians and health-care workers: A systematic review and meta-analysis. PloS One 2019;14(12):e0226361.

14. Goyal A, Kishore J, Anand T, Rathi A. Suicidal ideation among medical students of Delhi. J Ment Health Hum Behav 2012;17.

15. Grover S, Adarsh H, Naskar C, Varadharajan N. Physician burnout: A review. J Ment Health Hum Behav 2018;23(2):78.

16. Schaufeli WB, Greenglass ER. Introduction to special issue on burnout and health. Psychol Health 2001;16(5):501–10.

17. Maslach C, Jackson SE. The measurement of experienced burnout. J Organ Behav 1981;2(2):99–113.

18. Frajerman A, Morvan Y, Krebs MO, Gorwood P, Chaumette B. Burnout in medical students before residency: A systematic review and meta-analysis. Eur Psychiatry J Assoc EurPsychiatr2019;55:36–42.

19. Rodrigues H, Cobucci R, Oliveira A, Cabral JV, Medeiros L, Gurgel K, et al. Burnout syndrome among medical residents: A systematic review and meta-analysis. PloS One 2018;13(11):e0206840.

20. Rotenstein LS, Torre M, Ramos MA, Rosales RC, Guille C, Sen S, et al. Prevalence of Burnout Among Physicians: A Systematic Review. JAMA 2018;320(11):1131–50.

21. Woo T, Ho R, Tang A, Tam W. Global prevalence of burnout symptoms among nurses: A systematic review and meta-analysis. J Psychiatr Res 2020;123:9–20.

22. Shanafelt TD, Hasan O, Dyrbye LN, Sinsky C, Satele D, Sloan J, et al. Changes in Burnout and Satisfaction With Work-Life Balance in Physicians and the General US Working Population Between 2011 and 2014. Mayo Clin Proc 2015;90(12):1600–13.

23. Chen C, Meier ST. Burnout and depression in nurses: A systematic review and meta-analysis. Int J Nurs Stud 2021;124:104099.

24. Koutsimani P, Montgomery A, Georganta K. The Relationship Between Burnout, Depression, and Anxiety: A Systematic Review and Meta-Analysis. Front Psychol2019;10:284.

25. Salvagioni DAJ, Melanda FN, Mesas AE, González AD, Gabani FL, Andrade SM de. Physical, psychological and occupational consequences of job burnout: A systematic review of prospective studies. PloS One 2017;12(10):e0185781.

26. Farrell SM, Moir F, Molodynski A, Bhugra D. Psychological wellbeing, burnout and substance use amongst medical students in New Zealand. Int Rev Psychiatry 2019;31(7–8):630–6.

27. Pharasi S, Patra S. Burnout in medical students of a tertiary care Indian medical center: How much protection does resilience confer? Indian J Psychiatry 2020;62(4):407–412.

28. Grover S, Sahoo S, Bhalla A, Avasthi A. Psychological problems and burnout among medical professionals of a tertiary care hospital of North India: A cross-sectional study. Indian J Psychiatry 2018;60(2):175–88.

29. Ratnakaran B, Prabhakaran A, Karunakaran V. Prevalence of burnout and its correlates among residents in a tertiary medical center in Kerala, India: A cross-sectional study. J Postgrad Med 2016;62(3):157–61.

30. Kumar A, Sinha A, Varma JR, Prabhakaran AM, Phatak AG, Nimbalkar SM. Burnout and its correlates among nursing staff of intensive care units at a tertiary care center. J Fam Med Prim Care 2021;10(1):443–448.

31. Kesarwani V, Husaain ZG, George J. Prevalence and Factors Associated with Burnout among Healthcare Professionals in India: A Systematic Review and Meta-Analysis. Indian J Psychol Med 2020;42(2):108–15.

32. Quek TTC, Tam WWS, Tran BX, Zhang M, Zhang Z, Ho CSH, et al. The Global Prevalence of Anxiety Among Medical Students: A Meta-Analysis. Int J Environ Res Public Health 2019;16(15):E2735.

33. Sarkar S, Gupta R, Menon V. A systematic review of depression, anxiety, and stress among medical students in India. J Ment Health Hum Behav 2018;22.

34. Qasim S, Alrasheed A, Almesned F, Alduhaymi M, Aljehaiman T, Omair A. Insomnia among medical students and its association with exams. 2021;1.

35. Sahebi A, Abdi K, Moayedi S, Torres M, Golitaleb M. The prevalence of insomnia among health care workers amid the COVID-19 pandemic: An umbrella review of meta-analyses. J Psychosom Res 2021;149:110597.

36. Giri P, Baviskar M, Phalke D. Study of Sleep Habits and Sleep Problems Among Medical Students of Pravara Institute of Medical Sciences Loni, Western Maharashtra, India. Ann Med Health Sci Res 2013;3(1):51–4.

37. Joseph A, Brooke SM, Jelby, Pushpalatha, Sharon, Sunitha. The prevalence of shift work sleep disorder and the quality of sleep among nurses working in selected Hospitals, Hyderabad. Indian J PsychiatrNurs 2018;15(1):10.

38. Verma A, Kishore J, Gusain S. A Comparative Study of Shift Work Effects and Injuries among Nurses Working in Rotating Night and Day Shifts in a Tertiary Care Hospital of North India. Iran J Nurs Midwifery Res 2018;23(1):51–6.

39. Arora A, Kannan S, Gowri S, Choudhary S, Sudarasanan S, Khosla PP. Substance abuse amongst the medical graduate students in a developing country. Indian J Med Res 2016;143(1):101–3.

40. Ahmadi J, Maharlooy N, Alishahi M. Substance abuse: prevalence in a sample of nursing students. J Clin Nurs 2004;13(1):60–4.

41. Haack MR, Harford TC. Drinking patterns among student nurses. Int J Addict 1984;19(5):577–83.

42. Bhugaonkar MG, Jha RK, Zilate S. Review on Overview of Substance Abuse among Medical Practitioners. J Pharm Res Int 2021;43–7.

43. Dunn D. Substance abuse among nurses—Defining the issue. AORN J 2005;82(4):572–96.

44. Sahu A, Bhati N, Sarkar S. A systematic review and meta-analysis of substance use among medical students in India. Indian J Psychiatry 2022;64(3):225–239.

45. Murthy P, Manjunatha N, Subodh BN, Chand PK, Benegal V. Substance use and addiction research in India. Indian J Psychiatry 2010;52(Suppl1):S189–99.

46. Salari N, Khazaie H, Hosseinian-Far A, Ghasemi H, Mohammadi M, Shohaimi S, et al. The prevalence of sleep disturbances among physicians and nurses facing the COVID-19 patients: a systematic review and meta-analysis. Glob Health 2020;16:92.

47. Gold KJ, Andrew LB, Goldman EB, Schwenk TL. "I would never want to have a mental health diagnosis on my record": A survey of female physicians on mental health diagnosis, treatment, and reporting. Gen Hosp Psychiatry 2016;43:51–7.

48. Wijeratne C, Johnco C, Draper B, Earl J. Doctors' reporting of mental health stigma and barriers to help-seeking. Occup Med OxfEngl 2021;71(8):366–74.

49. Brower KJ. Professional Stigma of Mental Health Issues: Physicians Are Both the Cause and Solution. Acad Med 2021;96(5):635–40.

50. Edwards JL, Crisp DA. Seeking help for psychological distress: Barriers for mental health professionals. Aust J Psychol 2017;69(3):218–25.

51. Guille C, Speller H, Laff R, Epperson CN, Sen S. Utilization and Barriers to Mental Health Services Among Depressed Medical Interns: A Prospective Multisite Study. J Grad Med Educ 2010;2(2):210–4.

52. Mehta SS, Edwards ML. Suffering in Silence: Mental Health Stigma and Physicians' Licensing Fears. Am J Psychiatry Resid J 2018;13(11):2–4.

53. Berliant M, Rahman N, Mattice C, Bhatt C, Haykal KA. Barriers Faced by Medical Students in Seeking Mental Healthcare: A Scoping Revie [Internet]. 2022 [cited 2022 Jul 17]. Available from: https://doi.org/10.21203/rs.3.rs-1344013/v1

54. Dyrbye LN, Eacker A, Durning SJ, Brazeau C, Moutier C, Massie FS, et al. The Impact of Stigma and Personal Experiences on the Help-Seeking Behaviors of Medical Students With Burnout. Acad Med J Assoc Am Med Coll 2015;90(7):961–9.

55. Menon V, Sarkar S, Kumar S. Barriers to healthcare seeking among medical students: a cross sectional study from South India. Postgrad Med J 2015;91(1079):477–82.

56. Menon V, Sarkar S, Kumar S. A cross-sectional analysis of barriers to health-care seeking among medical students across training period. J Ment Health Hum Behav 2017;22(2):97.

57. Clough BA, Zarean M, Ruane I, Mateo NJ, Aliyeva TA, Casey LM. Going global: do consumer preferences, attitudes, and barriers to using e-mental health services differ across countries? J Ment Health Abingdon Engl 2019;28(1):17–25.

58. Bird S. Doctors as patients. Aust Fam Physician [Internet] 2008 [cited 2022 Jul 17];37(4). Available from: https://search.informit.org/doi/10.3316/INFORMIT.354163552508762

59. Schneck SA. "Doctoring" doctors and their families. JAMA 1998;280(23):2039–42.

60. Weintraub W. "THE VIP SYNDROME": A CLINICAL STUDY IN HOSPITAL PSYCHIATRY. J NervMent Dis 1964;138(2):181–193.

61. Demerouti E, Bakker AB, Vardakou I, Kantas A. The convergent validity of two burnout instruments : a multitrait-multimethod analysis. Eur J Psychol Assess 2003;19(1):12–23.

62. Kristensen TS, Borritz M, Villadsen E, Christensen KB. The Copenhagen Burnout Inventory: A new tool for the assessment of burnout. Work Stress 2005;19(3):192–207.

63. Montero-Marín J, García-Campayo J. A newer and broader definition of burnout: Validation of the "Burnout Clinical Subtype Questionnaire (BCSQ-36)." BMC Public Health 2010;10(1):302.

64. Shirom A, Melamed S. A comparison of the construct validity of two burnout measures in two groups of professionals. Int J Stress Manag 2006;13(2):176–200.

65. Trockel M, Bohman B, Lesure E, Hamidi MS, Welle D, Roberts L, et al. A Brief Instrument to Assess Both Burnout and Professional Fulfillment in Physicians: Reliability and Validity,

Including Correlation with Self-Reported Medical Errors, in a Sample of Resident and Practicing Physicians. Acad Psychiatry J Am Assoc Dir PsychiatrResid Train Assoc Acad Psychiatry 2018;42(1):11–24.

66.   Kumar S. Burnout and Doctors: Prevalence, Prevention and Intervention. Healthc Basel Switz 2016;4(3):E37.

67.   Sargent MC, Sotile W, Sotile MO, Rubash H, Barrack RL. Quality of life during orthopaedic training and academic practice. Part 1: orthopaedic surgery residents and faculty. J Bone Joint Surg Am 2009;91(10):2395–405.

68.   Merlo G, Rippe J. Physician Burnout: A Lifestyle Medicine Perspective. Am J Lifestyle Med 2020;15(2):148–57.

69.   National Medical Council. Code of Medical Ethics Regulations, 2002,Amendedupto 8th October 2016 [Internet]. 2002 [cited 2022 Jul 17];Available from: https://www.nmc.org.in/rules-regulations/code-of-medical-ethics-regulations-2002/

70.   Luoma JB, Kohlenberg BS, Hayes SC, Bunting K, Rye AK. Reducing self-stigma in substance abuse through acceptance and commitment therapy: Model, manual development, and pilot outcomes. Addict Res Theory 2008;16(2):149–65.

71.   Hilbert A, Braehler E, Schmidt R, Löwe B, Häuser W, Zenger M. Self-Compassion as a Resource in the Self-Stigma Process of Overweight and Obese Individuals. Obes Facts 2015;8(5):293–301.

72.   Neff KD. The development and validation of a scale to measure self-compassion. Self Identity 2003;2(3):223–50.

73.   Neff KD. Self-Compassion: An Alternative Conceptualization of a Healthy Attitude Toward Oneself. Self Identity 2003;2(2):85–101.

74.   Carrau D, Janis JE. Physician Burnout: Solutions for Individuals and Organizations. PlastReconstrSurg Glob Open 2021;9(2):e3418.

Clinical Practice Guidelines for use of Electroconvulsive therapy

<u>Introduction</u>:

Electroconvulsive therapy (ECT) is a clinical procedure where a small dose of electric current is passed through the brain for a brief period to induce seizures for therapeutic purposes in psychiatric (and certain neurological) conditions. Modified ECT is the modern form of ECT where electrical stimulus is given under general anaesthesia and muscle relaxation. This is one of the most effective treatments for many psychiatric conditions. Modern modified ECT is a safe treatment when practiced with adequate knowledge, skills, and expertise. Following the basic standards of ECT practice is necessary for better clinical outcomes including minimal cognitive adversities. This guideline document is aimed to enable consistent, safe, and effective practice of ECT in patients in applicable psychiatric disorders.

<u>Methods:</u>

These guidelines are developed as part of the initiative of Clinical Practice Guidelines (CPG) subcommittee of Indian Psychiatric Society. The initial draft guideline was developed by the authors. The information was sourced from the key research articles, and national/international guidelines on psychiatric care and ECT. No formal systematic literature search was conducted. The current guideline was prepared to suit the existing Indian mental health care system and legislations. The draft was further presented and discussed in the in-person workshop of CPG-2022. The draft was revised following the discussion in the workshop based on consensus-based recommendation method.

This guideline is not a directive or mandatory instruction but a guidance document for professional practitioners administering ECT. This is not a full and complete review of ECT procedure. But it is intended to improve patient outcomes by facilitating best practice standards by maximising benefits and minimising adversities.

<u>Use of Electroconvulsive therapy</u>

<u>Indications</u>:

Evidence exists for the efficacy of ECT in Depressive episodes, manic episodes and acute exacerbations of psychosis in schizophrenia.

Treatment resistant depression, mania and schizophrenia, including clozapine resistant schizophrenia are well recognised indications with great level of evidence from comparative trials (comparison across types of ECT or with waitlisted patients) though not much in sham-controlled trials.

ECT should not be withheld until failure of several medication/psychotherapy trials in severe depression. Health economics suggests that ECT should be considered as a 2nd-3rd line agent in severe depression.

ECT is considered as first-line (primary) treatment for emergency psychiatric conditions across diagnosis. These include high suicidality, catatonia, excitement, aggression, poor oral intake, acute psychotic symptom exacerbations, and severe physical debilitation secondary to psychiatric disorders. The evidence base is not very great in such indications due to ethical and pragmatic reasons in conducting sham-controlled trials in these emergency life-threatening transdiagnostic situations. But almost all international standard guidelines suggest ECT as a first-line treatment option in these indications.

Predictors of response

In general elderly age group, psychotic symptoms, and shorter episode duration are predictors of better ECT response

Melancholic features and greater baseline depressive symptom severity are likely associated with better ECT response

Continuation/Maintenance (C/M) ECT should be considered for patients with a history of severe, recurrent episodes who have failed to remain well on medications

Table: Indications of ECT

Disorders	Indications

Major depressive disorder	- Poor oral intake - High suicidal risk - High patient distress requiring rapid symptom remission - with psychotic features - with melancholic features - Peripartum Depression - Failure to adequate trials of antidepressants (and psychotherapy)
Mania	- Require rapid clinical improvement - Persisting/clinically significant agitation and aggression. - Resistant Mania
Schizophrenia and related disorders	- Acute psychosis - Acute exacerbations of positive psychotic/affective symptoms of schizophrenia and schizoaffective disorder. - Past response - Treatment resistant schizophrenia - Clozapine augmentation in clozapine resistant schizophrenia - Puerperal psychosis
Catatonia	- Resistant to benzodiazepine trial - Past response - Malignant catatonia, imminent mortality, Delirious mania
Autism	Severe repetitive self-injurious behaviour
Dementia	Agitation and aggression
Obsessive compulsive disorder	- Comorbid depression - Difficult-to-treat OCD, before invasive neurosurgical procedures
Parkinson's disease	- On-off phenomenon with non-response to medicines - Wearing-off phenomenon - Comorbid Severe depression/psychosis
Epilepsy	- Intractable temporal lobe epilepsy - Status epilepticus
Neuroleptic Malignant Syndrome	- With any dopamine antagonist (irrespective of underlying indication) - Withdrawal of a dopamine agonist (irrespective of underlying indication)

ECT is a first-line treatment when rapid and/or definitive response to avert harm to self/others is needed. Acute suicidal risk, agitation, catatonia, deteriorating physical status secondary to psyhcitaric condition are some of such situations.

ECT should be considered for treatment at appropriate stages and not only after treatment-resistance'.

After an acute course of ECT, continuation/maintenance treatment with pharmacotherapy/ psychotherapy is needed.

All the indications mentioned above have to be individualised and should be based on the patient's clinical needs, patient preferences and putative risk of adverse effects.

ECT staffing (Weiners, APA task force report):

ECT without anaesthesia and muscle relaxation is now prohibited under the Mental Health Care Act, 2017. Hence, the following staffing is advisable for administering modified ECT.

Table: ECT staffing

Staff	Number	Remarks
ECT Psychiatrist	1	Psychiatrist trained in ECT. The role is to assess patients before ECT, ensure indication of ECT, pre-ECT evaluation, determination of how each treatment is administered (except for anaesthetic considerations) and documentation of these aspects.
Anaesthesia provider	1	Anaesthesiologist/ Anaesthesia technician. This person requires skill in conducting pre-anaesthetic evaluation, airway management, cardiopulmonary resuscitation, emergency life-support, management of acute adverse events/medical emergencies arising during or soon after ECT. High-risk cases should be handled only by an anaesthesiologist.
ECT nurse	1	Staff nurse trained in ECT. This can be an OT nurse with basic training in ECT related aspects including pre-ECT assessments and consent, assisting in anaesthesia, monitoring vitals, coordinating logistics and ensuring availability of supplies and ECT equipment.
Recovery nurse	1	Staff nurse trained in post-anaesthesia recovery care. The recovery nurse should be capable of monitoring vital signs, pulse oximetry, electrocardiogram, (ECG); administering oxygenation, intravenous fluids, suctioning and provide supportive care for disorientation, delirium and/or agitation.

Treatment Site and Equipment

The treatment suite ideally involves three distinct areas but which are nearby/closely connected:

a. Waiting/preparation room: should have following facilities:

   i. Waiting area for patient & caregivers

   ii. Space for assessment: interview and examination, verifying the records and adequate subject preparation

   iii. Vitals monitoring: Blood pressure monitoring & stethoscope

b. ECT administration room

   i. ECT apparatus including bite block, electroencephalogram (EEG) monitor and Electrocardiogram (ECG) monitor

   ii. Anaesthetic agents (eg., Thiopentone, propofol, etomidate, ketamine , isoflurane, sevoflurane etc) and muscle relaxants (along with Succinylcholine, minimum one non-depolarising agent like atracurium or rocuronium should be available)

   iii. Emergency medication tray to manage uncontrolled hypertension, hypotension, cardiac arrhythmia, cardiopulmonary arrest, anaphylactic shock, prolonged seizure/status epilepticus. This should include intravenous fluids, epinephrine, dopamine, atropine/glycopyrrolate, cholinesterase inhibitors (neostigmine, physostigmine), anticonvulsants (lorazepam, diazepam, phenytoin), steroids, beta blockers (esmolol, labetalol), alpha-blockers (prazosin, clonidine), vasodilators (nitroglycerin, hydralazine), antiarrhythmics (lidocaine), analgesics (paracetamol), antiemetics (domperidone, metoclopramide), antihistamines (chlorpheniramine, cetirizine), bronchodilators (aminophylline) among others)

   iv. Vitals monitoring: Sphygmomanometer, reflex hammer, Electrocardiogram, oxygen saturation, ECG

    v.   Intubation set: oral and naso-pharyngeal airways

    vi.   Oxygen delivery system with intermittent positive pressure ventilation capabilities through mask as well as Endotracheal tubes

    vii.   Suction apparatus, iv infusion set, syringes with needles, cotton and gauze pads, hand gloves.

    viii.   Defibrillator

    ix.   Portable cots/beds, disposable containers

  c. Recovery room: Should have all items iii to ix listed above

Informed Consent

Written informed consent has to be taken before initiating ECT based on principles of shared decision making.

Consent should be taken following due procedures in accordance with the highest ethical standards and applicable laws/regulations. Written information material may be provided to the patient and care-givers and adequate time to be provided for reverting back with any clarifications. (Supplementary attached)

The information should be provided regarding the anticipated benefits and possible short term and long-term adverse effects of modified ECT (should mention about the possible risks with both anaesthesia and ECT) in the given individual. Discussion on type of ECT, modification procedure, electrode placement and expected outcomes should be involved in this process.

Unless the patient disagrees, it is recommended to make care-givers a part of this informed consenting process.

If a patient does not have capacity to consent, the same needs to be documented. The advance directives if any has to be examined and in accordance with that the consent may be obtained from the nominated representative/legally appointed representative.

In case of minors oral/verbal accent (as per the age) along with a written informed consent from parents/nominated representative/legally appointed representative should be obtained.

In case of minors or individuals without capacity to consent, a decision about initiating ECT has to be taken only after concurrence by two independent psychiatrist/psychiatrist + physician and due permission from the mental health review board as per the local regulations.

As and when a patient regains capacity to consent to ECT/attains 18 years of age, the consent has to be obtained for continuing ECT sessions then onwards.

Consent has to be taken again before initiating continuation/maintenance ECT, where the clinical condition, purpose (consolidation/relapse prevention) and character of treatment (frequency of ECT sessions and end-point) would have changed.

Pre-ECT Evaluation: Should be performed as close to the ECT session as possible.

Physical and psychiatric evaluation

Psychiatric evaluation to ascertain indications. Rating scales can be used to ascertain indication systematically and measure the changes during ECT course.

Past history of ECT and past response to ECT. Further details on the electrode placement and dose in earlier ECTs would guide current ECT course.

Evaluate the psychotropic medications that can potentially interfere with anaesthesia and ECT. Example- anticonvulsants that increase seizure threshold, antipsychotics like chlorpromazine, clozapine that are pro-convulsants, lithium can increase the risk of postictal delirium, tricyclic antidepressants that can increase risk of cardiac adverse events during ECT/anaesthesia, and so on.

Physical examination to identify any relative contra-indications and prevent complications. It should mandatorily involve fundoscopic examination along with other systemic examination. Dental evaluation for loose teeth/ missing tooth, cardiovascular examination for arrhythmia, neurological comorbidities, pulmonary clinical evaluation are mandatory.

Table: Clinical conditions requiring extreme caution while administering ECT

Cerebral	Ocular	Cardiac	Neuromuscular
1. Raised intracerebral pressure - Intracerebral space occupying lesions 2. Unstable cerebral aneurysm 3. Pheochromocytoma 4. Recent intracerebral haemorrhage	5. Raised intraocular pressure 6. Retinal detachment	7. Recent Myocardial infarction 8. Poor cardiac output 9. Unstable arrhythmias 10. Medical conditions associated with high-risk for general anaesthesia (ASA level 4 or 5) 11. Third degree burns	12. Spinal injuries 13. Bone fractures 14. Recurrent dislocations

A pre-anaesthetic checkup is recommendable so as to plan for anaesthetic agent and muscle relaxant. Also, suitable investigations or interventions can be planned in presence of medical conditions associated with substantial risk to general anaesthesia related complications.

Baseline cognitive screen

Monitoring of cognitive adverse effects in patients receiving ECT would be necessary. Baseline knowledge of cognitive abilities are crucial in attributing the changes in cognitive abilities with ECT.

Hindi Mental status examination, Mini Mental Status examination are simple but insensitive tools for monitoring.

Montreal cognitive assessment battery (MoCA), brief ECT cognitive screen are some of the internationally used assessment tools.

"Battery for ECT related cognitive deficits" (B4ECT Recode) is a tool validated in the Indian population and is recommended to be used during initiation and during the course of ECT.

Investigations

For general anaesthesia: Haemoglobin levels, blood sugar, electrolytes, blood urea, serum creatinine in all patients undergoing ECT would facilitate detection of common risk enhancing medical comorbidities. But these are not mandatory. Similarly, Electrocardiogram (ECG) and X-ray chest would be indicated in certain patients with medical comorbidities.

Further investigations shall be based on necessities as suggested by findings in physical evaluation.

<u>Treatment Procedure</u>

Modified Electroconvulsive therapy is mandatorily used as per the existing regulations in India. The modification involves using muscle relaxants to reduce the neuromuscular injuries and using anaesthetic agents to induce amnesia for the procedure involving muscle relaxation and electrical stimulation.

Table: Preparation for ECT procedure

a) Procedure has to happen in fasting condition with last intake of clear liquids of minimum 2hours, milk and light meals of 6 hours and fried food, fatty food or meat over 8 hours. b) Head should be dry and clean for the procedure. c) **Medications that should not be avoided before the procedure:** Morning doses of scheduled medications like antihypertensives,

thyroxine, antiemetics, anti-reflux, antianginal, bronchodilators and anticholinergics should not be withheld and can be taken orally 2 hours before the procedure with a sip of water.
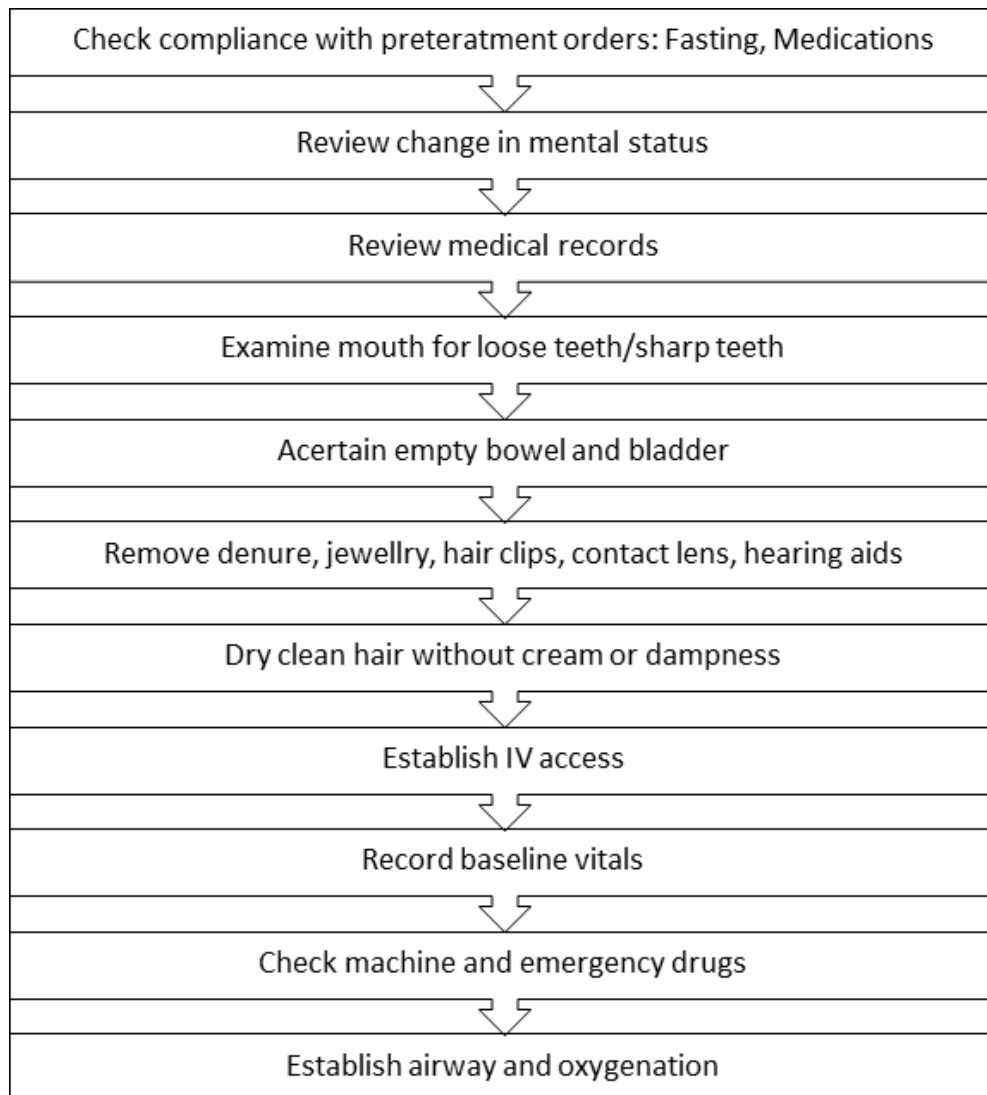
d) **Medications that should preferably be avoided before the procedure:** Morning dose of oral hypoglycemics, lithium, diuretics, anticonvulsants, theophylline and benzodiazepines can be withheld and requirement should be considered only on individual bases.

a. Anaesthesia

i. Preparation before anaesthesia

Figure: Steps of Pre-anaesthesia preparation

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┌─────────────────────────────────────────────────────────────────┐
│      Check compliance with preteratment orders: Fasting, Medications │
├─────────────────────────────────────────────────────────────────┤
│                              ⇩                                    │
├─────────────────────────────────────────────────────────────────┤
│                  Review change in mental status                  │
├─────────────────────────────────────────────────────────────────┤
│                              ⇩                                    │
├─────────────────────────────────────────────────────────────────┤
│                     Review medical records                       │
├─────────────────────────────────────────────────────────────────┤
│                              ⇩                                    │
├─────────────────────────────────────────────────────────────────┤
│             Examine mouth for loose teeth/sharp teeth            │
├─────────────────────────────────────────────────────────────────┤
│                              ⇩                                    │
├─────────────────────────────────────────────────────────────────┤
│                Acertain empty bowel and bladder                  │
├─────────────────────────────────────────────────────────────────┤
│                              ⇩                                    │
├─────────────────────────────────────────────────────────────────┤
│     Remove denure, jewellry, hair clips, contact lens, hearing aids │
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│                              ⇩                                    │
├─────────────────────────────────────────────────────────────────┤
│              Dry clean hair without cream or dampness            │
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│                              ⇩                                    │
├─────────────────────────────────────────────────────────────────┤
│                       Establish IV access                        │
├─────────────────────────────────────────────────────────────────┤
│                              ⇩                                    │
├─────────────────────────────────────────────────────────────────┤
│                      Record baseline vitals                      │
├─────────────────────────────────────────────────────────────────┤
│                              ⇩                                    │
├─────────────────────────────────────────────────────────────────┤
│                Check machine and emergency drugs                 │
├─────────────────────────────────────────────────────────────────┤
│                              ⇩                                    │
├─────────────────────────────────────────────────────────────────┤
│                Establish airway and oxygenation                  │
└─────────────────────────────────────────────────────────────────┘
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The procedure will be anxiety provoking. So, encourage and reassure patients while initiating procedure including while securing iv access and placing mask for oxygenation.

ii. Ideal anaesthetic agent for ECT should be rapidly inducing, short acting (early emergence from effects of anaesthesia), has good amnesic effect, stable systemic/cerebral hemodynamics during ECT and should not have any effects on seizure threshold.

Table: Summary of critical properties of anaesthesia agents in choosing for ECT (Kadiyala, 2017)

Seizure Threshold: Proconvulsant -> neutra -l> anticonvulsant	Etomidate > Ketamine > Methohexital > Sevoflurane > Thiopentone > Propofol.
Heart rate (HR): Reduce -> Increase HR	Propofol > Etomidate > Thiopentone > Methohexital > Ketamine
Mean arterial pressure (MAP): Reduce -> Increase HR	Propofol > Thiopentone > Methohexital > Etomidate > Ketamine
Emergence time Shortest to Longest	Sevoflurane > Propofol > Methohexitone > Thiopentone > Etomidate > Ketamine

Table: Choosing anaesthetic agents

Sr No	Inducing agent	Seizure quality	Advantages	Disadvantages
1.	**Propofol** (0.75-1mg/kg)	Shortest duration Increase seizure threshold	Better hemodynamic stability in patients with cardiovascular risks Quicker emergence	Pain on injection
2.	**Etomidate** (0.15-0.3mg/kg)	Duration prolonged May reduce seizure threshold	In patients with high seizure threshold	Hyperdynamic response more pronounced Longer emergence time Adrenocortical suppression
3.	**Methohexital** (0.5-1mg/kg)	'Gold standard'	Long history of use	Sparse availability in market; increasing lack of familiarity with use
4.	**Thiopentone** (3-5mg/kg)	Duration reduced; better than propofol	Faster acting agent	Increased risk of arrhythmias

5.	**Ketamine** (0.5-3mg/kg)	Unclear— Modest seizure enhancing effect	In patients with high seizure threshold Sedative and analgesic	Emergence phenomena Reduced hemodynamic stability, Increased intracranial pressure Questionable amnesia
6.	**Sevoflurane** (Inhalation)	Comparable with thiopental	Difficult venous access Better hemodynamic stability Pregnancy: Reduces uterine contraction Enhances muscle relaxation	Special equipments required Time-consuming QT prolongation

A combination of propofol and ketamine called Ketofol can be used to balance seizure duration and hemodynamic effects.

Adjunctive short acting Opiates (Remifentanyl, Alfentanil, Fentanyl) or Dexmedetomidine have dose-sparing effects and can be used. But they need more evidence on their exact role in ECT.

The differential effects of anaesthetic agents are dependent on dose and need to be considered while choosing anaesthetic agent.

iii. Muscle relaxation is an important component of modified ECT. Ideal muscle relaxant should have the ability to avoid musculoskeletal injury without affecting the cerebral seizure activity and provide rapid recovery without residual paralysis.

Succinylcholine (0.3-1mg/kg) is a preferred muscle relaxant due to its rapid onset and recovery.

Non-depolarising muscle relaxant may be considered in certain conditions: Pseudocholinesterase deficiency, organophosphorus poisoning, severe widespread burns, hypercalcemia, severe neuromuscular disease/injury (quadriplegia, amyotrophic lateral

sclerosis, muscular dystrophy), history of malignant hyperthermia in patient/family. In a patient with suspected/known history of recent (4 weeks) suicide attempt and referred to ECT, a high suspicion of organophosphorous poisoning should be considered. There are reports of prolonged apnea even after 4 weeks of poisoning. Clinicians should consider assessment of pseudocholinesterase level when in doubt or use of non-depolarising agents.

Pseudocholinesterase level can be assessed in patients with high suspicion (eg. patient belonging to Arya Vysya community, an earlier history of prolonged apnea) Routine determination of pseudocholinesterase level is not recommended.

Routine prophylactic use of anticholinergics (atropine/glycopyrrolate), beta-blockers, calcium channel blockers, nitrates, hydralazine and ganglionic blockers for cardiovascular stability is not recommended. Wherever used, the rationale for using such an agent should be noted.

b. ECT Dosing

The protocol of ECT varies considerably and choice on the protocols should be based on individual needs of a given patient. The rapidity of needed response, effectiveness, and potential cognitive adverse effects of the protocols should guide the choice.

Rather than any set of protocols, it is important to have knowledge of each parameter in the protocol and personalisation of protocol can be done based on patient needs.

i. Electrical Parameters

Brief or ultrabrief pulse is strongly recommended and should be administered with a constant current device. Sine-wave ECT and constant voltage systems are not recommended in modern practice of ECT due to safety concerns.

Electrical charge is generally considered as a linear measure and chief parameter of dosing. But this approach is faulty and the combination of electric current intensity, pulse width, pulse frequency and train duration (number of pulses) along with electrode placement (stimulation site), frequency of sessions and duration of session should be carefully considered in choosing a protocol.

Electrical current intensity: Historically 500-1000mA has been used in practice of ECT. Most devices come with a default current of 800-900mA. The current intensity is known to linearly

correlate with tolerability, cognitive as well as seizure quality but is generally kept constant and not modified during dose incrementation. Recently, low amplitude (200-400mA) is being explored as part of individualised low-amplitude seizure therapy. The clinical utility is yet to be understood.

Pulse width: ECT is classified as brief pulse (0.5-2 ms) and ultrabrief pulse (0.2-0.4ms). Smaller pulse width is shown to have linear effect on cognitive adverse effects. Ultrabrief pulse of 0.3 ms has clearly shown to have advantage over brief pulses. But the effectiveness also gets compromised with ultra brief pulse. Lower range of brief pulse (0.5-1ms) is considered to be optimal to obtain rapid clinical effect. But when cognitive adversities are of major concern ultra-brief can be chosen.

Pulse frequency: Number of biphasic pulses every second is the electrical parameter that is inverse of inter-pulse interval. It is an important electrical parameter that generally ranges from 20-240pulses/second (10-120Hz ie., bidirectional pulse pair per second). Though the pulse frequency is linearly related to the charge, it is inversely related to the seizure threshold and seizure quality. Seizure could be elicited better at a lower frequency than higher frequency when other ECT parameters are kept constant. That also means a lower charge will be able to elicit seizure at a lower frequency but would need higher total charge for higher frequency. Many ECT devices in default increment method involve increase in frequency.ECT clinicians should take appropriate clinical decisions based on available knowledge base regarding the impact of pulse frequency on efficiency of the stimulus dose.

Train duration: This is the most commonly modified parameter to set the dose. Generally pulse duration is limited by the devices. Most devices have a range of 0.2sec to 8 sec. But certain devices come with the highest limit upto 16 seconds. There is no safety limit on the highest duration that has been examined/recommended (https://www.tandfonline.com/doi/full/10.1080/08039488.2021.1946590). An increase in charge is always achieved by increasing train duration till the upper limit of the device is reached.

Number of pulses: It is directly a factor of train duration and will also be influenced by pulse frequency. Hence, the number of pulses though intuitively suggests to directly correlate with seizure. But as "crowding of pulses" is not efficient in eliciting seizure, the number of pulses by itself may not be a good indicator for setting electrical parameters.

Directionality: The default ECT parameter widely applied is bidirectional current. There are certain trials of unidirectional current - anodal at one site and cathodal at the other is being examined. But evidence is limited to suggest clinical utility of unidirectional current.

Patterned doses: Bursts of pulses are provided similar to theta bursts in magnetic stimulation. The available evidence is for continuous pulses with similar intervals which is supported by most commercially available devices. Currently patterned pulses cannot be recommended for routine clinical application.

      ii.   Electrode placement

The electrodes are placed in different ways:

1. Bilateral:
   a. Bitemporal: Classical method. Electrode placed in frontotemporal region (one inch above imaginary line joining outer canthus and external auditory meatus).
   b. Bifrontal: Electrodes placed on frontal regions (2 inches above outer canthus on an imaginary vertical line perpendicular to the imaginary line joining two pupils). Clinical trials have shown bifrontal is equally if not more effective than bitemporal placement, but with lesser cognitive effects in patients with mania, depression as well as schizophrenia.
   c. Left anterior right temporal: Asymmetrical placement of electrodes with left side on frontal region and right on frontotemporal regions is reported. Evidence from systematic studies is lacking (https://pubmed.ncbi.nlm.nih.gov/24831996/).
2. Unilateral:
   a. Right unilateral (RUL): One electrode is placed on the right frontotemporal region and other electrode one inch right to vertex (point of crossing of two imaginary lines one joining two tragi and other joining nasion-inion). This is shown to be having lesser cognitive adversities but require nearly 6 times the threshold dose for efficacy equalling bilateral.

b. Left unilateral: Same as RUL on the left hemisphere. Thai has found to be equi-efficacious to RUL. This placement can be chosen when sparing of non-verbal and visual memory is needed more than sparing verbal memory. Also would be chosen in those having right dominant brain function. (https://pubmed.ncbi.nlm.nih.gov/28422271/)

The evidence for efficacy of unilateral ECT is available only for depression. The evidence of unilateral ECT is lacking for other common indications (namely schizophrenia or mania).

iii. Dose of ECT

ECT dosing is discussed in terms of charge (milliCoulombs,mC). Higher charge is associated with better efficacy and higher cognitive adverse effects. But as discussed in the earlier section, charge is not a linear measure but a combination of multiple electrical parameters.

Electrical charge= Current intensity x Pulse width x Pulse frequency x train duration

The total dose for an optimal efficacy through repeated ECT sessions is considered with respect to seizure threshold and is found to also rely on the pulse width and electrode placement.

Marginally suprathreshold charge (1.5xSeizure Threshold) is needed in bilateral (BT/BF) ECT in brief pulse ECT (pulse width of 1ms or more).

Some evidence suggests a requirement of higher charge (2.5xSeizure Threshold) when a lower range of brief-pulse (0.5ms) in bilateral ECT.

Strong evidence suggests a markedly supra-threshold (6 x seizure threshold) is required for ultrabrief (0.3ms) ECT with evidence available for primarily RUL ECT.

RUL ECT (ie., with pulse width of 1ms) is found efficacious at markedly suprathreshold (6xST) dose and may not provide added advantage to Bilateral ECTs.

Ultra-brief bilateral (BF/BT at 0.3ms) are found to be ineffective or with significantly lesser response rate and may not be advisable with the existing evidence.

Ideally the dose increment has to happen for a fixed current amplitude, pulse frequency and pulse width. Hence, the suprathreshold dose should also be a function of train duration. But most of the standard devices have limitation of train duration at 4-8sec in default settings and they increase pulse frequency to increase the total duration. Most studies have used these default increments and hence this guideline should be read with caution. More studies are needed to ascertain this need.

Dose estimation methods
(https://www.tandfonline.com/doi/full/10.1080/08039488.2021.1946590):

1. Stimulus titration method: This will be the recommended method in regular practice. The first session can be spared in finding the lowest dose needed for seizure threshold estimation. Formula based methods can be used as guidance for identifying the first dose of titration. Faster titration with higher increments may be attempted in elderly patients and slower titration with smaller increments may be attempted in adolescents/younger adult patients. Subsequent sessions can be provided at suprathreshold doses as discussed above.

2. Formula based methods: Based on age and sex of the patient different formulae are derived. Need to be cautious in using the formula- to be derived in the Indian patient population, external factors like skull shape/size, medications/anaesthesia agents impacting seizure threshold should be considered. The formula should be used with the same amplitude, pulse width, pulse frequency, electrode location and with which it was derived.

3. Fixed high dosing: Using a single high dose for all the sessions. Use of a high fixed dosing strategy should be reserved only for patients with sufficiently serious concomitant medical conditions in which avoidance of subconvulsive stimulation is a priority

4. Dosing from benchmark: A high dose will be administered at the first session. The peak heart rate and tonic-clonic convulsions would be observed. In subsequent sessions the doses are down-titrated to continue at the lowest dose producing a similar outcome. This could be a better alternative to continued fixed high dosing method, wherever it is used.

c. Procedure and Monitoring
   i. ECT procedure

Seizure monitoring:

Hamilton cuff method is recommended for monitoring motor seizures by isolating the ipsilateral limb (right limb in RUL ECT) from muscle relaxants.

EEG gives a direct measure of seizure activity and is recommended wherever available. Bilateral EEG recording from at least two channels (FP1 and FP2) referenced to the ipsilateral mastoid is preferred. When only a single channel is available, a contralateral channel is preferred.

EEG recording can have artefacts due to muscle movements and other technical issues. Hence, motor monitoring should always be used to supplement EEG.

<u>Adequate seizure</u>

- Good quality seizure should be given more importance than any specific duration. A good quality seizure even of shorter durations has been demonstrated to be efficacious in elderly depression patients.
- Earlier definition of 15 seconds of motor seizure and 25 seconds of EEG seizure as inadequate seizure is found not to be of clinical or prognostic benefit.
- Good quality motor seizure involves gradual seizure induction, tonic contraction, bilateral convulsions that end gradually, and succeeds by comatose stage with gradual reorientation.
- Hamilton cuff method of isolation and monitoring of convulsion in ipsilateral limb is preferred in modified ECTs, as it indicates generalisation of seizures.
- Time from the end of ECT stimuli till the end of the last clonus in any part of the body (usually ends in the limbs) shall be considered for motor seizure duration.
- Good quality of EEG seizure involves visualisation of seizure activity in contralateral channels.
- Good quality EEG seizure will have 4 phases:
    - Phase 1: Recruitment stage involving high frequency waves with gradually increasing amplitude.

- - Phase 2: Hypersynchronous high amplitude polyspike bursts at around 10Hz lasting 10-20 seconds corresponds to tonic contraction
  - Phase 3: Hypersynchronous polyspikes intermixed with slow waves for 20-40 seconds corresponds to tonic-clonic phase
  - Phase 4: Postictal suppression- a flat isoelectric line is seen. Onset of this phase heralds the end of seizures
  - Phase 5: Recovery from delta to theta to alpha waveform.
- Good visualisation of EEG is possible in younger patients compared to elderly patients.

If missed seizure (no motor / EEG seizure even after 20 seconds of electrical stimuli), re-stimulate by increasing the dose. Watch for any delayed onset seizure.

If inadequate seizure (non-generalized - one side of body, restricted to facial region and low-quality EEG seizures) noted, re-stimulate after 45 seconds.

If stimulation is of 5-10 seconds duration, then restimulate only if the patient has not yet shown a clinical response (ie., in the early course of ECT or no response noted with repeated short duration seizure).

Restimulate till the patient comes out of anaesthesia/muscle relaxant. If needed, re-induction or "top-up" dose can be provided in concurrence with anaesthetist. But top-up doses can reduce the quality of seizures. Generally, 4-5 restimulations can be attempted.

Restimulation on the same day after adequate seizure called Multiple monitored ECT (MMECT) is not recommended. Even in cases of unilateral ECT markedly supra-threshold stimulation would not be necessary on the first day of titration. This might be considered only extremely rare life-saving conditions like neuroleptic malignant syndrome and intractable seizures.

If prolonged seizure (seizure longer than 180 seconds): Start acting to terminate if extending beyond 120 seconds. Airway and respiration should be closely monitored till complete cessation of seizure. Terminate using benzodiazepines, phenytoin, valproate or barbiturate (anaesthetic used for induction, if it is an anticonvulsant, can be used). Review medications for presence of theophylline and lithium. Consider shifting to

anticonvulsant anaesthetic agents. Avoid prolonged seizure leading to status epilepticus (30 minutes/ 2 seizure attacks without gaining consciousness in between).

ii.   Monitoring in the recovery room

- Vitals monitoring to be continued: pulse rate, blood pressure and oxygen saturation.
- ECG to be monitored in high-risk patients (history of cardiac disease)
- Monitor for agitation/delirium, aspiration, arrhythmia, tardive seizure, enuresis/encoperesis and neuroleptic syndrome. Avoid feeding until full consciousness returns.
- Evaluate for any adversities during the procedure: tongue bite/mucosal injury, musculoskeletal injuries (fractures, dislocations),
- Assess orientation and gait for recovery to baseline or near baseline before discharging from the recovery room.

iii.   During the course of ECT treatment

Number of ECTs should not be predetermined but should be based on the needs of individual patients.

Minimum weekly monitoring of progress in terms of clinical symptoms, and cognitive and other adverse effects should be done during the course of ECT.

If clinical improvement/remission is achieved ECT should be terminated sooner than later.

If clinical improvement is not observed, minimum 8-12 ECT sessions should be provided in acute courses before considering resistance to ECT. Longer course may be needed in some slow responders and this decision to continue more than 12 sessions should be taken after a risk-benefit analysis. In general, the response to ECT is seen after more sessions than in depression and mania.

Monitor clinical improvement: A clinical indication specific structured symptom rating tool can be used weekly for assessment wherever feasible. A clinical assessment is a must after every ECT, preferably 24 hours after the ECT session but before the next session.

Monitor adverse effects: ECT specific cognitive assessment tools can be used. Montreal cognitive assessment battery (MoCA), brief ECT cognitive screen, Battery for ECT related cognitive deficits" B4ECT Recode can be used serially during the course of ECT.

1. It should be noted that there could be improvement in some cognitive functions with improvement in clinical symptoms.
2. Retrograde amnesia is one of the most potential adverse effects which is difficult to measure using objective cognitive tests.
3. Subjective assessment of memory impairment should be given due importance alongside objective assessment, and should be a part of routine cognitive assessment.
4. Also consider the following situation that led to higher subjective rating:
   - Cognitive decline could be a part of natural course of illness
   - May reflect objective loss of function rather than cognitive abilities
   - May be associated with increase in psychopathology or improvement in insight

<u>Continuation and maintenance ECT</u>

ECT can be used as a continuation-phase treatment (upto 6 months of remission) for consolidation of effects and maintenance treatment (after 6-months of treatment) as prophylaxis in major depressive disorder, bipolar disorder and schizophrenia.

Acute courses (of 2-3session/week), if effective, can be gradually tapered down to twice a week to weekly, fortnightly and monthly. The tapering and frequency of continuation should be tailored to the individual patient's clinical needs.

The course should not be prefixed but should be dynamic and scheduled based on periodic clinical review.

After 6 months of continuation based on clinical needs, maintenance ECT may be planned. It is usually given at a frequency ranging from one session every 1-12 weeks. Alternative pharmacological, psychological interventions should be considered for risk-benefit analysis while planning maintenance treatment.

Management of adverse effects

Frequent inadequate/missed seizures or prolonged seizures:

- EEG monitoring is advisable in such patients for subsequent sessions
- Recheck the treatment chart for electrolyte disturbances, seizure history and use of pro/anticonvulsants, past traumatic brain injury, hypoxia in the past, pregnancy.
- Reconsider anaesthesia dose/agent based on its effects on convulsions.
- Vigorous hyperventilation and pre-oxygenation if inadequate missed seizure. Avoid the same in prolonged seizure
- Change to lower pulse frequency, lower session frequency, unilateral ECT in case of missed/inadequate seizures.
- Consider dose reduction in case of recurrent prolonged seizures. Be aware that seizure duration would be highest near the threshold dose. Hence, dose increment would also benefit in certain situations (eg., prolonged seizure noted after incremental doses using stimulus titration method).

Tardive seizure: Seizures may happen within hours of an ECT session. Look for secondary causes of seizures. Be cautious of non-motoric manifestation of tardive seizures and abort such seizures using anticonvulsant medicines.

 Post-ictal confusion/delirium: Generally patients will get reoriented within 5-45 minutes after adequate seizure. If confusion, poor response to commands with or without behavioural agitation continues after this period or severe enough during this period consider supportive intervention.

Secure the patient in a safe environment, and ensure airway, breathing, and circulation (secure iv line from getting damaged). Reduce environmental stimuli and gentle temporary physical restraint if necessary to prevent the patient harming himself. Consider iv benzodiazepines or anaesthetic agents if persisting/severe agitation. Administer low dose antipsychotic (eg

Haloperidol im 2-5 mg with repeated dose if necessary) if the benzodiazepines are not effective.
Evaluate for physical conditions- electrolyte imbalance, infections in recurrent postictal delirium.
Non-convulsive prolonged seizures, status epilepticus or tardive seizure should be considered
as differential diagnosis. Prophylactic higher dose of anaesthetic/muscle relaxant agents or
benzodiazepines before onset of syndrome may be considered in recurrent postictal delirium.

Cognitive adverse effects:

Consider one or more below mentioned steps. But the decision should be taken balancing with
the possible reduction in effectiveness with these methods.

1. Spacing of ECT sessions
2. Switching to unilateral ECT
3. Switching to briefer pulse width
4. Reduction of stimulus dose.
5. Medications like lithium (serum levels>0.6meq/l) that are known to affect cognition may
   be reduced or stopped.
6. Dose of anaesthesia may be reduced if given in higher doses that may contribute to
   amnesia and delayed reorientation.
7. Termination of ECT may be considered if risks outweigh the benefits.

Pain: May manifest as headache, muscle soreness, joint pains.

Headache: generally mild. If severe analgesics like Paracetamol, Aspirin or NSAIDs can be
used.

Muscle soreness: Can be handled similar to headache. Generally, will be intense after the first
session and would not be much with later sessions. Intense fasciculations with Succinylcholine

could contribute to muscle soreness. Reduction of dose or change to other muscle relaxant can be considered

Joint pain: Generally, pterygium/masseters. Firm holding of jaws during the stimulus would reduce the risk. Examine for dislocations and relocate using appropriate manoeuvres in such situations.

Nausea/Vomiting: Generally associated with headache and responds to analgesics. If severe, butyrophenones, phenothiazines, metoclopramide relieves nausea. Ondansetron may be used as next line agents.

Treatment emergent mania: ECT may be continued or frequency may be reduced based on clinical needs.

Phobia and anxiety towards ECT:

Given the opportunity to express the apprehensions, concerns and questions of patients and family. Provide information and fact sheets supplementing consent form. Video materials can be a value addition to this.

Group sessions of patients and family members/care-givers including those who had recently ECTs would enhance mutual support and education.

Address concerns with active intervention like awareness during ECT procedure by increasing anaesthesia dose, adequate support during postictal phases of recovery and so on.

Special population

Children and adolescents:

- No evidence for differential efficacy or safety in child and adolescent group compared to adults
- Regulations in India prohibit use of ECT in minors (</=18 years). It mandates pre-approval from the mental health review board to administer ECT under dire needy situations in this population. Considering two psychiatrists' opinions would be beneficial. Choose ECT after other options are attempted or considered.
- Prolonged seizures are commoner in this age group- avoid proconvulsant/neutral anaesthetic agents (avoid Etomidate, Ketamine).

Pregnancy:

- ECT is safe and effective in pregnancy and is preferred option given lesser risk of teratogenicity compared to many psychotropics
- Consider ECT weighing the risk against other treatments and no treatments. The risk evaluation should be a joint activity of psychiatrist, anaesthesiologist and obstetrician.
- Few general additional steps in pregnancy (most applicable in 2nd and 3rd trimester)
  - Maintain hydration while fasting. Actively use IV fluids if any signs of dehydration are noted.
  - Left lateral or Pelvic tilt to be provided to maintain aorto-caval circulation
  - Provide preoxygenation but avoid hyperventilation to avoid hypertensive crises
  - Consider premedication with H2 blocker/antacids to reduce risk of aspiration. Avoid routine anticholinergic premedication even though it would reduce risk of foetal arrhythmias (Atropine may be useful in initial dose titration session).
  - Doppler or cardiotocography monitoring from before, during and after ECT for foetal monitoring along with the maternal vital monitoring as per regular standards.

- ○ ECT after 20 weeks of gestation would be preferable in the setting with availability of obstetric support. Ensure availability of tocolytics and preferably tocodynamometer to handle any risk of labour induction/ abortion.

Elderly:

ECT is safe and effective in elderly. Evidence suggests a higher response rate of elderly depression than that in the mixed age group population. Cognitive adverse effects would be concerned primarily when ECT is indicated for dementia related behavioural disturbances. Risks of high seizure threshold, missed seizures, medical comorbidities and postictal delirium are higher in old age.

General consideration in older age:

- Avoid propofol as anaesthetic agent and reduce/stop anticonvulsants.
- Minimise non-convulsive shocks, higher initial dose and faster increments can be considered.
- RUL or BF would be preferred electrode placement to BT ECT. Lower range of brief or ultrabrief pulse may also be considered.
- Avoid concomitant high dose lithium (>0.6mq/l) due to higher risk of postictal delirium.
- Interdisciplinary medical management and close monitoring would be often necessary with high rates of comorbidity.

Medical comorbidities:

Table: Special steps on ECT in patients with medical comorbidities

Cardiac disease	- Assess risk-benefit - Use multidisciplinary approach - Assess functional cardiac capacity (2D Echocardiogram or proxy using staircase to climb) - MI: Wait for 4-6 weeks of MI - Valvular diseases: Cardiologist consultation - Decompensated CHF: optimise medications - First degree relative heart disease: anticoagulation - Pacemakers/cerebral implants
Endocrine	- Evaluate for the status of the diabetes mellitus, hypothyroidism and other known endocrine disorder in a given patient - Avoid hypoglycemic agents before ECT during fasting - Uncontrolled hypothyroidism may lead to delay in recovery - Steroids may be needed just before ECT in Addison's disease to maintain stress reaction
Cerebral	- Recent ischemic /hemorrhagic stroke and Symptomatic intracranial mass warrant ECT postponement - Neurologist consultation in asymptomatic cases - Depolarising muscle relaxants to be avoided in MS
Renal	- Adequate muscle relaxation is necessary - Hypoventilation can lead to respiratory acidosis, hyperkalemia and further acid-base imbalance. - Hemodialysis patients: Potassium levels done before 24hrs of ECT
Pulmonary	- Asthma and COPD: careful monitoring of oxygenation - Morning medications can be taken before ECT - Avoid hyperventilation in COPD: delayed awakening, decreased respiratory drive - Theophylline to be discontinued 24 hrs before ECT: risk of prolonged seizures

COVID-19 (Corona Virus Disease) related precautions

ECT is an aerosol generating procedure. Certain additional precautions to curtail the spread of COVID and may be taken as per risk assessment by clinicians.

Table: Special precautions during COVID pandemic

1. Atropine/Glycopyrrolate can be used to reduce oral secretions
2. High Efficiency Particulate Air (HEPA) filters, reusable masks, heat moisture exchanges can be used during ventilation
3. Use of appropriate Personal Protective Equipment (PPE)
4. Posting patients with suspected COVID at the end of the ECT day.

5. Administering ECT in isolation wards for patients known to have active COVID.

References:

1. A.Shyam Sundar, Biju Viswanath, Bangalore N. Gangadhar, C. Naveen Kumar, Jagadisha Thirthalli, Muralidharan Keshavan, Preeti Sinha, Shivarama Varambally, Urvakhsh M. Mehta. Handbook of Electroconvulsive Therapy. Bangalore: NIMHANS, 2015.

2. Abrams Richard ed. Electroconvulsive therapy. Fourth Edition. New York: Oxford University Press, 2002.

3. American Psychiatric Association. The Practice of Electroconvulsive Therapy-Recommendations for Treatment, Training, and Privileging (A Task Force Report of the American Psychiatric Association) Second Edition. Washington, DC: American Psychiatric Press, 2001.

4. Andrade C. Dose calculation with brief-pulse ECT demystified. Indian J Psychiatry. 2010 Jul;52(3):276-8. doi: 10.4103/0019-5545.70995. PMID: 21180417; PMCID: PMC2990832.

5. Andrade C, Arumugham SS, Thirthalli J. Adverse Effects of Electroconvulsive Therapy. Psychiatr Clin North Am. 2016 Sep;39(3):513-30. doi: 10.1016/j.psc.2016.04.004. Epub 2016 Jun 25. PMID: 27514303.

6. Bergsholm P, Bjølseth TM. Dosing methods in electroconvulsive therapy: should the Scandinavian time-titration method be resumed? Nord J Psychiatry. 2022 Apr;76(3):170-176. doi: 10.1080/08039488.2021.1946590. Epub 2021 Aug 1. PMID: 34338117.

7. Ferrier, I., & Waite, J. (Eds.). (2019). The ECT Handbook (4th ed.). Cambridge: Cambridge University Press. doi:10.1017/9781911623175

8. Gill, SP, Kellner, CH (2018) Clinical practice recommendations for continuation and maintenance electroconvulsive therapy for depression: outcomes from a review of the evidence and a consensus workshop held in Australia in May 2017. Journal of ECT 35: 14–20.

9. Gill, SP (2018). A review of evidence of 0.5ms pulse width ECT. SEN Conference, 2018 retrieved from https://www.ranzcp.org/RANZCP/media/Conference-presentations/Section%20of%20Electroconvulsive%20Therapy%202018/Shane-Gill.pdf. On 10th july 2022.

10. Grover S, Sahoo S, Rabha A, Koirala R. ECT in schizophrenia: a review of the evidence. Acta Neuropsychiatr. 2019 Jun;31(3):115-127. doi: 10.1017/neu.2018.32. Epub 2018 Dec 3. PMID: 30501675.

11. Kellner CH, Farber KG, Chen XR, Mehrotra A, Zipursky GDN. A systematic review of left unilateral electroconvulsive therapy. Acta Psychiatr Scand. 2017 Aug;136(2):166-176. doi: 10.1111/acps.12740. Epub 2017 Apr 19. PMID: 28422271.

12. Kellner CH, Obbels J, Sienaert P. When to consider electroconvulsive therapy (ECT). Acta Psychiatr Scand. 2020 Apr;141(4):304-315. doi: 10.1111/acps.13134. Epub 2019 Dec 23. PMID: 31774547.

13. Lamy S, Bergsholm P, d'Elia G. The antidepressant efficacy of high-dose nondominant long-distance parietotemporal and bitemporal electroconvulsive therapy. Convuls Ther. 1994 Mar;10(1):43-52. PMID: 8055292.

14. Leroy A, Naudet F, Vaiva G, Francis A, Thomas P, Amad A. Is electroconvulsive therapy an evidence-based treatment for catatonia? A systematic review and meta-analysis. Eur Arch Psychiatry Clin Neurosci. 2018 Oct;268(7):675-687. doi: 10.1007/s00406-017-0819-5. Epub 2017 Jun 21. PMID: 28639007.

15. Mitra S, Thirthalli J. ECT in Schizophrenia: Does indication affect the outcome? Asian J Psychiatr. 2018 Feb;32:5-7. doi: 10.1016/j.ajp.2017.11.035. Epub 2017 Nov 28. PMID: 29197710.

16. Peterchev AV, Rosa MA, Deng ZD, Prudic J, Lisanby SH. Electroconvulsive therapy stimulus parameters: rethinking dosage. J ECT. 2010 Sep;26(3):159-74. doi: 10.1097/YCT.0b013e3181e48165. PMID: 20805726; PMCID: PMC2933093.

17. Phutane, V, Thirthalli, J, Muralidharan, K (2013) Double-blind randomized controlled study showing symptomatic and cognitive superiority of bifrontal over bitemporal electrode placement during electroconvulsive therapy for schizophrenia. Brain Stimulation 6: 210–217.

18. Sharma E, Kommu JVS. Mental Healthcare Act 2017, India: Child and adolescent perspectives. Indian J Psychiatry. 2019 Apr;61(Suppl 4):S756-S762. doi: 10.4103/psychiatry.IndianJPsychiatry_126_19. PMID: 31040469; PMCID: PMC6482686.

19. Thirthalli, J, Harish, T, Gangadhar, BN (2011) A prospective comparative study of interaction between lithium and modified electroconvulsive therapy. The World Journal of Biological Psychiatry 12: 149–155.

20. Weiner RD, Lisanby SH. New directions in the rational design of electrical and magnetic seizure therapies: individualized Low Amplitude Seizure Therapy (iLAST) and Magnetic

Seizure Therapy (MST), International Review of Psychiatry. 2017 29:2, 63-78, DOI: 10.1080/09540261.2017.1304898

21. Weiner RD, Reti IM. Key updates in the clinical application of electroconvulsive therapy. Int Rev Psychiatry. 2017 Apr;29(2):54-62. doi: 10.1080/09540261.2017.1309362. Epub 2017 Apr 13. PMID:28406327.

22. Weiss A, Hussain S, Ng B, Sarma S, Tiller J, Waite S, Loo C. Royal Australian and New Zealand College of Psychiatrists professional practice guidelines for the administration of electroconvulsive therapy. Aust N Z J Psychiatry. 2019 Jul;53(7):609-623. doi:10.1177/0004867419839139. Epub 2019 Apr 10. PMID: 30966782.

23. Weiss AM, Hansen SM, Safranko I, Hughes P. Effectiveness of left anterior right temporal electrode placement in electroconvulsive therapy: 3 case reports. J ECT. 2015 Mar;31(1):e1-3. doi: 10.1097/YCT.0000000000000136. PMID: 24831996.

The Indian Psychiatric Society-Clinical Practice Guidelines for the use of repetitive transcranial magnetic stimulation in psychiatric disorders

INTRODUCTION

Psychopharmacology and psychotherapy form the mainstay of treatment in psychiatric disorders. Despite advances in both the forms of treatments and their strategies, 20-60% of patients with psychiatric disorders do not respond.[1] This treatment non-response, which is now recognized across the whole range of psychiatric disorders, leads to greater healthcare burden. Moreover, poor adherence, which is related to the stigma attached to psychopharmacological agents, their side-effect profiles and poor feasibility in following psychotherapy sessions, contributes to poor treatment outcomes, specifically termed as 'pseudo-resistance'.[1] On a background of this, and also in the wake of technical advances in the field of basic neurosciences, newer forms of treatments have been developed and investigated. One of such newer treatments is the use of repetitive transcranial magnetic stimulation (rTMS).

rTMS is a non-invasive, non-convulsive method of brain stimulation first described by Anthony Barker and his colleagues in 1985 and came to be used in clinical settings in 1990s. It refers to a multisession treatment where magnetic fields induced by recurring TMS pulses stimulate nerve cells in a particular brain region. It has a neuromodulatory effect on neuronal excitability and has been implied to have neuroplastic effects. The development of rTMS as a form of treatment is supported by a large number of clinical studies across psychiatric disorders. Since 2008, the US Food and Drug Administration (FDA) has so far cleared many equipments for therapeutic use of rTMS as an adjunctive treatment strategy in various conditions (see table below). [2]

<Insert Table 1 here>

Over the course of the last 2 decades, there has been a significant increase in interest in the use of rTMS and several forms of rTMS, various protocols, coils, target regions, etc, have been investigated. While high-frequency (>5/10Hz) and low-frequency (≤1Hz) stimulations are considered the conventional rTMS forms, patterned rTMS i.e., theta burst stimulation (TBS) and quadri-pulse stimulation (QPS) are the newer forms. Further, there are three sub-forms of TBS– intermittent TBS (iTBS), continuous TBS (cTBS) and intermediate TBS (imTBS). Several protocols- once daily, twice or more daily (also called as intensive or accelerated protocols), 3-5/week to once weekly, fortnightly or even once a month maintenance protocols are being investigated. Further, as many as 50 TMS coil designs are being examined.[3] Moreover, apart from the conventional target sites– dorsolateral prefrontal cortex (DLPFC) and the temporoparietal cortex (TPC), several new brain regions (cerebellum, orbitofrontal cortex (OFC), supplementary motor area (SMA), etc) including bilateral stimulations have been chosen to study the effects of rTMS in various psychiatric disorders.

Given the rising interest among psychiatrists for the use of rTMS in routine clinical practice, increasing availability of TMS equipment, an array of numerous choices in modes of rTMS delivery forms and increasing literature base for the use of rTMS in several psychiatric disorders,[4] even from India,[5] it is important to develop specific and up-to-date clinical practice guidelines (CPG). The Indian Psychiatric Society (IPS)- CPG for the use of rTMS in various psychiatric disorders intend to synthesize the emerging evidence based literature and

provide expert guidance for bringing consistency in the clinical application of rTMS. While we encourage practitioners to implement evidence based recommendation, we also deem that the use of rTMS in clinical practice can vary and depends upon the clinician's acumen and experience.

METHODS

Process of forming the CPG for use of rTMS

The IPS-CPG taskforce delegated a team of five experts for drafting the CPG for use of rTMS. The experts met at IPS state/zonal conferences and via online meetings and developed the recommendations and the draft. The recommendations were informed primarily by an umbrella review of recent meta-analytic studies assessing the role of rTMS in various psychiatric disorders performed by the authors and supplemented by other clinical practice guidelines,[6] evidence based guidelines and umbrella reviews[7-9] and consensus or expert recommendations.[10-12] The experts involved in developing the recommendations were also abreast of the GRADE (Grading of Recommendations, Assessment, Development and Evaluations) framework.

Umbrella review- Search strategy and Inclusion criteria

We performed an umbrella review of meta-analyses that have assessed efficacy and/or safety of various rTMS protocols in different psychiatric disorders.

We systematically searched the PubMed data base until July 15th, 2022 supplemented with manual searches. The search string used was "("rTMS") OR ("theta burst stimulation") OR ("Non Invasive Brain Stimulation")". We applied the "Meta-Analysis" filter and adjusted the "timeline" to 2018–2022 (i.e. last five years). This resulted in a total of 168 articles, that were further screened for the following inclusion criteria: i) meta-analysis of randomized controlled trials (RCTs); and ii) reporting on efficacy and safety of rTMS (including theta burst stimulation (TBS)) in psychiatric disorders, specifically a) cognitive disorders and dementia; b) substance use disorders; c) schizophrenia; d) depression (including unipolar depression, bipolar depression, peripartum depression, poststroke depression, post-traumatic brain injury depression, depression associated with Parkinson's disease); e) bipolar disorder; f) anxiety disorders; g) obsessive compulsive disorder (OCD) and related disorders; h) Post-traumatic stress disorder (PTSD); i) autism spectrum disorder (ASD); j) attention deficit hyperactivity disorder (ADHD); k) eating disorders; l) chronic pain disorders including headache and fibromyalgia; m) insomnia; n) chronic tinnitus; and o) essential tremors. We also included meta-analyses specifically aimed at assessing suicidality, impulsivity, empathy and borderline personality disorder. The Exclusion criteria we chose were i) study designs other than MA of RCTs, ii) no safety or efficacy data reported, iii) non-English articles. Studies that assessed other (non-invasive brain stimulation (NIBS) together with rTMS, or two conditions together or not having specifically defined a clinical condition and not having provided pooled statistics for rTMS separately for distinct disorders were also excluded.

Finally, 97 meta-analyses were reviewed. Only sham controlled pooled effect sizes were noted and included for synthesis. List of references for all the studies are submitted as supplementary material.

CLINICAL PRACTICE GUIDELINES

Who can provide rTMS?

Provision of rTMS sessions can primarily be understood as i) prescribing or advising rTMS treatment and ii) delivering rTMS sessions. These two personnel are termed "TMS physician" and "TMS operator". The "TMS physician" by definition is "a clinician with prescriptive privileges who is knowledgeable about, trained, and credentialed in rTMS"[8]. Moreover, they are essentially required to have an "extensive background in brain physiology that is obtained during residency training in psychiatry, neurology, or neurosurgery", and "a deep understanding about the neurophysiological effects of rTMS".[13] On the other hand, the "TMS operator" needs to be able to "recognize potentially serious changes in a patient's mental status and know when to alert an attending physician" and have been trained in recognizing and effectively responding to seizures.[10,13] Therefore, the "TMS operator" may be any non-medical personnel.

Training for providing rTMS treatment

The Indian Psychiatric Society (IPS) in collaboration with NIMHANS, Bengaluru and AIIMS New Delhi, has been conducting a series of annual training workshops in this regards. Other institutes such as the Central Institute of Psychiatry, Ranchi, and Kasturba Medical College, Manipal also are providing training in rTMS. In fact, recommendations for training in NIBS have also been put forth and they recommend training not only for clinicians but also for technicians and scientists.[14]

rTMS set-up and the device

An air conditioned suit with adequate space for the rTMS equipment including the participant sitting arrangement and space for storage of spare coils is an essential requisite. There should be enough space for the person delivering the sessions. Also, the rTMS suite must have a provision for participant waiting and a washroom. There has to be a provision for a powerful air conditioning unit to cool the coils, in case cooled-coils are not used.

The components of the rTMS device are:

1. Electronic Main Unit
2. Coil
3. Cooling unit and control cable for cooling unit
4. Power Supply Unit and its cables
5. EMG machine
6. Coil Holder
7. Computer system

A trolley for the machine and a flexible stand for fixing the coil in the right position near the seating set-up may be acquired. The sitting equipment must preferably be a comfortable recliner chair. Height of its back resting must allow for the coil to be placed for delivering stimulation. Disposable earplugs must be available for participants for each session. Skin marker and a measuring tape will be required for marking the target location.

Sample technical specifications for an rTMS device is given in table 2.

<Insert Table 2 here>

Patient inclusion and pre-rTMS evaluation

Informed consent has to be taken before the start of rTMS sessions and all the possible side effects and their probability have to be explained. Along with the psychiatric evaluation, detailed medical, treatment and neurological history has to be taken. Particularly, history of epilepsy (both in the patient and in the family), significant or recent traumatic brain injury, loss of consciousness, stroke, brain tumour or currently taking medication/s that lowers the seizure threshold should be specifically noted. If any of these are reported to be positive, then the patient has to be informed regarding the risk of a possible rTMS related seizure and patients risk-benefit ratio has to be determined.[10]

The pre-rTMS evaluation may be supplemented by the use of tools such as the TMS Adult Safety Screen (TASS)[15] or the screening standard questionnaire for rTMS candidates (table below) suggested by Rossi et al.[16]

<Insert Table 3 here>

Contraindications for the use of rTMS are:

1. Presence of implanted medical device that are ferromagnetic or magnetic sensitive or any such metal objects in the brain, head and neck areas.
2. Deep Brain Stimulation (DBS) where subcutaneous leads are placed in the scalp, etc. is also a contraindication, if coil position is <10cm away.
3. Any other metallic medical devices such as chips, pumps, pacemakers, cochlear implants, dental implants, permanent piercings and tattoos containing ferro-magnetic containing ink, if coil position is <10cm away.

X-rays may be helpful for screening but they cannot determine if the metals are ferromagnetic. Metallic implants below head and neck, such as knee or hip prosthesis is considered safe.[12]

Substance in the past one week, the day before the treatment sessions must be documented.

Current drugs and their doses, along with the total duration should be documented. Also any medication changes during the rTMS treatment course must be noted.

Patient preparation

The following may be ensured before commencing the rTMS treatment session:

- Adequate sleep (other than in cases of insomnia) has to be ensured.
- Also absence of any acute medical emergency including high fever, uncontrolled hypertension and elevated blood pressure, uncontrolled diabetes and hyperglycaemia, acute headache, acute vertigo/giddiness/dizziness, any fresh scalp/facial injury, etc has to be ascertained. Also ensure that the patient is cooperative and is not acutely violent, aggressive and suicidal.
- Use of alcohol, tobacco or any substance prior to the treatment session must be avoided.

Determining motor threshold

Determination of the motor threshold (MT) is a must for determining the stimulus intensity of rTMS. Ideally, it has to be measured before every session. However, for the sake of ease the MT and the stimulus intensity that is determined before the start of first session may be used for all subsequent sessions in the following one week. However in cases where the treatment sessions are lasting more than a week or given at an interval >1 week, MT (and therefore the stimulus intensity) has to be ascertained again. Also in cases where there are changes in medication doses or heavy intake of alcohol or any other substance 24 hours prior to the rTMS session or if the participant is complaining of headache or scalp/facial pain, MT must be determined again.

MT is defined as the "minimum stimulus intensity that elicits a response in either the abductor pollicis brevis (APB) or the first dorsal interosseous (FDI) on the contralateral side for ≥ 50% of applied stimuli (usually defined as ≥ 5 of 10 stimuli administered)"[10] following single pulse TMS, that is graded from small to high and delivered every 5 seconds. The muscle response may be either determined by the amplitude of EMG response or by visual observation of finger twitching. Although finger twitching is a more feasible alternative in busy clinical settings, it may be noted that this method yields "significantly higher MTs than EMG of that muscle."[17]

Target location

Apart from the conventional scalp i.e. the "5-cm" and "International 10-20 electroencephalography (EEG)" system based methods, neuroimaging i.e., magnetic resonance imaging (MRI, both structural & functional, resting & task based as well as 3D), Single-photon emission computed tomography (SPECT) and positron emission tomography (PET), based methods too have been developed for precise location of target for stimulation.[18] TMS equipment with in-built neuronavigation systems, that utilize the neuroimages have been approved by the FDA.[2] It is suggested that although neuroimaging based methods are more accurate, use of the International 10-20 EEG system for target location is considered a cost-effective alternative.[18]

Safety issues and monitoring

TMS and hearing

Following steps shall be addressed for hearing safety during TMS:[12]

1. Individuals with pre-existing noise-induced hearing loss or receiving simultaneous treatment with ototoxic medications (aminoglycosides) shall undergo risk/benefit considerations.
2. Use of well-fitted hearing protection such as earplugs by patients and TMS operators
3. ENT referral for any complaints of hearing loss, tinnitus or ear fullness.
4. Patients with Cochlear implants should not undergo TMS.

Safety of TMS in combination with other devices

TMS can be safely employed with devices such as implanted stimulators in the central or peripheral nervous system, cardiac pacemakers, VNS systems given that coil is not closer

than 10 cm to the electronic components like Implanted pulse generator (IPG) in the neck. A important point to consider is that TMS should start with low intensity and progressively increase to the desired intensity. If overall risk benefit analysis confers risk, then turning the IPG off during TMS may offer some protection against induced electrode currents. TMS in patients with DBS shall only be carried out if there are concrete scientific or medical reasons and shall be overseen by the institute ethics committee.[12]

Safety of TMS in combination with drugs

Despite large numbers of patients receiving drugs and TMS in the past decade, no detailed toxicities have arisen from the combination. Moreso, the observed seizure rate is very low despite most of them were receiving CNS activating medications. Situation is very reassuring with the use of traditional stimulation parameters and focal coils. So, currently no caution shall be entertained. However, documentation of simultaneous intake of drugs (like clozapine) and additional possible seizure threshold lowering factors (such as alcohol intake, sleep deprivation, infection) during the TMS sessions shall be done. All efforts to systematically capture of reporting of side effects shall be carried out.[12]

TMS safety in special population

Paediatric: Majority of TMS studies continue to be single and paired pulse studies. Most common side effect reported was headache. No other serious side effects have been reported. With suitable hearing safety measures, single-pulse and paired-pulse TMS use is safe in children with age two years and older. [12]

Pregnancy: Approximately 100 mV/m of TMS-induced E-field is generated by a figure-of eight coil (adjacent to the DLPFC), when the coil-uterus distance was 60 cm. This is far less than the safety threshold to stimulate myelinated central and peripheral nerves (800 mV/m).. So, it is viable to conclude that rTMS (figure-of eight coil) has minimal risk for the mother and child. [12]

TMS safety for the operators

Safety issues are seldom addressed for TMS operators, despite being exposed for several hours daily for several years. It is pertinent that TMS operator should avoid (or minimise) proximity i.e. less than 40 cm distance from the magnetic coil in order to derail exposures. Also, the use of ear plugs or earmuffs is mandatory for operators. [12]

TMS safety and protocols intensity

Safety parameters of stimulation defined by Rossi et al.[12] needs to be adhered to for conventional protocols. But for parameters exceeding these safety guidelines, use of neurophysiological monitoring (i.e., appearance of motor twitches during stimulation as a warning for increased cortical stimulation) needs to be carried out. If any de novo seizure arises, kindly reconsider the protocol of the trial. Also, scientific community needs to be alerted about the unsafety of any new combination of parameters. [12]

Evidence

It is important to note at the beginning that in all the meta-analyses reviewed for recommendations on efficacy in this document, for all conditions except headache and a

small minority of studies for other conditions, rTMS has been used as an adjunct to the treatment as usual.

Evidence- Depression *(please see Table 4)*

We reviewed 23 meta-analyses for depression.

Efficacy of rTMS in major depression

There is strong evidence for a significant positive effect for the use of rTMS for treating acute depression, especially for unipolar depression. The pooled effect sizes for improvement in depression severity range between 0.302 to 0.83. The odds for response (pooled odds ratios (ORs) ranging between 3.26 and 3.64) and remission rates (pooled ORs ranging between 2.45 and 4.63) was significantly higher for the use of rTMS. The strongest evidence was for high-frequency rTMS over the left DLPFC (pooled ORs for response ranging from 3.17 to 3.75).

Two network meta-analyses *(supplementary table 1; sl.no. 6 and 10)* compared odds of response for various rTMS forms. Based on the ORs and narrow confidence intervals, high-frequency rTMS over the left DLPFC has been shown to be superior followed by low frequency rTMS over right DLPFC. Bilateral rTMS (high frequency over left DLPFC + low frequency over right DLPFC), iTBS over left DLPFC, bilateral TBS (iTBS over left DLPFC + cTBS over right DLPFC), deep TMS and iTBS and priming rTMS have also been found to have significant positive effect. A meta-analysis focussing on TBS *(supplementary table 1; sl.no. 3)* though claims that the effects of iTBS are similar to high-frequency rTMS.

There is moderate positive evidence for the use of rTMS in acute bipolar depression (effect size 0.302, OR for response 2.72), one meta-analysis that compared unipolar and bipolar depression *(supplementary table 1; sl.no. 9)* found that the significance was restricted to only unipolar depression and not for bipolar depression . For bipolar depression too, the strongest evidence was for high-frequency rTMS over the left DLPFC (pooled ORs for response 2.17). In fact, in bipolar depression only high-frequency rTMS over the left DLPFC has been shown to be cause significant effects. Bilateral rTMS and low frequency rTMS over right DLPFC have not been shown to have significant effects.

When only treatment resistant depression (TRD) cases were considered, rTMS was found to have a significant positive effect. Based on the ORs and narrow confidence intervals, high-frequency rTMS over the left DLPFC followed by low frequency rTMS over right DLPFC has been shown to be superior. Bilateral TBS and priming rTMS too, showed significant positive effect. One meta-analysis *(supplementary table 1; sl.no. 11)* though showed that both unilateral and bilateral stimulation paradigms did not differ significantly in terms of both response and remission rates. There is clear evidence that in TRD, response to rTMS was better when it is added as an augment to antidepressants rather than stand-alone.

Accelerated rTMS (including accelerated TBS) paradigm targeted over left DLPFC was not found be associated with significant response, in a meta-analysis focussing on accelerated protocols *(supplementary table 1; sl.no. 8)*. Although the more recent, Stanford Accelerated Intelligent Neuromodulation Therapy (SAINT) protocol,[19] a high dose- accelerated (10 daily sessions for 5 days), resting-state functional connectivity functional MRI-guided iTBS, has shown to have 86.4% remission rates in patients with treatment-resistant depression, such protocols remain to be tested in controlled studies.

One meta-analysis focussing on unilateral and bilateral stimulation paradigms (both conventional and TBS) *(supplementary table 1; sl.no. 11)* find that only frequency of stimulation could predict the treatment outcome, while intensity of stimulation, train duration and number of treatment sessions did not. However, a meta-analysis involving only TBS studies find that ≥1800 pulses/session, subthreshold intensity and ≤2-week treatment duration predict higher response rates *(supplementary table 1; sl.no. 3)*. One meta-analyses focussing on MDD patients aged >50 years found higher age and number of sessions predicted greater response *(supplementary table 1; sl.no. 1)*.

<Insert Table 4 here>

<Insert Figure 1 here>

Which device/coil is better?

The efficacy and acceptability of 3 stimulation devices (NeuroStar, MagPro, and Magstim) for depressive disorders was not significantly different. The response rates, all-cause discontinuation, or remission rates among the devices (p = 0.12, p = 0.84, and p = 0.07, respectively) were comparable *(supplementary table 1; sl.no. 24)*. The comparison between H1 and F8 coils showed a larger reduction in depression severity in H1-coil vs. F8-coil studies and a trend towards higher remission rates in F8-coil vs. H1-coils . However, authors deem these differences are not clinically-relevant as they were based on a low volume of studies and were not placebo-controlled *(supplementary table 1; sl.no. 25)*.

How does rTMS fare compared to other non-invasive brain stimulation strategies?

In the comparisons between two active treatments, bitemporal ECT was associated with higher response than high frequency left rTMS, continuous theta burst stimulation, and deep transcranial magnetic stimulation. High dose right unilateral ECT was associated with higher response than continuous theta burst stimulation *(supplementary table 1; sl.no. 6)*. In TRD, BL-rTMS was found to be more effective than deep brain stimulation. BL-rTMS was more acceptable than bitemporal ECT. Priming TMS was more acceptable than BT-ECT *(supplementary table 1; sl.no. 10)*.

How sustained is the antidepressant response to rTMS?

Among initial responders, 66.5 (57.1-74.8)% sustained response at 3rd month, 52.9 (40.3-65)% at 6th month, and 46.3 (32.6-60.7)% at 12th month. Further higher proportion of women, as well as receipt of maintenance treatment, predicted higher responder rates at specific time-points. This meta-analysis, which included 19 studies, showed absence of major bias *(supplementary table 1; sl.no. 26)*.

Maintenance rTMS for MDD

The evidence base for maintenance rTMS for relapse prevention in MDD is still accumulating and not enough for making specific recommendations. However, it has shown a promise for effectively reducing or preventing the relapses in treatment-resistant MDD patients when scheduled along with rTMS treatment during acute phases.[20]

How much is the placebo effect for rTMS treatment in depression?

A meta-analysis of randomized controlled trials (RCTs) involving participants with MDD on this issue showed a large placebo response (g=0.8 (0.65-0.95). This was regardless of the modality of intervention and was directly associated with depression improvement of the active group, and inversely associated with higher levels of treatment-resistant depression. Most of these studies had low to unclear risk of bias *(supplementary table 1; sl.no. 27)*. Recently, 34 neuroimaging studies of placebo effects were meta-analysed and showed that the placebo effects are associated with activation in left dorsolateral prefrontal cortex and left sub-genual anterior cingulate cortex (sgACC)/ventral striatum *(supplementary table 1; sl.no. 28)*.

Safety of TMS for MDD

A meta-analysis including 53 sham controlled trials found no increased risk of either serious adverse events or drop-outs due to an adverse event (see table 5). However, there is a significantly greater risk of non-serious adverse events (mild and transient) following rTMS treatment for depression *(supplementary table 1; sl.no. 29)*.

<Insert Table 5 here>

Specifically, Hypomanic/manic switch with rTMS treatment was assessed in a recent meta-analysis of 25 clinical trials where majority of the studies targeted the left dorsolateral prefrontal cortex. Hypomanic switch was described in 4 studies. Overall, the results suggest that rTMS protocols for treatment of depression are not related to affective switch *(supplementary table 1; sl.no. 30)*.

Combined rTMS and psychosocial interventions

Seventeen studies that combined NIBS and psychosocial interventions were meta-analysed *(supplementary table 1; sl.no. 31)*. Three out of four of these studies using rTMS (2-HF-L and 1-LF-R) as NIBS modality were analysed. rTMS combined with psychosocial intervention had no significant effect in alleviating depressive symptoms when compared with sham rTMS plus psychosocial intervention (SMD 0.31 (0.76-1.38)). These three studies though included patients where depression was a secondary outcome variable (these included cases of TBI, post-stroke and fibromyalgia).

rTMS for suicidality

A meta-analysis of 10 RCTs showed that rTMS significantly reduced suicidal ideation (Hedges' g 0.390 (0.193 to 0.588) and severity of depressive symptoms (Hedges' g 0.698 (0.372-1.023) in patients with major mental disorders. A subgroup analysis in this meta-analysis found that rTMS reduced suicidal ideation among patients with non-treatment-resistant depression (non-TRD) but not in those with TRD. rTMS as combination therapy and more than 10 sessions had larger effect *(supplementary table 1; sl.no. 32)*. Another meta-analysis included only TRD (unipolar as well as bipolar) patients from 16 studies. It found that the reductions in suicidal ideation was not significant (g 0.158 (0.078-0.393) in RCTs. However, uncontrolled trials showed a significant decrease in suicidal ideation scores (g 0.692 (0.463-0.922) *(supplementary table 1; sl.no. 33)*. Godi et al. (2021),[21] in a systematic review showed that high frequency rTMS at left dorsolateral prefrontal cortex as an adjunct

to antidepressant medication has the highest evidence for reducing suicidal behaviour in treatment resistant depression.

Suicidality has been assessed as a secondary outcome variable in most of the trials considered for the meta-analyses and excluded acutely suicidal patients. Acutely suicidal patients have been considered in some studies using accelerated rTMS, but with lack of positive evidence. Essentially therefore, with the evidence so far, we do not recommend rTMS for acutely suicidal patients.

Efficacy of rTMS in peri-partum depression

Evidence (see table 4) suggests that rTMS has significant positive effect on peri-partum depression. The pooled effect sizes range between 0.65 and 1.39. However, one meta-analysis has been found that the OR for remission rates (i.e. 1.83) but not for response rates is significant for the use of rTMS in peri-partum depression. Pooled effect sizes for the use of high-frequency rTMS over the left DLPFC were greater than those for low frequency rTMS over right DLPFC. The treatment was deemed safe for both mothers and foetuses/infants.

Efficacy of rTMS in post-stroke depression

There is strong evidence for a significant positive effect for the use of rTMS for treating post-stroke depression, both for immediate as well as long term effects (see table 4). The pooled effect sizes for improvement in depression severity range between 1.01 to 4.92. The odds for response (pooled odds ratios (ORs) ranging between 3.31 and 5.26) and remission rates (pooled ORs ranging between 2.72 and 4.72) was significantly higher for the use of rTMS. The most evidence was for high-frequency rTMS over the left DLPFC. There is some evidence that rTMS for post-stroke depression may be more effective in Asian than the North American population; those receiving high-frequency rTMS to be more prone for headaches; and that high-frequency rTMS combined with antidepressants may be more effective. rTMS though had no significant effect on cognitive function recovery in post-stroke depression patients.

Efficacy of rTMS in post-traumatic brain injury depression

One meta-analysis (see table 4; *supplementary table 1; sl.no. 20*) assessed the efficacy of rTMS in post-traumatic brain injury (TBI) depression and found that it has a significant positive effect (pooled effect size 1.03). The effect was significant for high-frequency rTMS over the left DLPFC (pooled effect size 0.98). However, these effects were short lasting and they dissipated at 1-month follow-up.

Efficacy of rTMS in depression associated with Parkinson's disease

There is strong evidence for a moderate effect for the use of rTMS for treating depression associated with Parkinson's disease (see table 4). The pooled effect sizes for improvement in depression severity range between 0.62 to 0.86. The effect was significant only for high-frequency rTMS (pooled effect size 1.03) and over the left DLPFC (pooled effect size 1.64). The antidepressant effects of rTMS were found to be greater than fluoxetine (pooled effect size 0.74) and found to be statistically compared to when SSRIs were used alone. Age, disease duration, numbers of pulses, and session durations were shown to influence the efficacy of rTMS on depression associated with Parkinson's disease.

<Insert Figure 2>

Evidence- Bipolar Mania

A meta-analysis *(supplementary table 1; sl.no. 5)* included 3 RCTs of patients with bipolar mania receiving HF-R rTMS, of which only one study reported improvement with rTMS compared to sham. The sham controlled improvements were not significant (SMD 0.298 (−0.77- 1.37)). Two of the three RCTs included adults and one included adolescent patients. All three studies used high frequency rTMS targeting the right DLPFC.

Evidence- Anxiety Disorders

We reviewed four meta-analyses. One of them *(supplementary table 1; sl.no. 35)* analysed other forms of NIBS combined with rTMS and did not provide separate pooled statistics for rTMS, therefore was not considered for synthesis. Evidence (see table 6) suggests that rTMS has significant positive effect in the treatment of generalized anxiety disorder. The pooled effect sizes range between 1.45 and 1.87. Moreover, depression associated with generalized anxiety disorder also shows significant improvement (SMD 1.65). However, rTMS was not found to be effective in the treatment of panic disorder. Evidence in this regards has been shown to be homogenous.

Among the rTMS forms both conventional rTMS and TBS have been used. Most commonly used stimulation paradigm is low frequency rTMS targeted to right DLPFC. High frequency rTMS has also been used to target right DLPFC. A few studies have targeted left DLPFC using iTBS.

<Insert Table 6 here>

Evidence- Obsessive Compulsive Disorder (OCD) and Tourette syndrome

There is moderately positive evidence for use of rTMS (10 to 30 sessions; 1 to 12 weeks) for treating OCD (Pooled SMDs for YBOCS scores range from .501 to 0.79) (see table 7). Both high and low frequency protocols have been equally effective than sham stimulation. There are 3 preferred target sites for stimulation i.e., low frequency right DLPFC (most effective), high frequency bilateral DLPFC and low frequency supplementary motor area (SMA). High frequency bilateral DLPFC (SMD: 1.52) and low frequency right DLPFC (SMD: .83) stimulations have reported most global improvements. Effects of stimulation are evident earliest by 2 weeks of stimulation and would have short lasting effects (till 4 weeks). Maximum robust effects were found with 800 to 1200 pulses per session. TBS was found to be ineffective, though data is insufficient. There is inconclusive as well as insufficient evidence with respect to the effect of deep TMS in OCD *(supplementary table 1; sl.no. 39)*. Common adverse effects reported were headache, concentration difficulties, scalp pain, sedation, weakness, fatigue, fainting, facial nerve stimulation. There were no major side effects reported and no difference between dropout rates for active vs sham rTMS.

<Insert Table 7 here>

We reviewed one meta-analysis, which included 8 RCTs and open label trials *(supplementary table 1; sl.no. 43)*, and found rTMS improves tics severity (SMD: .61) but not when controlled for placebo response in Tourette's disorder. Younger age and bilateral supplementary motor area stimulation predicted a better treatment effect.

Evidence- Post-traumatic stress disorder (PTSD)

We reviewed three meta-analysis. Evidence (see table 8) suggests that rTMS has significant positive effect in the treatment of post-traumatic stress disorder. The pooled effect sizes range between 0.68 and 1.16. Both high frequency rTMS and low frequency rTMS targeted at right DLPFC show significant improvements, without significant differences between them.

<Insert Table 8 here>

<Insert Figure 3 here>

Evidence- Schizophrenia

Efficacy of rTMS in auditory hallucinations

There is moderate positive evidence for use of rTMS (4 to 40 sessions delivered till 8 weeks) for treating resistant auditory hallucinations (AH) (Pooled SMDs range from .24 to 0.51) (see table 9). Low frequency (LF) rTMS stimulation at left temporo-parietal cortices (T3P3) is the preferable site.

Efficacy of rTMS in negative symptoms (NS)

There is moderate to large positive evidence for use of rTMS for treating NS in schizophrenia (SMD: .49 to .64) (table 9). High frequency (HF) stimulation to left DLPFC and more than 10 sessions were found to be superior to sham. Stimulation protocols containing more than 7500 stimuli per week at an intensity of > 100% motor threshold, may be more effective than other protocol.

Efficacy of rTMS in cognitive dysfunction

rTMS has shown to have minimal efficacy of active over sham in improving attention, processing speed, executive functioning and working memory.

Efficacy of rTMS in clozapine refractory schizophrenia

We reviewed one meta-analysis *(supplementary table 1; sl.no. 49)* that included 3 RTCs employing rTMS as an augmentation strategy in clozapine refractory schizophrenia. It was found that effects of rTMS were not significant for either positive symptoms, NS or cognition in schizophrenia.

<Insert Table 9 here>

<Insert Figure 4 here>

Evidence- Substance use disorders

We reviewed six meta-analysis. Two of them *(supplementary table 1; sl.no. 53 and 54)* assessed other NIBS together with rTMS and did not provide pooled statistics either for rTMS or for substance use disorders, separately, therefore were not considered for synthesis. Evidence (see table 10) suggests that high frequency rTMS targeted at left DLPFC,

respectively) and high frequency deep TMS targeted over bilateral DLPFC has significant positive effect on reducing cigarette smoking frequency (pooled effect size 1.22 (0.66-1.77), 0.77 (0.34-1.20), reducing craving in general in substance use disorders (pooled effect size 0.62 (0.35-0.89)), also in nicotine (pooled effect size 0.47 (0.12-0.82) and illicit drug dependence (pooled effect size 0.81 (0.37-1.24). High frequency rTMS targeted at left DLPFC and deep TMS targeted to B/L DLPFC and insula also have been found to reduced substance consumption for nicotine/cocaine (pooled effect size 0.77 (0.03-1.53)) and nicotine/alcohol (pooled effect size 1.16 (0.68-1.64)). Apart from the positive evidence for high frequency rTMS targeted at left DLPFC to reduce symptoms of tobacco use disorder, both craving and consumption amounts, none of the other evidence is consistent.

<Insert Table 10 here>

<Insert Figure 5 here>

Evidence- Eating disorders

We reviewed three meta-analyses for eating disorders. All three of them *(supplementary table 1; sl.no. 53, 54 and 58)* did not provide effect sizes separately for eating disorders and for rTMS (they included persons with drug addiction and overeating together, and rTMS and other NIBS together). One study also included sub-clinical and clinical eating disorders together *(supplementary table 1; sl.no. 58)*. No recommendation could therefore be drawn.

Evidence- Neurodevelopmental disorders- Autism spectrum disorder and Attention deficit hyperactivity disorder

We found one meta-analysis *(supplementary table 1; sl.no. 59)* for attention deficit hyperactivity disorder (ADHD) and two meta-analyses *(supplementary table 1; sl.no. 60 and 61)* for autism spectrum disorders (ASD). The meta-analysis for ADHD that included all NIBS studies on both adults and children with ADHD, did not include any rTMS study for the quantitative synthesis. Therefore, no conclusions are drawn from it.

Of the two meta-analyses in ASD (see table 11), one quantitatively synthesized studies on the effects on various symptom domains and the other one exclusively focussed on adverse events associated with rTMS in ASD. Moderate improvements were reported in the domains of repetitive and restricted behaviour (pooled effect size 0.50) and social behavior deficits (pooled effect size 0.47). One of the included study did report that the effects on social behavior deficits persisted till one month after the rTMS sessions. There is a large variability in the stimulation parameters, especially the intensity and the target location in the included studies. This makes suggesting specific recommendation for the use of rTMS in ASD difficult. The reported adverse effects were all mild and transient. Commonest of them irritability, facial discomfort and headaches.

<Insert Table 11 here>

Evidence- Dementia and mild cognitive impairment (MCI)

We reviewed 12 meta-analysis on the effects of rTMS in patients with dementia (all articles were focussed on Alzheimer dementia) or MCI. One of them, which did not assess global cognition, was not included for synthesis; this study assessed only individual cognitive functions- attention and executive function; both of which were found not to improve with

rTMS *(supplementary table 1; sl.no. 73)*. The synthesis of the other 11 studies is showed in table 12. Evidence suggests that rTMS has significant positive effect in the management of dementia- for both cognitive functions (pooled effect sizes ranged between 0.42 and 1.14) neuropsychiatric/behavioral and psychological symptoms (pooled effect sizes ranged between 0.47 and 0.82). While all studies favour high frequency rTMS targeted at left or bilateral DLPFC, for both cognitive functions and neuropsychiatric symptoms, low frequency rTMS targeted at right DLPFC has also been suggested in some analyses. Subgroup analyses showed improvements in sub-domains of cognition, specifically memory, language and executive functions with high frequency rTMS. Treatment with high frequency rTMS shows improvement in in global cognition in both short-term and also long-term. Studies including both Alzheimer Dementia (AD) and MCI found that the positive effects were restricted to only AD. Younger age, multiple sites, more sessions (>5-10), concurrent cognitive training or cognitive enhancers and mild-moderate severity of cognitive impairment have been found as possible factors involved in greater response.

<Insert Table 12 here>

<Insert Figure 6 here>

Evidence- Cognitive function in other psychiatric disorders

We reviewed two meta-analyses (table 13) that assessed the effect of rTMS on cognitive functioning in various psychiatric disorders- depression, schizophrenia and substance use disorders. rTMS has been found to have a significant effect on working memory improvement only in substance use disorders. One meta-analysis, which specifically examined the effects of rTMS on executive function with advancing age, found that the effects of rTMS on executive functions is not greater as age advances, but found that the benefits in executive functions are positively related to improvement in depression *(supplementary table 1; sl.no. 74)*. Two meta-analyses (that investigated the effects of rTMS for cognitive enhancement in healthy participants were not included the synthesis *(supplementary table 1; sl.no. 75 and 76)*.

<Insert Table 13 here>

Evidence- Insomnia

We reviewed three meta-analysis. Evidence from sham controlled studies (see table 14) suggests that rTMS has significant positive effect in the treatment of insomnia, rated on the standard instrument- the Pittsburgh Sleep Quality Index (PSQI). The pooled effect sizes range between 1.44 and 3.94. The pooled effect sizes for all seven subscales of PSQI– sleep quality (1.28), sleep latency (1.34), sleep time (0.70), sleep efficiency (0.67), sleep disturbance (1.35), hypnotic usage (1.57) and daytime dysfunction (1.13) suggested significant improvements. Similarly, except for non-REM 2, pooled effect sizes for all 8 polysomnography (PSG) parameters – sleep efficiency (0.57), sleep onset latency (0.95), total sleep time (0.49), wakefulness after sleep onset (0.65), non-REM 1 (0.68), non-REM 3 (0.49) and REM sleep (0.77) suggested significant improvements. It has noted that improvement in sleep parameters increases significantly with treatment duration (from 10 days to 30 days) too. It has also been shown that the significant improvements in insomnia with rTMS persists even at 1-4 weeks follow-up (pooled effect size 3.41). Majority of these studies have used

low frequency rTMS targeted at right DLPFC. Therefore, low frequency rTMS targeted at right DLPFC is suggested for treatment of insomnia.

<Insert Table 14 here>

Evidence- Migraine

Three meta-analyses were reviewed. One of them did not report effect sizes for rTMS, separately and therefore not used for synthesis *(supplementary table 1; sl.no. 80)*. The other two studies (see table 15) provided evidence for a significant reduction in the number of 'migraine days' especially with high frequency rTMS targeted at the primary motor cortex. There was inconsistent evidence for the use of high frequency rTMS targeted at left prefrontal cortex in the treatment of migraine. There was evidence that the response for Chronic migraine and episodic migraine were similar.

<Insert Table 15 here>

Evidence- Fibromyalgia and chronic pain

Three meta-analysis for fibromyalgia and two for other chronic pain syndromes were reviewed (table 16). It was found that high frequency rTMS targeted at the primary motor cortex was significantly effective for reducing pain intensity (pooled effect sizes ranged between 0.35 to 0.49), both immediate and also till 4 weeks post intervention. Fibromyalgia related impact on quality of life also showed improvement with rTMS, especially between 5-12 weeks. High frequency rTMS targeted at left prefrontal cortex was not found to be effective. For other chronic pain syndromes, we reviewed two meta-analyses (table 16). While, one reported that high frequency rTMS targeted at the primary motor cortex and iTBS at cerebellum significantly improved pain intensity (SMD 0.76) in patients with chronic regional pain syndrome (arm), cervical dystonia, the other one found that the effectiveness was not significant in other chronic pain syndromes.

<Insert Table 16 here>

Evidence- Chronic Tinnitus

We reviewed 5 meta-analyses for the use of rTMS in chronic tinnitus (table 17). Short term i.e. at 2 and 6 months, and not immediately, the tinnitus severity was shown to reduce significantly with rTMS (pooled effect sizes ranged between 0.42 and 0.79. Tinnitus related disability (tinnitus handicap) also showed improvements (pooled mean differences ranged between 8.81 to 8.52). The most common modality used was low frequency rTMS targeted at the primary auditory cortex, which was found to be better than other sites too. Moreover, it was found that stimulation of bilateral auditory cortices, compared to left alone, and priming paradigms would lead to greater effects. The rTMS sessions were found to be well tolerated in this population.

<Insert Table 17 here>

<Insert Figure 7 here>

Evidence- Essential tremors

One meta-analysis *(supplementary table 1; sl.no. 91)*. that included 8 studies, of which 7 were rTMS, showed significant positive effect of rTMS on essential tremors (SMD 0.61 (0.42-0.79)). The rTMS form was either low frequency rTMS or cTBS targeted at cerebellum (right or BL posterior cerebellum) or pre-supplementary motor area or left motor area.

Evidence- Others

One meta-analysis showed that there is lack of positive evidence for the effects of rTMS on impulsivity *(supplementary table 1; sl.no. 94)*. A meta-analysis *(supplementary table 1; sl.no. 95)* synthesizing evidence for brain stimulation interventions in borderline personality disorder found no randomized controlled trials assessing the effects of rTMS. Albeit in healthy participants, rTMS was found to have small but significant effects on various aspects of empathy *(supplementary table 1; sl.no. 96)*.

We found no meta-analyses for dissociative (and conversion; psychogenic non-epileptic seizures) disorders. Recently, studies are using many newer forms of rTMS i.e., deep TMS (dTMS), prolonged iTBS (piTBS), synchronized TBS (sTBS), along with priming TBS (pTBS) and accelerated TMS (aTMS),[22] and are targeting many alternate brain areas such as cerebellum for schizophrenia,[23] orbitofrontal cortex for OCD,[24] etc. The meta-analyses we included do not systematically review many these studies.

Indian evidence

A very recent meta-analysis[25] conducted on 52 Indian studies investigating the safety and efficacy of rTMS in various neuropsychiatric disorders suggested a significant positive effect for all outcomes, with moderate to large effect sizes, at both end of treatment as well as at follow-up compared to pre-intervention scores for groups that received active rTMS. However, rTMS was not found to be effective for any outcome in the series of "active vs sham controlled" meta-analyses, except for migraine (headache severity and frequency) and craving in alcohol dependence. Many studies had significant risk of bias and the two conditions that showed positive sham-controlled evidence lost significance in sensitive analysis. Also significant heterogeneity was seen. Indian evidence however suggests that serious adverse events with rTMS were rare. Frequency of occurrence of both seizures and affective switch was <0.5%. Headache and scalp pain were the common non-serious adverse events reported with use of rTMS.

Evidence- Summary

There are many other psychiatric disorders where rTMS has been used, but there is insufficient evidence. The figure below shows disorders where there is sufficient and positive disorders, and those having either insufficient evidence for the rTMS or the evidence is not significant or significantly lower, compared to sham stimulation. It is important to note that rTMS is to be used as an adjunct to the other conventional treatments.

<Insert Figure 8 here>

Table 18 shows the list of all indications and evidence for rTMS in treatment of various psychiatric disorders.

<Insert Table 18 here>

Limitations

The strategy we chose i.e., umbrella review of meta-analyses, in formulating the clinical recommendations are constrained by certain limitations. While the extant of available information is limited, selective reporting of outcomes often overlooks negative evidence and tends to provide a positive biased evidence.[26] Further, regional variations may be missed in such an approach. Moreover, the umbrella review we conducted was a qualitative one and we did not conduct quantitative analyses and therefore poses an important limitation.

Conclusion

This CPG for the use of rTMS in psychiatry highlights its usefulness across various psychiatric disorders and conditions. We provide an overview of the latest and emerging evidence in this regard for safe and effective application of rTMS. We also mention the basic aspects of rTMS set-up, delivering and monitoring of rTMS sessions. The evidence for the use of rTMS still emerging and is not thorough. So far, recommendations for its use is in only in certain clinical situations. More research is required for preparing comprehensive algorithms for the implementation the use of rTMS across different disorders, especially in various phases of illnesses, various sub-samples, etc, and also in terms of specific rTMS protocols in terms of number pulses, trains, sessions, for each of the disorders. Perhaps, there is no sufficient evidence with respect to stimulation with what number of sessions to be considered for a patient to be termed non-responder for a particular outcome. There is meagre evidence in terms of rTMS effects in comorbid conditions such as depression with OCD, schizophrenia with OCD, etc. Evidence with respect to alternate target sites for depression, OCD, schizophrenia and other conditions although has began accumulating, but is not sufficient for a quantitative synthesis.

REFERENCES

1. Howes OD, Thase ME, Pillinger T. Treatment resistance in psychiatry: state of the art and new directions. Mol Psychiatry. 2022 Jan;27(1):58-72. doi: 10.1038/s41380-021-01200-3.
2. Cohen SL, Bikson M, Badran BW, George MS. A visual and narrative timeline of US FDA milestones for Transcranial Magnetic Stimulation (TMS) devices. Brain Stimul. 2022 Jan-Feb;15(1):73-75. doi: 10.1016/j.brs.2021.11.010.
3. Deng ZD, Lisanby SH, Peterchev AV. Electric field depth-focality tradeoff in transcranial magnetic stimulation: simulation comparison of 50 coil designs. Brain Stimul. 2013 Jan;6(1):1-13. doi: 10.1016/j.brs.2012.02.005.
4. Zheng, K.Y., Dai, G.Y., Lan, Y., Wang, X.Q., 2020. Trends of Repetitive Transcranial Magnetic Stimulation From 2009 to 2018: A Bibliometric Analysis. Front. Neurosci. 26(14):106. doi: 10.3389/fnins.2020.00106.
5. Godi SM, Tikka SK. Indian research on transcranial magnetic stimulation: A bibliometric analysis. Submitted for Publication; 2022.

6. Malhi GS, Bell E, Bassett D, Boyce P, Bryant R, Hazell P, Hopwood M, Lyndon B, Mulder R, Porter R, Singh AB, Murray G. The 2020 Royal Australian and New Zealand College of Psychiatrists clinical practice guidelines for mood disorders. Aust N Z J Psychiatry. 2021 Jan;55(1):7-117. doi: 10.1177/0004867420979353.

7. Lefaucheur JP, André-Obadia N, Antal A, Ayache SS, Baeken C, Benninger DH, Cantello RM, Cincotta M, de Carvalho M, De Ridder D, Devanne H, Di Lazzaro V, Filipović SR, Hummel FC, Jääskeläinen SK, Kimiskidis VK, Koch G, Langguth B, Nyffeler T, Oliviero A, Padberg F, Poulet E, Rossi S, Rossini PM, Rothwell JC, Schönfeldt-Lecuona C, Siebner HR, Slotema CW, Stagg CJ, Valls-Sole J, Ziemann U, Paulus W, Garcia-Larrea L. Evidence-based guidelines on the therapeutic use of repetitive transcranial magnetic stimulation (rTMS). Clin Neurophysiol. 2014 Nov;125(11):2150-2206. doi: 10.1016/j.clinph.2014.05.021.

8. Lefaucheur JP, Aleman A, Baeken C, Benninger DH, Brunelin J, Di Lazzaro V, Filipović SR, Grefkes C, Hasan A, Hummel FC, Jääskeläinen SK, Langguth B, Leocani L, Londero A, Nardone R, Nguyen JP, Nyffeler T, Oliveira-Maia AJ, Oliviero A, Padberg F, Palm U, Paulus W, Poulet E, Quartarone A, Rachid F, Rektorová I, Rossi S, Sahlsten H, Schecklmann M, Szekely D, Ziemann U. Evidence-based guidelines on the therapeutic use of repetitive transcranial magnetic stimulation (rTMS): An update (2014-2018). Clin Neurophysiol. 2020 Feb;131(2):474-528. doi: 10.1016/j.clinph.2019.11.002.

9. Rosson S, de Filippis R, Croatto G, Collantoni E, Pallottino S, Guinart D, Brunoni AR, Dell'Osso B, Pigato G, Hyde J, Brandt V, Cortese S, Fiedorowicz JG, Petrides G, Correll CU, Solmi M. Brain stimulation and other biological non-pharmacological interventions in mental disorders: An umbrella review. Neurosci Biobehav Rev. 2022 Aug;139:104743. doi: 10.1016/j.neubiorev.2022.104743.

10. McClintock SM, Reti IM, Carpenter LL, McDonald WM, Dubin M, Taylor SF, Cook IA, O'Reardon J, Husain MM, Wall C, Krystal AD, Sampson SM, Morales O, Nelson BG, Latoussakis V, George MS, Lisanby SH; National Network of Depression Centers rTMS Task Group; American Psychiatric Association Council on Research Task Force on Novel Biomarkers and Treatments. Consensus Recommendations for the Clinical Application of Repetitive Transcranial Magnetic Stimulation (rTMS) in the Treatment of Depression. J Clin Psychiatry. 2018 Jan/Feb;79(1):16cs10905. doi: 10.4088/JCP.16cs10905.

11. Hebel T, Grözinger M, Landgrebe M, Padberg F, Schecklmann M, Schlaepfer T, Schönfeldt-Lecuona C, Ullrich H, Zwanzger P, Langguth B; DGHP Consensus Group:, Bajbouj M, Bewernick B, Brinkmann K, Cordes J, Di Pauli J, Eichhammer P, Freundlieb N, Hajak G, Höppner-Buchmann J, Hurlemann R, Kamp D, Kayser S, Kis B, Kreuzer PM, Kuhn J, Lammers M, Lugmayer B, Mielacher C, Nickl-Jockschat T, Nunhofer C, Palm U, Poeppl TB, Polak T, Sakreida K, Sartorius A, Silberbauer C, Zilles-Wegner D. Evidence and expert consensus based German guidelines for the use of repetitive transcranial magnetic stimulation in depression. World J Biol Psychiatry. 2021 Dec 16:1-22. doi: 10.1080/15622975.2021.1995810.

12. Rossi S, Antal A, Bestmann S, Bikson M, Brewer C, Brockmöller J, Carpenter LL, Cincotta M, Chen R, Daskalakis JD, Di Lazzaro V, Fox MD, George MS, Gilbert D, Kimiskidis VK, Koch G, Ilmoniemi RJ, Lefaucheur JP, Leocani L, Lisanby SH, Miniussi C, Padberg F, Pascual-Leone A, Paulus W, Peterchev AV, Quartarone A, Rotenberg A, Rothwell J, Rossini PM, Santarnecchi E, Shafi MM, Siebner HR, Ugawa Y, Wassermann EM, Zangen A, Ziemann U, Hallett M; basis of this article began with a Consensus Statement from the IFCN Workshop on "Present, Future of TMS: Safety, Ethical Guidelines", Siena, October 17-20, 2018, updating through April 2020. Safety and recommendations for TMS use in healthy subjects and patient populations, with updates on training, ethical and regulatory issues: Expert Guidelines. Clin Neurophysiol. 2021 Jan;132(1):269-306. doi: 10.1016/j.clinph.2020.10.003.

13. Feifel D, Dunner DL, Press DZ; Board of Directors and Clinical Standards Committee of the Clinical TMS Society. Roles and Qualifications of TMS Treatment Team Members. J Clin Psychiatry. 2018 Jan/Feb;79(1):17lr11887. doi: 10.4088/JCP.17lr11887.

14. Fried PJ, Santarnecchi E, Antal A, Bartres-Faz D, Bestmann S, Carpenter LL, Celnik P, Edwards D, Farzan F, Fecteau S, George MS, He B, Kim YH, Leocani L, Lisanby SH, Loo C, Luber B, Nitsche MA, Paulus W, Rossi S, Rossini PM, Rothwell J, Sack AT, Thut G, Ugawa Y, Ziemann U, Hallett M, Pascual-Leone A. Training in the practice of noninvasive brain stimulation: Recommendations from an IFCN committee. Clin Neurophysiol. 2021 Mar;132(3):819-837. doi: 10.1016/j.clinph.2020.11.018.

15. Keel JC, Smith MJ, Wassermann EM. A safety screening questionnaire for transcranial magnetic stimulation. Clin Neurophysiol. 2001 Apr;112(4):720. doi: 10.1016/s1388-2457(00)00518-6.

16. Rossi S, Hallett M, Rossini PM, Pascual-Leone A; Safety of TMS Consensus Group. Safety, ethical considerations, and application guidelines for the use of transcranial magnetic stimulation in clinical practice and research. Clin Neurophysiol. 2009 Dec;120(12):2008-2039. doi: 10.1016/j.clinph.2009.08.016.

17. Westin GG, Bassi BD, Lisanby SH, Luber B. Determination of motor threshold using visual observation overestimates transcranial magnetic stimulation dosage: safety implications. Clin Neurophysiol. 2014 Jan;125(1):142-147. doi: 10.1016/j.clinph.2013.06.187.

18. Zhang M, Wang R, Luo X, Zhang S, Zhong X, Ning Y, Zhang B. Repetitive Transcranial Magnetic Stimulation Target Location Methods for Depression. Front Neurosci. 2021 Sep 9;15:695423. doi: 10.3389/fnins.2021.695423.

19. Cole EJ, Stimpson KH, Bentzley BS, Gulser M, Cherian K, Tischler C, Nejad R, Pankow H, Choi E, Aaron H, Espil FM, Pannu J, Xiao X, Duvio D, Solvason HB, Hawkins J, Guerra A, Jo B, Raj KS, Phillips AL, Barmak F, Bishop JH, Coetzee JP, DeBattista C, Keller J, Schatzberg AF, Sudheimer KD, Williams NR. Stanford Accelerated Intelligent Neuromodulation Therapy for Treatment-Resistant Depression. Am J Psychiatry. 2020 Aug 1;177(8):716-726. doi: 10.1176/appi.ajp.2019.19070720.

20. Chang J, Chu Y, Ren Y, Li C, Wang Y, Chu XP. Maintenance treatment of transcranial magnetic stimulation (TMS) for treatment-resistant depression patients responding to acute TMS treatment. Int J Physiol Pathophysiol Pharmacol. 2020 Oct 15;12(5):128-133.

21. Godi SM, Spoorthy MS, Purushotham A, Tikka SK. Repetitive transcranial magnetic stimulation and its role in suicidality - A systematic review. Asian J Psychiatr. 2021 Sep;63:102755. doi: 10.1016/j.ajp.2021.102755.

22. Cheng CM, Li CT, Tsai SJ. Current Updates on Newer Forms of Transcranial Magnetic Stimulation in Major Depression. Adv Exp Med Biol. 2021;1305:333-349. doi: 10.1007/978-981-33-6044-0_18.

23. Chauhan P, Garg S, Tikka SK, Khattri S. Efficacy of Intensive Cerebellar Intermittent Theta Burst Stimulation (iCiTBS) in Treatment-Resistant Schizophrenia: a Randomized Placebo-Controlled Study. Cerebellum. 2021 Feb;20(1):116-123. doi: 10.1007/s12311-020-01193-9.

24. Dutta P, Dhyani M, Garg S, Tikka SK, Khattri S, Mehta S, Mishra J. Efficacy of intensive orbitofrontal continuous Theta Burst Stimulation (iOFcTBS) in Obsessive Compulsive Disorder: A Randomized Placebo Controlled Study. Psychiatry Res. 2021 Apr;298:113784. doi: 10.1016/j.psychres.2021.113784.

25. Tikka SK, Godi SM, Siddique MA, Garg S. Evidence from Indian studies on safety and efficacy of therapeutic transcranial magnetic stimulation across neuropsychiatric disorders- A systematic review and meta-analysis. Manuscript under review. 2022.

26. Ioannidis JP. Integration of evidence from multiple meta-analyses: a primer on umbrella reviews, treatment networks and multiple treatments meta-analyses. CMAJ. 2009 Oct 13;181(8):488-93. doi: 10.1503/cmaj.081086.

Tables

Table 1: The United States Food and Drug Administration (FDA) approval timeline for rTMS equipment

Sl.no	Year	Equipment	Disorder
1	2008	Neuronetics (Neurostar)	MDD
2	2013	Deep TMS (Brainsway)	MDD
3	2013	eNeura	Migraine
4	2015	Rapid^2 (Magstim)	MDD
5	2016	Tonica Elektronik (MagVenture)	MDD
6	2017	Navigated Brain Therapy (NBT) system (Nexstim)	MDD
7	2017	Deep TMS (Brainsway)	OCD
8	2018	Apollo TMS (MAG & More)	MDD
9	2018	Tonica Elektronik (MagVenture) with TBS	MDD
10	2020	Neuronetics (Neurostar) with TBS	MDD
11	2020	Tonica Elektronik (MagVenture)	OCD
12	2020	Deep TMS (Brainsway)	Smoking cessation
13	2020	CloudTMS (Soterix Medical)) along with robotic coil positioning/neuronavigation	-
14	2021	CloudTMS (Soterix Medical)	MDD
15	2020	Deep TMS (Brainsway)	Anxiety comorbid with MDD

TMS=Transcranial Magnetic Stimulation; TBS=Theta Burst Stimulation; MDD=Major Depressive Disorder; OCD=obsessive compulsive disorder

Table 2: Sample technical specification for TMS

1	TMS Stimulator (Essential)	At least 50 Hz capacity with burst mode to deliver theta-burst stimulation (basic model will come with 20 Hz capacity without burst mode)
2	Coils (Essential)	Air or liquid cooled Figure of 8 coils- 2 in number (placebo coil if keen to do research)
3	Accessories (Essential)	TMS Trolley
		TMS coil holder (goose neck)
		TMS chair; a comfortable simplified dental chair
		UPS/Stabilizer unit
4	Others (Desirable)	USFDA/ CE/ ISO certification.
		Integrated EMG interface/set-up
		'Double cone' coils or 'H' coils will be required for stimulation of deeper structures
		Upgradable to add neuro-navigation for coil position and orientation in future.

TMS=Transcranial Magnetic Stimulation; UPS= uninterruptible power supply; USFDA=United States Food and Drug Administration; CE=Conformité Européenne; ISO= International Organization for Standardization; EMG=electromyography

Table 3: Rossi et al. (2009) screening standard questionnaire for rTMS candidates[16]

Sl.no	Questions
1	Do you have epilepsy or have you ever had a convulsion or a seizure?
2	Have you ever had a fainting spell or syncope? If yes, please describe in which occasion(s)
3	Have you ever had severe (i.e., followed by loss of consciousness) head trauma?
4	Do you have any hearing problems or ringing in your ears?
5	Are you pregnant or is there any chance that you might be?
6	Do you have metal in the brain/skull (except titanium)? (e.g., splinters, fragments, clips, etc.)
7	Do you have cochlear implants?
8	Do you have an implanted neurostimulator? (e.g., DBS, epidural/subdural, VNS)
9	Do you have a cardiac pacemaker or intracardiac lines or metal in your body?
10	Do you have a medication infusion device?
11	Are you taking any medications? (Please list)
12	Did you ever have a surgical procedures to your spinal cord?
13	Do you have spinal or ventricular derivations?
14	Did you ever undergo TMS in the past?
15	Did you ever undergo MRI in the past?

Table 4: Meta-analyses on the effect of rTMS in depression

Sl. no	Article	Total no of Studies	Age group	Depression type	rTMS type	Reduction in severity	Response	Remission
1	Valiengo et al 2022	26	>50	MDD	Any rTMS	SMD 0.36 (0.13-0.60)	OR 3.26 (2.11-5.04)	OR 4.63 (2.24-9.55)
2	Voigt et al 2021	10	>18	MDD	Any TBS	NA	RR 2.4 (1.27-4.55)	NA
3	Chu et al 2020	10	16-75	MDD	Any TBS	SMD 0.38 (0.29-0.48)	OR 3.64 (1.61-8.23)	2.45 (1.11-5.42)
4	Nguyen et al 2021	14	Adult	Bipolar Depression	Conventional rTMS	NA	OR 2.72 (1.44-5.14) overall; 2.57 (1.17-5.66) for HF-LDLPFC	-
5	Tee and Au 2020	8	Adult	Bipolar Depression	Conventional rTMS	SMD 0.302 (0.055-0.548)	RD 0.104 (0.018-0.190)	Trend 0.074 (-0.003-0.151)
6	Mutz et al 2019	53	Adult	Any Depression	Any rTMS	SMD 0.83 (0.66-1.00)	OR 6.02 (2.21-16.38) for pTMS, 4.92 (2.93-8.25) for BL rTMS, 4.44 (1.47-13.41) for BL TBS, 3.65 (2.13-6.24) for LF-RDLPFC, 3.20 (1.45-7.08) for iTBS, 3.17 (2.29-4.37) for HF-LDLPFC.	5.21 (2.64-10.29) for LFR; 4.55 (1.39,14.91) for pTMS; 3.30 (1.38,7.90) for TBS; 2.77 (0.47,16.35) BL TBS; 2.67 (1.79,4.00) HFLDLPFC; 2.21 (0.95,5.18) for dTMS; 1.65 (0.46,5.98) for aTMS; 1.59 (0.52,4.81) for sTMS; 1.02 (0.17,6.02) for LF-LDLPFC; 0.51 (0.06,4.24) for cTBS
7	Mutz et al 2018	56	Adult	Both unipolar and bipolar depression	Any rTMS	Hedge's g 0.72 (0.46-0.99) for HF-LDLPFC, 0.29 (0.03-0.55) for deepTMS	OR 3.75 (2.44-5.75) for HF-LDLPFC, 7.44 (2.06-26.83) for LF-RDLPFC, 3.68 1.66-8.13) for BL TMS, 1.69 (1.003-2.85) for deepTMS, 4.70 (1.14-19.38) for iTBS	OR 2.52 (1.62-3.89) for HF-LDLPFC, 14.10 (2.79-71.42) for LF-RDLPFC, 2.24 (1.24-4.06) for deep TMS; 3.05 (0.87-10.67) for BL-rTMS
8	Sonmez et al 2019	8	Any	Any depression	accelerated rTMS & TBS	Hedge's g 1.27 (0.902-1.637)	Accelerated TMS over left DLPFC was not associated with a statistically significantly higher rate of response compared to sham. OR 3.12 (0.98-9.97)	-
9	Hyde et al 2022	46	Any	Unipolar (42) & Bipolar (4)	Any rTMS	SMD 0.44 (0.31-0.56) over all; 0.60 (0.42-0.78) significant for unipolar depression; 0.20 (0.11-0.52) not significant for bipolar depression	-	-
10	Li et al 2021	49	Any	TRD	Any rTMS	-	RR 5.00 (1.11-22.44) for Bilateral theta burst stimulation , 2.97 (1.20-7.39) for priming TMS, 2.62 (1.56-4.39) for LF-RDLPFC, 2.18 (1.52-3.13) for HF-LDLPFC, 3.08 (1.78-5.31) for BL rTMS	-

11	Sehatzadeh et al 2019	23	Any	TRD	Unilateral (19) vs. bilateral (4)	WMD 3.36 (1.85-4.88) for UL; 2.67 (0.83-4.51) for BL	25.1% for UL; 25.4 for BL	16.0% for UL; 16.6% for BL
12	Shen et al 2022	a	Any	Poststoke depression	Any rTMS	SMD 4.92 (2.69-7.15) for immediate effects, 7.21 (3.50-10.92) for longterm effects	-	-
13	Shao et al 2021	7	Any	Poststoke depression	Any rTMS	SMD 1.15 (0.69-1.62)	-	OR 3.46 (1.68-7.12)
14	Liu et al 2019	17	Any	Poststoke depression	HF-rTMS	SMD 1.01 (0.66-1.36)	OR 3.31 (2.25-4.88)	OR 2.72 (1.69-4.38)
15	Liang et al 2022	34	Any	Poststoke depression	HF and LF rTMS	SMD 1.44 (1.03-1.86) for LF augment;	-	-
16	Deng et al 2017	5	Any	Poststoke depression	Any rTMS	SMD 1.43 (1.06 to 1.79)	OR 5.26 (2.17-12.5)	OR 4.72 (1.29 to 17.24)
17	Lee et al 2021	5	Any	Peripartum depression	Any rTMS	SMD 1.394 (0.944-1.843)	-	-
18	Liu et al 2020	10	Any	Peripartum depression	Any rTMS	SMD 0.65 (0.31-0.98)	OR 1.47 (0.99-2.17) Not significant	OR 1.83 (1.05-3.18)
19	Peng et al 2020	14	Any	Postpartum depression	Any rTMS	SMD 1.02 (0.66-1.37)	-	-
20	Tsai et al 2021	5	Any	post TBI depression	Any rTMS	SMD 1.03 (0.20-1.86) over all; 0.98 (0.04-1.92) for LDLPFC	-	-
21	Chen et al 2021	12	Any	Parkinson's depression	Any rTMS	SMD 0.62 (0.28-0.96) vs sham	-	-
22	Li et al 2020	8	Any	Parkinson's depression	Any rTMS	SMD 0.80 (0.31-1.29) over all; 1.64 (0.20-3.09) for LDLPFC; 1.03 (0.41-1.66) for HF rTMS; 0.74 (0.83-2.31) vs. fluoxetine	-	-
23	Hai-Jiao et a 2020l	6	Any	Parkinson's depression	Any rTMS	SMD 0.86 (0.43-1.29) for sham	-	-

rTMS=repetitive transcranial magnetic stimulation; MDD=Major depressive disorder; TRD=Treatment resistant depression; TBI=traumatic brain injury; TBS=theta burst stimulation; iTBS=intermittent theta burst stimulation; cTBS=continuous theta burst stimulation; HF=high frequency; LF=low frequency; SMD=standardized mean difference; WMD=weighted mean difference; LDLPFC= left dorsolateral prefrontal cortex; UL=unilateral; BL=bilateral; OR=odds ratio; RR=relative risk; RD=relative difference; pTMS=priming transcranial magnetic stimulation; dTMS=deep transcranial magnetic stimulation; aTMS=accelerated transcranial magnetic stimulation; sTMS=synchronized transcranial magnetic stimulation; NA=not available

Table 5: Adverse events with rTMS									
Serious adverse event			No-serious adverse event				Drop out due to adverse event		
Active group	Sham group	OR (95%CI;p)	Type	Active group	Sham group	Pooled OR	Active group	Sham group	OR (95%CI;p)
0.9%	1.5%	0.67 (0.29-1.55;0.35)	Headaches	22.6%	16.2%	1.48 (1.15-1.91;0.002)	3.3%	2.3%	1.30 (0.78-2.16;0.31)
			discomfort	10.9%	5.0%	1.98 (1.22-3.21;0.006)			
			Pain at stimulation site	23.8%	5.2%	8.09 (4.71-13.90;<.001)			
rTMS=repetitive transcranial magnetic stimulation; OR=odds ratio; CI=confidence interval; p=significance									

Table 6: Meta-analyses for rTMS in anxiety disorders

Sl.no	Study	Diagnosis	Number of studies included	rTMS forms	Pooled Effect size
1	Cox et al 2022	Generalized anxiety disorder & Panic disorders	13	Any rTMS	SMD 1.45 for anxiety in GAD; SMD 1.65 for depression in GAD; anxiety and panic severity did not improve in PD
2	Parikh et al 2022	Generalized anxiety disorder	6	Any rTMS	SMD 1.857 (1.494-2.219)
3	Hyde et al 2022	Generalized anxiety disorder	5	Any rTMS	SMD 1.8 (1.0-2.6)
rTMS= repetitive transcranial magnetic stimulation; SMD=standardized mean difference; GAD=generalized anxiety disorder; PD=panic disorder					

Table 7: Meta-analyses for rTMS in obsessive compulsive disorder (OCD)					
Sl.no	Article	Total no of Studies	rTMS type	Reduction in severity	Predictors of response
1	Hyde et al 2022	26	Any rTMS	−0.66 (−0.91 to −0.41)	BLDLPFC, LF-RDLPFC and LF-SMA sessions were superior to sham.
2	Fitzsimmons et al 2022	21	Any rTMS	Hedges' g=-0.502 [95%CI= -0.708, -0.296	Network Meta-analysis: LF pre-SMA, HF-LDLPFC, and LF-RDLPFC were all efficacious . LF- RDLPFC was ranked highest in terms of efficacy. 10 TO 30 sessions; 1 to 6 weeks
3	Liang et al 2021	22	Any rTMS	LF-RDLPFC (MD=6.34 (2.12-10.42)); LF-SMA- (MD=4.18 (0.83-7.62)); HF-LDLPFC (MD=3.75 (1.04-6.81));	LF-RDLPFC was most effective All LF-RDLPFC, LF-SMA and HF-LDLPFC were more effective than sham rTMS.
4	Perera et al., 2021	26	Any rTMS	YBOCS scores (Hedges' g=0.77, 95% CI=0.41, 1.14; p<0.0001	The largest significant effect size= BL-DLPFC; HF and LF rTMS showed comparable effects; highest improvements with 800 pulses per session; highest improvement within 2 weeks and effects lasting till 4 weeks
5	Rehn et al 2018	18	Any rTMS	Hedge's g of 0.79 (95% CI = 0.43-1.15, p < 0.001	LF rTMS was more effective than HFrTMS. The effectiveness of rTMS was also greater at 12 weeks follow-up than at 4 weeks; TBS: Ineffective
6	Gao et al 2022	NA	Any rTMS	NA	Both high-frequency and the low-frequency stimulation showed significantly positive effects, with no statistical difference. Targeting the DLPFC showed significant improvements over sham stimulation, but no such improvement was found in the SMA
rTMS= repetitive transcranial magnetic stimulation; TBS=theta burst stimulation; SMD=standardized mean difference; CI=confidence intervals; p=significance; MD=mean difference; YBOCS-Yale Brown obsessive compulsive scale; LDLPFC=left dorsolateral prefrontal cortex; RDLPFC=right dorsolateral prefrontal cortex; BLDLPFC=bilateral dorsolateral prefrontal cortex; SMA= supplementary motor area; HF=high frequency; LF=low frequency;					

Sl.no	Study	Number of studies	rTMS forms	Outcome measure	Pooled Effect size
					Table 8: Meta-analyses for rTMS in post-traumatic stress disorder (PTSD)
1	McGirr et al 2022	10	Any rTMS	PTSD symptoms	SMD 0.70 (0.22 to 1.18) for LF-RDLPFC and 0.71 (0.11-1.31) for HF-RDLPFC
2	Kan et al 2020	11	Any rTMS	PTSD symptoms	SMD 0.975 (0.58-1.37) overall; 1.16 (0.50-1.82) for excitatory (4 HF-RDLPFC, 2 HF-LDLPFC, 1 dTMS at MPFC, 1 HF-LDLPFC); 0.68 (0.32-1.04) for inhibitory (all LF-RDLPFC); no significant difference between HF-RDLPFC and LF-R DLPFC
3	Hyde et al 2022	8	Any rTMS	PTSD symptoms	SMD 1.03 (0.45-1.61)

rTMS= repetitive transcranial magnetic stimulation; PTSD=post-traumatic stress disorder; SMD=standardized mean difference; LDLPFC=left dorsolateral prefrontal cortex; RDLPFC=right dorsolateral prefrontal cortex; MPFC=medial prefrontal cortex; HF=high frequency; LF=low frequency; dTMS=deep transcranial magnetic stimulation

Table 9: Meta-analyses on the effect of rTMS in schizophrenia

Sl. no	Article	Total no of Studies	Symptom group/outcome	rTMS type	Reduction in severity	Predictors of response	Adverse events
1	Guttesen et al 2021	27	Medication resistant auditory verbal hallucinations	Any rTMS	Cohen D SMD -.24 (-0.61 to 0.13) (one month)	not reported	OR: **6.39** [3.13, 13.05] (headache) OR: **16.60** [4.24, 65.09 (facial twitching); 60 dropouts (OR: 1.00, 3.17], p = 0.05)
2	Sloan at al 2021	9	Working Memory: Accuracy/Speed	HF rTMS to LDLPFC	Accuracy: Hedges' g = 0.112, CI95:−0.082, 0.305, = .257; Speed: Hedges' g = 0.233, CI95: −0.212, 0.678, p = .305)	reported; no predictor variables found	not reported
3	Li et al 2020	11	Auditory Hallucinations	LF rTMS to RTPC	Cohen D SMD -0.27, 95%CI = -0.51 to -0.03	not reported	not reported
4	Siskind et al 2019	3	clozapine refractrory schizophrenia	LF & HF rTMS	No benefit PS/NS/Composite	no predictors found on sensitivity analyses	headache (no difference in active/placebo)
5	Aleman et al 2018	19	NS	Any rTMS	Cohen D SMD: 0.64 (0.32–0.96)	Studied; HF rTMS to LDLPFC containing more than 7500 stimuli per week at an intensity of>100% motor threshold, may be more effective than other protocols. The treatment may be more effective in younger patients with a shorter duration of illness.	not reported
6	Kennedy et al 2018	30	Composite Hallucinations/PANSS-P/N/Total	Any rTMS	Hallucinations (Hedge's g =0.51, p < 0.001); NS: (Hedge's g =0.49, p = 0.01)	not reported	not reported
7	Osoegawa et al 2018	31	NS	Any rTMS	Hedges' g=0.19 (0.07–0.32)	not reported	not reported
8	Hyde et al 2022	59	PANSS-PS/NS/Total scores	Any rTMS	NS SMD: −0.49 (−0.73 to −0.26); Total scores SMD: −0.50 (−0.66 to −0.33)	For NS, HF-LDLPFC was superior to sham	not reported

rTMS= repetitive transcranial magnetic stimulation; NS=negative symptoms; PS=positive symptoms; PANSS=positive and negative syndrome scale; SMD=standardized mean difference; LDLPFC=left dorsolateral prefrontal cortex; RTPC=right temporo-parietal cortex; HF=high frequency; LF=low frequency

Table 10: Meta-analyses for rTMS in substance use disorders						
Sl.no	Study	Diagnosis /condition	Number of studies	rTMS forms	Outcome measure	Pooled Effect size	Other remarks
1	Tseng et al 2022	Cigarette smoking	12	Any rTMS	Cigarette smoking frequency	SMD 1.22 (0.66-1.77) for HF-LDLPFC rTMS; 0.77 (0.34-1.20) for HF deep TMS over BL DLPFC	No study was associated with improvement in craving and overall severity of nicotine dependence.
2	Mostafavi et al 2020	Alcohol use disorder	5	Any rTMS	Alcohol craving	Not significant SMD 0.07 (-0.27-0.40)	All targeting RDLPFC
3	Zhang et al 2019	Nicotine, Alcohol, Cannabis, Cocaine, Methamp hetamine, Opioid use disorders	19	Any rTMS	Craving Substance consumption	SMD 0.62 (0.35-0.89) for HF-LDLPFC for all substances; 0.47 (0.12-0.82) for HF-LDLPFC for nicotine; 0.81 (0.37-1.24) for HF-LDLPFC for illicit drugs SMD 0.77 (0.03-1.53) for HF-LDLPFC for nicotine/cocaine; 1.16 (0.68-1.64) for BL DLPFC and Insula deep TMS for nicotine/ alcohol	Not significant for other forms
4	Hyde et al 2022	Substance use disorders in general	4	Any rTMS	Symptoms of SUDs	SMD 1.46 (0.42-3.35) not significant	

rTMS= repetitive transcranial magnetic stimulation; SUD=substance use disorders; SMD=standardized mean difference; LDLPFC=left dorsolateral prefrontal cortex; RDLPFC=right dorsolateral prefrontal cortex; HF=high frequency; LF=low frequency

Table 11: Meta-analyses for rTMS in autism spectrum disorder (ASD)						
Sl.no	Study	Year	Number of studies	rTMS forms	Outcome measure	Pooled Effect size
1	Barahona-Corrêa et al	2018	5 (only controlled studies)	Any rTMS	Repetitive and restricted behaviour	SMD 0.50 (0.16-0.85)
					Social behaviour deficits	SMD 0.47 (0.04-0.98)
					irritability	not significant SMD 0.30 (-0.72-1.32)
2	Huashuang et al	2022	11	Any rTMS	Adverse events	Overall AEs: 25% (18-33%); headache: 10% (3-19%); facial discomfort: 15% (4-29%); irritability 21% (8-37%); pain at the application site: 6% (0-19%); headedness or dizziness: 8% (0-23%)

rTMS= repetitive transcranial magnetic stimulation; ASD=autism spectrum disorders; SMD=standardized mean difference; AEs=adverse effects;

S.no	Study	Year	Number of studies	Condition	rTMS forms	Outcome	Pooled effect size	Remarks
Table 12: Meta-analyses for rTMS in dementia							
1	Teselink et al	2021	19	AD, MCI	Any rTMS	Global cognition	SMD 1.13 (0.44-1.82)	These effects restricted were to rTMS and to patients with AD but not MCI. Younger populations show significantly more improvement.
						Neuro-psychiatric symptoms	SMD 0.78 (0.03-1.53)	
2	Wang et al	2021	28	AD, MCI	Any rTMS	Cognition	NA	LF-RDLPFC, HF-LDLPFC significantly improve the memory. HF-LDLPFC, RDLPFC, BLDLPFC significantly improve the language. HF-LDLPFC improve the executive function Multiple sessions of rTMS with 80% to 100% significantly better
3	Chu et al	2021	27	AD, MCI	Any rTMS	Global cognition	SMD 1.08 (0.37-1.79) for HF-LDLPFC and short term; 1.65 (0.80-2.50) HF-LDLPFC-1 month; no improvements with LF-RDLPFC; HF rTMS had both short-term (1.50, 0.61–2.40) and long-lasting (1.71, 0.86–2.56) positive effects in only AD. not MCI	For short term & 1 month for HF-LDLPFC–Memory (0.72;0.52), working memory (0.32, 0.68). HF-LDLPFC ranked as the best intervention
4	Chou et al	2020	17	AD, MCI	Any rTMS	Global cognition	SMD 0.77 (0.574-0.967); both MCI (0.91) and AD (0.75) were significant. Both short term (0.71) and long term (0.71) significant.	HF-LDLPFC (0.68) and LF-RDLPFC (1.53) significant for memory; HF-rIFG improved executive functions. No serious adverse events, only one study reported dropout due to adverse events
5	Wang et al	2020	15	AD	Any rTMS	Cognition	SMD 0.42 (0.18-0.67)	Stimualtion at multiple sites (0.47), >10 sessions (0.59), HF (20Hz) stimulation (0.41), cotherapy with cognitive training (0.55) and mild-moderate cognitive impairement (0.45) showed significant improvements

6	Lin et al	2019	12	AD	Any rTMS	Cognition	SMD 0.60 (0.35-0.85)	Stimualtion at multiple sites (0.86), >5 sessions (2.77) showed significant improvement. Combined CT was not found significantly different
7	Dong et al	2018	5	AD	Any rTMS	Cognition	MD 3.65 (1.48-5.82) FOR HF-LDLPFC	Significant improvments in global impression with HF-LDLPFC also (0.79). NS for mood, functional performance and LF. Adverse effects mild and few
8	Zhang et al	2021	12	MCI	Any rTMS	Cognition	SMD 0.83 (0.48-0.97)	HF stimulation, multiple sites (i.e. BLDLPFC), and >10 sessions produced higher improvements
9	Cheng et al	2018	7	MCI, Probable AD, AD	Any rTMS	Cognition	SMD 0.48 (0.12-0.84)	High-frequency rTMS showed more benefit and mild-moderate AD were more benefitted. Concurrent cognition enhancement drugs (0.66), cognitive training (0.94) and stimulation at multiple sites (0.94) produced greater effect.
10	Wang et al	2020	7	AD	Any rTMS	BPSD	SMD 0.47 (0.16-0.79) immediately after treatment; 0.57 (0.18-0.96)	HF at BL or LDLPFC
11	Vacas et al	2019	2	AD	Any rTMS	BPSD	SMD 0.58 (0.14-1.02)	HF at BL or LDLPFC

rTMS= repetitive transcranial magnetic stimulation; AD=Alzheimer's Dementia; MCI=mild cognitive impairment; BPSD=behavioural and psychological symptoms of dementia; SMD=standardized mean difference; MD= mean difference; LDLPFC=left dorsolateral prefrontal cortex; RDLPFC=right dorsolateral prefrontal cortex; BL=bilateral; BLDLPFC=bilateral dorsolateral prefrontal cortex; rIFG= right Inferior Frontal Gyrus; HF=high frequency; LF=low frequency; CT=cognitive therapy; NS=not significant;

Table 13: Meta-analyses for rTMS for cognitive functions in various psychiatric disorders						
Sl.no	Study	Year	Cognitive function	Depression (number of studies)	Schizophrenia (number of studies)	Substance use disorders (number of studies)
1	Hyde et al	2022	Attention	Not significant (3)	Not significant (3)	-
			Executive functions	Not significant (8)	Not significant (5)	-
			Processing speed	Not significant (7)	Not significant (5)	-
			Working memory	Not significant (7)	Not significant (10)	SMD 0.66 (0.55-1.87)
2	Begemann et al	2020	Working memory	Not significant (11)	Not significant (9)	
rTMS= repetitive transcranial magnetic stimulation; SMD=standardized mean difference						

Table 14: Meta-analyses for rTMS in insomnia							
Sl.no	Study	Year	Number of studies	Condition	rTMS form	Outcome	Pooled effect size
1	Sun et al	2021	13	Insomnia	Any rTMS	PSQI total score	SMD 2.31 (1.66-2.95)
2	Jiang et al	2019	9	Primary Insomnia	Any rTMS	PSQI total score	SMD 1.44 (1.26-1.63)
3	Ma et al	2021	23	Insomnia	Any rTMS	PSQI total score	SMD 3.94 (3.16-4.73)
rTMS= repetitive transcranial magnetic stimulation; SMD=standardized mean difference; PSQI= Pittsburgh Sleep Quality Index							

Table 15: Meta-analyses for rTMS for Migraine						
Sl.no	Study	Year	Number of trials	rTMS form	Outcome	Pooled effect size	Remarks
1	Cheng et al	2022	19	Any rTMS	Migraine days	MD 8.7 (2.95-14.45) for HF-LMC; 6.28 (1.08-11.47) for HF-LFC	Chronic migraine and episodic migraine similar results
2	Moisset et al	2020	5	Any rTMS	Migraine days	SMD 0.533 (0.126-0.940) for HF-LMC; not significant for HF-LFC	
rTMS= repetitive transcranial magnetic stimulation; SMD=standardized mean difference; MD= mean difference; LMC=left motor cortex; LFC=left frontal cortex; HF=high frequency						

Table 16: Meta-analyses for rTMS for fibromyalgia and chronic pain								
Sl.no	Study	Year	Number of studies	Condition	rTMS form	Outcome	Pooled effect size	Remarks
1	Toh et al	2022	11	Fibromyalgia	Any rTMS	Pain intensity	SMD 0.35 (0.08-0.62)	HF - LMC was best (0.57 (0.23-0.91). Quality of life also showed significant improvement (0.51 (0.23-0.78).
2	Choo et al	2022	10	Fibromyalgia	Any rTMS	Pain intensity	NA	HF-LMC had significant effect immediately and also 1-4 weeks. Quality of life improved at 5-12 weeks. HF-LFC not effective
3	Sun et al	2022	14	Fibromyalgia	Any rTMS	Pain intensity	SMD 0.49 (0.13-0.86)	Fibromyalgia impact (Quality of life) also improved significant (0.50 (0.25-0.75)
4	Cardenas-Rojas et al	2020	2	Chronic regional pain syndrome (arm), cervical dystonia	rTMS & Exercise	Pain intensity	SMD 0.76 (0.11-1.41)	one study HF-LMC and another cerebellar iTBS
5	O'Connel et al	2018	27	Chronic pain	Any rTMS	Pain intensity	SMD 0.22 (0.16-0.29) not significant	Low quality of evidence; Quality of Life (0-1week) SMD 10.80 (6.55-15.04)
rTMS= repetitive transcranial magnetic stimulation; iTBS=intermittent theta burst stimulation; SMD=standardized mean difference; LMC=left motor cortex; LFC=left frontal cortex; HF=high frequency; NA=not available								

Table 17: Meta-analyses for rTMS for chronic tinnitus						
Sl.no	Study	Year	Number of studies	rTMS forms	Outcome	Pooled effect sizes	Remarks
1	Yin et al	2021	12	Any rTMS	Tinnitus handicap-short term	MD 7.05 (2.44-11.65); Was significant at 1 (MD 6.81)and 6 months (MD 7.01) not for immediate	Majority studies used LF-rTMS to Left auditory cortex. No significant impact on tinnitus score and depression
2	Lefebvre-Demers et al	2021	28	Any rTMS	Tinnitus severity	SMD 0.45 (0.24-0.66) immediate; 0.42 (0.15-0.68) 1 week to 6 months)	Auditory cortex better than others (0.35)
3	Liang et al	2020	29	Any rTMS	Tinnitus handicap	MD 7.92 (1.66-14.18) for 1 week; 8.52 (4.55-12.49) for 1 month; 6.53 (1.66-11.41) for 6 months	NA
					Tinnitus severity	MD 8.54 (1.52-15.56) for only 1 week, not for long term	
4	Dong et al	2020	10	LF rTMS	Tinnitus handicap, severity, loudness	None were significant	Well tolerated but not effective
5	Chen et al	2020	13	Any rTMS	Tinnitus severity	SMD 0.79 (0.01-1.57) for cTBS on BL AC; 0.70 (0.02-1.38) BL (i.e. HF LFC+LF BL AC)	BL better than UL AC, priming superior to non-priming

rTMS= repetitive transcranial magnetic stimulation; cTBS=continuous theta burst stimulation; SMD=standardized mean difference; MD=mean difference; AC= auditory cortex; LFC=left frontal cortex; HF=high frequency; LF=low frequency; UL=unilateral; BL=bilateral; NA=not available

Table 18: Indications and evidence for rTMS in treatment of various psychiatric disorders				
Disorder/Condition	Mode	Target	Recommendation	FDA
Depression Acute/Unipolar	HF	Left DLPFC	**Strong**	**Yes**
	LF	Right DLPFC	**Moderate**	
	Bilateral (HF to Left and LF to Right DLPFC)		**Low**	
	iTBS	Left DLPFC		
	Bilateral (iTBS to Left and cTBS to Right DLPFC)			
	Deep 'H1' HF	Left DLPFC		
	Priming (HF followed by LF)	Right DLPFC		
Bipolar depression	HF	Left DLPFC	**Moderate**	**Yes**
Treatment resistant depression	HF	Left DLPFC	**Moderate**	**Yes**
	LF	Right DLPFC	**Low**	**Yes**
Peripartum depression	HF	Left DLPFC	**Moderate**	No
	LF	Right DLPFC	**Low**	
Post-stroke depression	HF	Left DLPFC	**Moderate**	No
Depression in Parkinson's Disease	HF	Left DLPFC	**Moderate**	No
Generalized Anxiety Disorder	LF	Right DLPFC	**Moderate**	No
Obsessive Compulsive Disorder	LF	Right DLPFC	**Moderate**	**Yes**
	HF	Bilateral DLPFC	**Low**	
	LF	SMA	**Low**	No
Post-Traumatic Stress Disorder	HF	Right DLPFC	**Moderate**	No
	LF	Right DLPFC		No
Schizophrenia-Auditory Hallucinations	LF	Left TPC (TPJ+STG)	**Low**	No
Schizophrenia-Negative symptoms	HF	Left DLPFC	**Moderate**	No
Nicotine Use Disorder (Smoking Cessation)	HF	Left DLPFC	**Low**	No
Alzheimer's Dementia	HF	Bilateral DLPFC	**Moderate**	No
	HF	Left DLPFC		No
	LF	Right DLPFC	**Low**	No
Insomnia	LF	Right DLPFC	**Moderate**	
Migraine	HF	Primary Motor Cortex	**Moderate**	
Fibromyalgia	HF	Primary Motor Cortex	**Low**	
Chronic Tinnitus	LF	Primary Auditory Cortex	**Low**	

rTMS= repetitive transcranial magnetic stimulation; iTBS=intermittent theta burst stimulation; cTBS=continuous theta burst stimulation; HF=high frequency; LF=low frequency; DLPFC=dorsolateral prefrontal cortex; TPC=temporoparietal cortex; TPJ=temporoparietal junction; STG=superior temporal gyrus; FDA=Food and Drug Administration
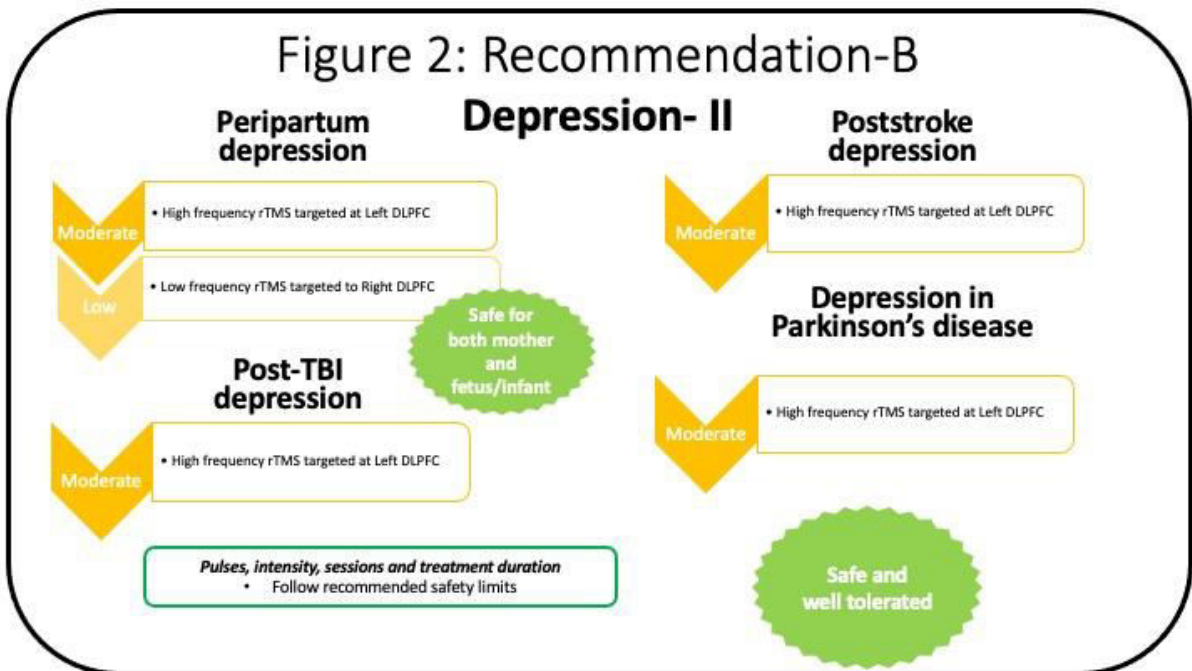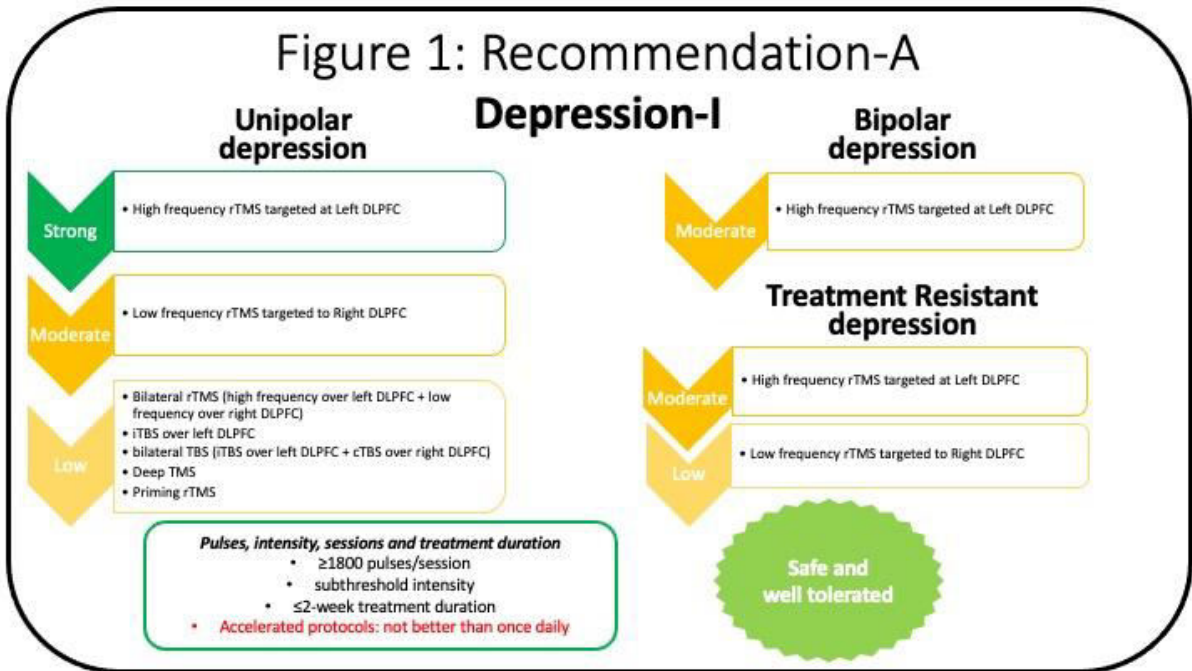
Figure 1: Recommendation-A

Figure 2: Recommendation-B
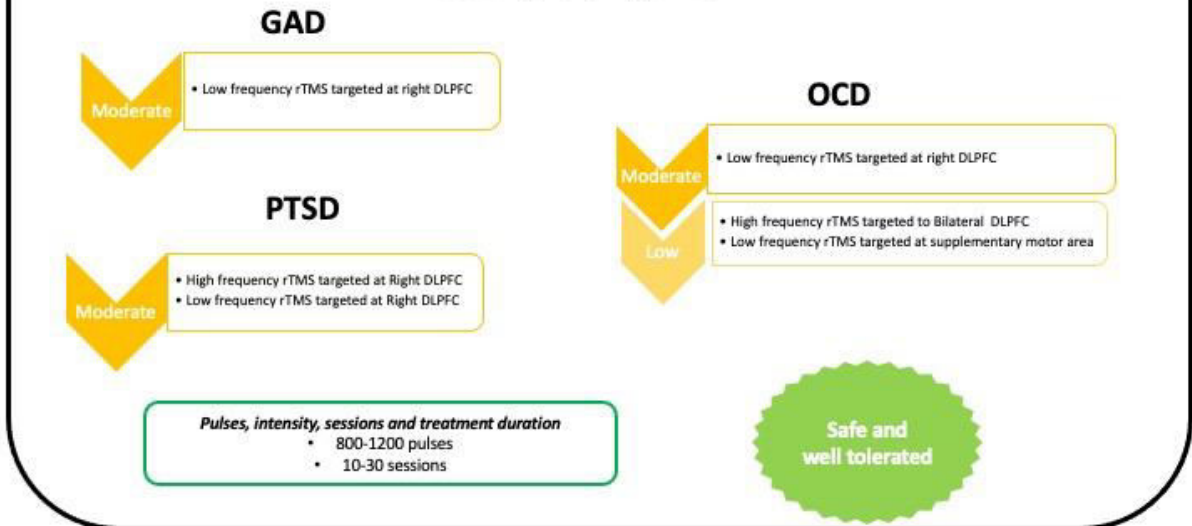
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Figure 3: Recommendation-C
GAD, OCD, PTSD

GAD

Moderate
- Low frequency rTMS targeted at right DLPFC

OCD

Moderate
- Low frequency rTMS targeted at right DLPFC

Low
- High frequency rTMS targeted to Bilateral DLPFC
- Low frequency rTMS targeted at supplementary motor area

PTSD

Moderate
- High frequency rTMS targeted at Right DLPFC
- Low frequency rTMS targeted at Right DLPFC

Pulses, intensity, sessions and treatment duration
- 800-1200 pulses
- 10-30 sessions

Safe and well tolerated

Figure 4: Recommendation-D
Schizophrenia

Resistant Auditory Hallucinations

Low
- Low frequency rTMS targeted at left temporo-parietal cortex

Negative symptoms

Moderate
- High frequency rTMS targeted at left DLPFC

Pulses, intensity, sessions and treatment duration
- 1500 pulses
- >10 sessions
- >100% threshold

Safe and well tolerated

Figure 5: Recommendation-E

Substance use disorder

**Nicotine use disorder
(Smoking)**

Low
- High frequency rTMS targeted at left DLPFC

Pulses, intensity, sessions and treatment duration
- Follow recommended safety limits

Safe and well tolerated
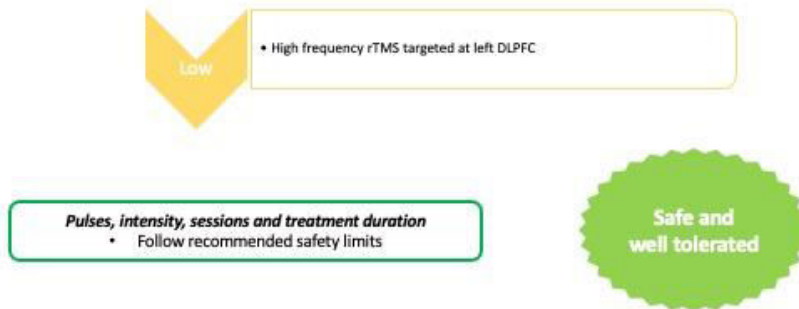
Figure 6: Recommendation-F

Alzheimer's dementia

Global cognition and BPSD

Moderate
- High frequency rTMS targeted at Bilateral DLPFC
- High frequency rTMS targeted at Left DLPFC

Low
- Low frequency rTMS targeted at right DLPFC

Pulses, intensity, sessions and treatment duration
- >5-10 sessions
- Follow recommended safety limits

Safe and well tolerated
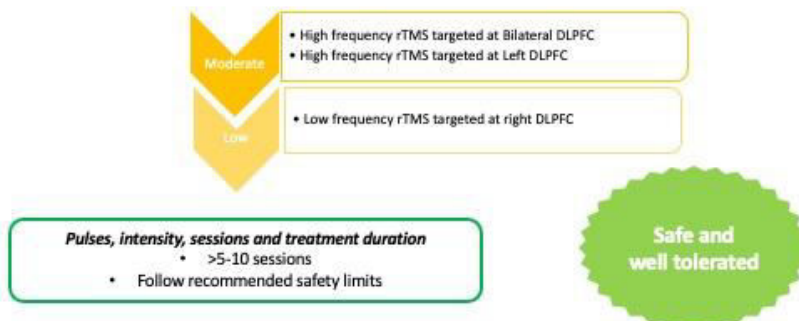
Figure 7: Recommendation-G

Insomnia, Headache, Pain, Tinnitus

Insomnia

Moderate
- Low frequency rTMS targeted at right DLPFC

Fibromyalgia

Low
- High frequency rTMS targeted at primary motor cortex

Migraine

Moderate
- High frequency rTMS targeted at primary motor cortex

Chronic Tinnitus

Low
- Low frequency rTMS targeted at primary auditory cortex

Pulses, intensity, sessions and treatment duration
- Follow recommended safety limits

Safe and well tolerated

Figure 8: Recommendation-H

Available positive evidence/Indications

Depression (unipolar, bipolar treatment resistant depression)

Peripartum depression

Post-stroke depression, depression associated with Parkinson's disease

Generalized Anxiety Disorder

Obsessive Compulsive Disorder

Post Traumatic Stress Disorder

Schizophrenia (negative symptoms and resistant auditory hallucinations)

Nicotine use disorder (smoking cessation)

Alzheimer's Dementia

Insomnia

Migraine

Fibromyalgia, Tinnitus

Insufficient or negative sham-controlled evidence

Suicidality

Maintenance treatment of depression

Mania/ Bipolar mania

Panic disorder

Tourette disorder

Positive symptoms (except resistant auditory hallucinations) of schizophrenia

Treatment resistant schizophrenia

Substance use disorders except smoked nicotine

ADHD

Autism Spectrum Disorder (Lack of evidence for uniformity in rTMS form and target location)

Specific learning disorder; Intellectual disability

Tension type Headache

PNES (Dissociative disorders)

Supplementary table 1: List of all meta-analyses included for umbrella review

Sl. no	Authors	Title	Citation
1	Valiengo L, Maia A, Cotovio G, Gordon PC, Brunoni AR, Forlenza OV, Oliveira-Maia AJ.	Repetitive Transcranial Magnetic Stimulation for Major Depressive Disorder in Older Adults: Systematic Review and Meta-analysis	J Gerontol A Biol Sci Med Sci. 2022 Apr 1;77(4):851-860. doi: 10.1093/gerona/glab235.
2	Voigt JD, Leuchter AF, Carpenter LL.	Theta burst stimulation for the acute treatment of major depressive disorder: A systematic review and meta-analysis	Transl Psychiatry. 2021 May 28;11(1):330. doi: 10.1038/s41398-021-01441-4.
3	Chu HT, Cheng CM, Liang CS, Chang WH, Juan CH, Huang YZ, Jeng JS, Bai YM, Tsai SJ, Chen MH, Li CT.	Efficacy and tolerability of theta-burst stimulation for major depression: A systematic review and meta-analysis	Prog Neuropsychopharmacol Biol Psychiatry. 2021 Mar 2;106:110168. doi: 10.1016/j.pnpbp.2020.110168. Epub 2020 Nov 7.
4	Nguyen TD, Hieronymus F, Lorentzen R, McGirr A, Østergaard SD.	The efficacy of repetitive transcranial magnetic stimulation (rTMS) for bipolar depression: A systematic review and meta-analysis	J Affect Disord. 2021 Jan 15;279:250-255. doi: 10.1016/j.jad.2020.10.013. Epub 2020 Oct 8.
5	Tee MMK, Au CH.	A Systematic Review and Meta-Analysis of Randomized Sham-Controlled Trials of Repetitive Transcranial Magnetic Stimulation for Bipolar Disorder	Psychiatr Q. 2020 Dec;91(4):1225-1247. doi: 10.1007/s11126-020-09822-6.
6	Mutz J, Vipulananthan V, Carter B, Hurlemann R, Fu CHY, Young AH.	Comparative efficacy and acceptability of non-surgical brain stimulation for the acute treatment of major depressive episodes in adults: systematic review and network meta-analysis	BMJ. 2019 Mar 27;364:l1079. doi: 10.1136/bmj.l1079.
7	Mutz J, Edgcumbe DR, Brunoni AR, Fu CHY.	Efficacy and acceptability of non-invasive brain stimulation for the treatment of adult unipolar and bipolar depression: A systematic review and meta-analysis of randomised sham-controlled trials	Neurosci Biobehav Rev. 2018 Sep;92:291-303. doi: 10.1016/j.neubiorev.2018.05.015. Epub 2018 May 12.
8	Sonmez AI, Camsari DD, Nandakumar AL, Voort JLV, Kung S, Lewis CP, Croarkin PE.	Accelerated TMS for Depression: A systematic review and meta-analysis	Psychiatry Res. 2019 Mar;273:770-781. doi: 10.1016/j.psychres.2018.12.041. Epub 2018 Dec 7.
9	Hyde J, Carr H, Kelley N, Seneviratne R, Reed C, Parlatini V, Garner M, Solmi M, Rosson S, Cortese S, Brandt V.	Efficacy of neurostimulation across mental disorders: systematic review and meta-analysis of 208 randomized controlled trials	Mol Psychiatry. 2022 Jun;27(6):2709-2719. doi: 10.1038/s41380-022-01524-8. Epub 2022 Apr 1.
10	Li H, Cui L, Li J, Liu Y, Chen Y.	Comparative efficacy and acceptability of neuromodulation procedures in the treatment of treatment-resistant depression: a network meta-analysis of randomized controlled trials	J Affect Disord. 2021 May 15;287:115-124. doi: 10.1016/j.jad.2021.03.019. Epub 2021 Mar 11.
11	Sehatzadeh S, Daskalakis ZJ, Yap B, Tu HA, Palimaka S, Bowen JM, O'Reilly DJ.	Unilateral and bilateral repetitive transcranial magnetic stimulation for treatment-resistant depression: a meta-analysis of randomized controlled trials over 2 decades	J Psychiatry Neurosci. 2019 May 1;44(3):151-163. doi: 10.1503/jpn.180056.
12	Shen Y, Cai Z, Liu F, Zhang Z, Ni G.	Repetitive Transcranial Magnetic Stimulation and Transcranial Direct Current Stimulation as Treatment of Poststroke Depression: A Systematic Review and Meta-Analysis	Neurologist. 2022 Jul 1;27(4):177-182. doi: 10.1097/NRL.0000000000000416.
13	Shao D, Zhao ZN, Zhang YQ, Zhou XY, Zhao LB, Dong M, Xu FH, Xiang YJ, Luo HY.	Efficacy of repetitive transcranial magnetic stimulation for post-stroke depression: a systematic review and meta-analysis of randomized clinical trials	Braz J Med Biol Res. 2021 Jan 15;54(3):e10010. doi: 10.1590/1414-431X202010010. eCollection 2021.
14	Liu C, Pan W, Jia L, Li L, Zhang X, Ren Y, Ma X.	Efficacy and safety of repetitive transcranial magnetic stimulation for peripartum depression: A meta-analysis of randomized controlled trials	Psychiatry Res. 2020 Dec;294:113543. doi: 10.1016/j.psychres.2020.113543. Epub 2020 Oct 27.
15	Liang J, Feng J, He J, Jiang Y, Zhang H, Chen H.	Effects of Noninvasive Brain Stimulation Combined With Antidepressants in Patients With Poststroke Depression: A Systematic Review and Meta-Analysis	Front Pharmacol. 2022 May 19;13:887115. doi: 10.3389/fphar.2022.887115. eCollection 2022.
16	Deng L, Sun X, Qiu S, Xiong Y, Li Y, Wang L, Wei Q,	Interventions for management of post-stroke depression: A Bayesian network meta-analysis of 23 randomized	Sci Rep. 2017 Nov 28;7(1):16466. doi:

	Wang D, Liu M.	controlled trials	10.1038/s41598-017-16663-0.
17	Lee HJ, Kim SM, Kwon JY.	Repetitive transcranial magnetic stimulation treatment for peripartum depression: systematic review & meta-analysis	BMC Pregnancy Childbirth. 2021 Feb 9;21(1):118. doi: 10.1186/s12884-021-03600-3.
18	Liu C, Wang M, Liang X, Xue J, Zhang G.	Efficacy and Safety of High-Frequency Repetitive Transcranial Magnetic Stimulation for Poststroke Depression: A Systematic Review and Meta-analysis	Arch Phys Med Rehabil. 2019 Oct;100(10):1964-1975. doi: 10.1016/j.apmr.2019.03.012. Epub 2019 Apr 17.
19	Peng L, Fu C, Xiong F, Zhang Q, Liang Z, Chen L, He C, Wei Q.	Effects of repetitive transcranial magnetic stimulation on depression symptoms and cognitive function in treating patients with postpartum depression: A systematic review and meta-analysis of randomized controlled trials	Psychiatry Res. 2020 Aug;290:113124. doi: 10.1016/j.psychres.2020.113124. Epub 2020 May 29.
20	Tsai PY, Chen YC, Wang JY, Chung KH, Lai CH.	Effect of repetitive transcranial magnetic stimulation on depression and cognition in individuals with traumatic brain injury: a systematic review and meta-analysis	Sci Rep. 2021 Aug 20;11(1):16940. doi: 10.1038/s41598-021-95838-2.
21	Chen J, He P, Zhang Y, Gao Y, Qiu Y, Li Y, Zhang Q, Wang L, Huang Z, Zhao J, Nie K, Wang L.	Non-pharmacological treatment for Parkinson disease patients with depression: a meta-analysis of repetitive transcranial magnetic stimulation and cognitive-behavioral treatment	Int J Neurosci. 2021 Apr;131(4):411-424. doi: 10.1080/00207454.2020.1744591. Epub 2020 Apr 7.
22	Li S, Jiao R, Zhou X, Chen S.	Motor recovery and antidepressant effects of repetitive transcranial magnetic stimulation on Parkinson disease: A PRISMA-compliant meta-analysis	Medicine (Baltimore). 2020 May;99(18):e19642. doi: 10.1097/MD.0000000000019642.
23	Hai-Jiao W, Ge T, Li-Na Z, Deng C, Da X, Shan-Shan C, Liu L.	The efficacy of repetitive transcranial magnetic stimulation for Parkinson disease patients with depression	Int J Neurosci. 2020 Jan;130(1):19-27. doi: 10.1080/00207454.2018.1495632. Epub 2019 Oct 15.
24	Matsuda Y, Yamazaki R, Kishi T, Iwata N, Shigeta M, Kito S.	Comparative Efficacy and Acceptability of 3 Repetitive Transcranial Magnetic Stimulation Devices for Depression: A Meta-Analysis of Randomized, Sham-Controlled Trials	Neuropsychobiology. 2022;81(1):60-68. doi: 10.1159/000517859. Epub 2021 Jul 28.
25	Gellersen HM, Kedzior KK.	Antidepressant outcomes of high-frequency repetitive transcranial magnetic stimulation (rTMS) with F8-coil and deep transcranial magnetic stimulation (DTMS) with H1-coil in major depression: a systematic review and meta-analysis	BMC Psychiatry. 2019 May 7;19(1):139. doi: 10.1186/s12888-019-2106-7.
26	Senova S, Cotovio G, Pascual-Leone A, Oliveira-Maia AJ.	Durability of antidepressant response to repetitive transcranial magnetic stimulation: Systematic review and meta-analysis	Brain Stimul. 2019 Jan-Feb;12(1):119-128. doi: 10.1016/j.brs.2018.10.001. Epub 2018 Oct 2.
27	Razza LB, Moffa AH, Moreno ML, Carvalho AF, Padberg F, Fregni F, Brunoni AR.	A systematic review and meta-analysis on placebo response to repetitive transcranial magnetic stimulation for depression trials	Prog Neuropsychopharmacol Biol Psychiatry. 2018 Feb 2;81:105-113. doi: 10.1016/j.pnpbp.2017.10.016. Epub 2017 Oct 28.
28	Burke MJ, Romanella SM, Mencarelli L, Greben R, Fox MD, Kaptchuk TJ, Pascual-Leone A, Santarnecchi E.	Placebo effects and neuromodulation for depression: a meta-analysis and evaluation of shared mechanisms	Mol Psychiatry. 2022 Mar;27(3):1658-1666. doi: 10.1038/s41380-021-01397-3. Epub 2021 Dec 14.
29	Wang WL, Wang SY, Hung HY, Chen MH, Juan CH, Li CT.	Safety of transcranial magnetic stimulation in unipolar depression: A systematic review and meta-analysis of randomized-controlled trials	J Affect Disord. 2022 Mar 15;301:400-425. doi: 10.1016/j.jad.2022.01.047. Epub 2022 Jan 13.
30	Miuli A, Sepede G, Stigliano G, Mosca A, Di Carlo F, d'Andrea G, Lalli A, Spano MC, Pettorruso M, Martinotti G, di Giannantonio M.	Hypomanic/manic switch after transcranial magnetic stimulation in mood disorders: A systematic review and meta-analysis	World J Psychiatry. 2021 Aug 19;11(8):477-490. doi: 10.5498/wjp.v11.i8.477. eCollection 2021 Aug 19.
31	He J, Tang Y, Lin J, Faulkner G, Tsang HWH, Chan SHW.	Non-invasive brain stimulation combined with psychosocial intervention for depression: a systematic review and meta-analysis	BMC Psychiatry. 2022 Apr 19;22(1):273. doi: 10.1186/s12888-022-03843-0.
32	Chen GW, Hsu TW, Ching PY, Pan CC, Chou PH, Chu CS.	Efficacy and Tolerability of Repetitive Transcranial Magnetic Stimulation on Suicidal Ideation: A Systemic Review and Meta-Analysis	Front Psychiatry. 2022 May 6;13:884390. doi: 10.3389/fpsyt.2022.884390. eCollection 2022.
33	Mehta S, Konstantinou G, Weissman CR, Daskalakis	The Effect of Repetitive Transcranial Magnetic Stimulation on Suicidal Ideation in Treatment-Resistant	J Clin Psychiatry. 2022 Jan 18;83(2):21r13969. doi:

	ZJ, Voineskos D, Downar J, Mulsant BH, Blumberger DM.	Depression: A Meta-Analysis	10.4088/JCP.21r13969.
34	Godi SM, Spoorthy MS, Purushotham A, Tikka SK.	Repetitive transcranial magnetic stimulation and its role in suicidality - A systematic review	Asian J Psychiatr. 2021 Sep;63:102755. doi: 10.1016/j.ajp.2021.102755. Epub 2021 Jul 9.
35	Vergallito A, Gallucci A, Pisoni A, Punzi M, Caselli G, Ruggiero GM, Sassaroli S, Romero Lauro LJ.	Effectiveness of noninvasive brain stimulation in the treatment of anxiety disorders: a meta-analysis of sham or behaviour-controlled studies	J Psychiatry Neurosci. 2021 Nov 9;46(6):E592-E614. doi: 10.1503/jpn.210050. Print 2021 Nov-Dec.
36	Cox J, Thakur B, Alvarado L, Shokar N, Thompson PM, Dwivedi AK.	Repetitive transcranial magnetic stimulation for generalized anxiety and panic disorders: A systematic review and meta-analysis	Ann Clin Psychiatry. 2022 May;34(2):e2-e24. doi: 10.12788/acp.0050.
37	Parikh TK, Strawn JR, Walkup JT, Croarkin PE.	Repetitive Transcranial Magnetic Stimulation for Generalized Anxiety Disorder: A Systematic Literature Review and Meta-Analysis	Int J Neuropsychopharmacol. 2022 Feb 11;25(2):144-146. doi: 10.1093/ijnp/pyab077.
38	Gao T, Du J, Tian S, Liu W.	A meta-analysis of the effects of non-invasive brain stimulation on obsessive-compulsive disorder	Psychiatry Res. 2022 Jun;312:114530. doi: 10.1016/j.psychres.2022.114530. Epub 2022 Mar 30.
39	Fitzsimmons SMDD, van der Werf YD, van Campen AD, Arns M, Sack AT, Hoogendoorn AW; other members of the TETRO Consortium, van den Heuvel OA.	Repetitive transcranial magnetic stimulation for obsessive-compulsive disorder: A systematic review and pairwise/network meta-analysis	J Affect Disord. 2022 Apr 1;302:302-312. doi: 10.1016/j.jad.2022.01.048. Epub 2022 Jan 15.
40	Liang K, Li H, Bu X, Li X, Cao L, Liu J, Gao Y, Li B, Qiu C, Bao W, Zhang S, Hu X, Xing H, Gong Q, Huang X.	Efficacy and tolerability of repetitive transcranial magnetic stimulation for the treatment of obsessive-compulsive disorder in adults: a systematic review and network meta-analysis	Transl Psychiatry. 2021 May 28;11(1):332. doi: 10.1038/s41398-021-01453-0.
41	Perera MPN, Mallawaarachchi S, Miljevic A, Bailey NW, Herring SE, Fitzgerald PB.	Repetitive Transcranial Magnetic Stimulation for Obsessive-Compulsive Disorder: A Meta-analysis of Randomized, Sham-Controlled Trials	Biol Psychiatry Cogn Neurosci Neuroimaging. 2021 Oct;6(10):947-960. doi: 10.1016/j.bpsc.2021.03.010. Epub 2021 Mar 26.
42	Rehn S, Eslick GD, Brakoulias V.	A Meta-Analysis of the Effectiveness of Different Cortical Targets Used in Repetitive Transcranial Magnetic Stimulation (rTMS) for the Treatment of Obsessive-Compulsive Disorder (OCD)	Psychiatr Q. 2018 Sep;89(3):645-665. doi: 10.1007/s11126-018-9566-7.
43	Hsu CW, Wang LJ, Lin PY.	Efficacy of repetitive transcranial magnetic stimulation for Tourette syndrome: A systematic review and meta-analysis	Brain Stimul. 2018 Sep-Oct;11(5):1110-1118. doi: 10.1016/j.brs.2018.06.002. Epub 2018 Jun 5.
44	McGirr A, Devoe DJ, Raedler A, Debert CT, Ismail Z, Berlim MT.	Repetitive Transcranial Magnetic Stimulation for the Treatment of Post-traumatic Stress Disorder: A Systematic Review and Network Meta-analysis.	Can J Psychiatry. 2021 Sep;66(9):763-773. doi: 10.1177/0706743720982432. Epub 2020 Dec 23.
45	Kan RLD, Zhang BBB, Zhang JJQ, Kranz GS.	Non-invasive brain stimulation for posttraumatic stress disorder: a systematic review and meta-analysis	Transl Psychiatry. 2020 May 28;10(1):168. doi: 10.1038/s41398-020-0851-5.
46	Guttesen LL, Albert N, Nordentoft M, Hjorthøj C.	Repetitive transcranial magnetic stimulation and transcranial direct current stimulation for auditory hallucinations in schizophrenia: Systematic review and meta-analysis	J Psychiatr Res. 2021 Nov;143:163-175. doi: 10.1016/j.jpsychires.2021.09.001. Epub 2021 Sep 3.
47	Sloan NP, Byrne LK, Enticott PG, Lum JAG.	Non-Invasive Brain Stimulation Does Not Improve Working Memory in Schizophrenia: A Meta-Analysis of Randomised Controlled Trials	Neuropsychol Rev. 2021 Mar;31(1):115-138. doi: 10.1007/s11065-020-09454-4. Epub 2020 Sep 12.
48	Li J, Cao X, Liu S, Li X, Xu Y.	Efficacy of repetitive transcranial magnetic stimulation on auditory hallucinations in schizophrenia: A meta-analysis	Psychiatry Res. 2020 Aug;290:113141. doi: 10.1016/j.psychres.2020.113141. Epub 2020 May 29.
49	Siskind D, Honarparvar F,	rTMS for clozapine refractory schizophrenia - A	Schizophr Res. 2019

	Hasan A, Wagner E, Sinha S, Orr S, Kisely S.	systematic review and pairwise meta-analysis	Sep;211:113-114. doi: 10.1016/j.schres.2019.07.004. Epub 2019 Jul 11.
50	Aleman A, Enriquez-Geppert S, Knegtering H, Dlabac-de Lange JJ.	Moderate effects of noninvasive brain stimulation of the frontal cortex for improving negative symptoms in schizophrenia: Meta-analysis of controlled trials	Neurosci Biobehav Rev. 2018 Jun;89:111-118. doi: 10.1016/j.neubiorev.2018.02.009. Epub 2018 Feb 19.
51	Kennedy NI, Lee WH, Frangou S.	Efficacy of non-invasive brain stimulation on the symptom dimensions of schizophrenia: A meta-analysis of randomized controlled trials	Eur Psychiatry. 2018 Mar;49:69-77. doi: 10.1016/j.eurpsy.2017.12.025. Epub 2018 Feb 3.
52	Osoegawa C, Gomes JS, Grigolon RB, Brietzke E, Gadelha A, Lacerda ALT, Dias ÁM, Cordeiro Q, Laranjeira R, de Jesus D, Daskalakis ZJ, Brunelin J, Cordes J, Trevizol AP.	Non-invasive brain stimulation for negative symptoms in schizophrenia: An updated systematic review and meta-analysis	Schizophr Res. 2018 Jul;197:34-44. doi: 10.1016/j.schres.2018.01.010. Epub 2018 Feb 4.
53	Song S, Zilverstand A, Gui W, Pan X, Zhou X.	Reducing craving and consumption in individuals with drug addiction, obesity or overeating through neuromodulation intervention: a systematic review and meta-analysis of its follow-up effects	Addiction. 2022 May;117(5):1242-1255. doi: 10.1111/add.15686. Epub 2021 Oct 21.
54	Song S, Zilverstand A, Gui W, Li HJ, Zhou X.	Effects of single-session versus multi-session non-invasive brain stimulation on craving and consumption in individuals with drug addiction, eating disorders or obesity: A meta-analysis	Brain Stimul. 2019 May-Jun;12(3):606-618. doi: 10.1016/j.brs.2018.12.975. Epub 2018 Dec 27.
55	Tseng PT, Jeng JS, Zeng BS, Stubbs B, Carvalho AF, Brunoni AR, Su KP, Tu YK, Wu YC, Chen TY, Lin PY, Liang CS, Hsu CW, Chen YW, Li CT.	Efficacy of non-invasive brain stimulation interventions in reducing smoking frequency in patients with nicotine dependence: a systematic review and network meta-analysis of randomized controlled trials	Addiction. 2022 Jul;117(7):1830-1842. doi: 10.1111/add.15624. Epub 2021 Aug 4.
56	Mostafavi SA, Khaleghi A, Mohammadi MR.	Noninvasive brain stimulation in alcohol craving: A systematic review and meta-analysis	Prog Neuropsychopharmacol Biol Psychiatry. 2020 Jul 13;101:109938. doi: 10.1016/j.pnpbp.2020.109938. Epub 2020 Mar 29.
57	Zhang JJQ, Fong KNK, Ouyang RG, Siu AMH, Kranz GS.	Effects of repetitive transcranial magnetic stimulation (rTMS) on craving and substance consumption in patients with substance dependence: a systematic review and meta-analysis	Addiction. 2019 Dec;114(12):2137-2149. doi: 10.1111/add.14753. Epub 2019 Aug 16.
58	Xu K, Yi P, Liu J, Ren J, Zhang Q, Yu L, Yang Y, Wang Y, Ma L, Zhang Y, Li X.	Non-invasive brain stimulation interventions for treating Clinical and Sub-clinical eating disorders: A meta-analysis of randomized controlled trials and nonrandomized studies	Psychiatry Res. 2022 Jul;313:114592. doi: 10.1016/j.psychres.2022.114592. Epub 2022 May 1.
59	Westwood SJ, Radua J, Rubia K.	Noninvasive brain stimulation in children and adults with attention-deficit/hyperactivity disorder: a systematic review and meta-analysis	J Psychiatry Neurosci. 2021 Jan 4;46(1):E14-E33. doi: 10.1503/jpn.190179.
60	Barahona-Corrêa JB, Velosa A, Chainho A, Lopes R, Oliveira-Maia AJ.	Repetitive Transcranial Magnetic Stimulation for Treatment of Autism Spectrum Disorder: A Systematic Review and Meta-Analysis	Front Integr Neurosci. 2018 Jul 9;12:27. doi: 10.3389/fnint.2018.00027. eCollection 2018.
61	Huashuang Z, Yang L, Chensheng H, Jing X, Bo C, Dongming Z, Kangfu L, Shi-Bin W.	Prevalence of Adverse Effects Associated With Transcranial Magnetic Stimulation for Autism Spectrum Disorder: A Systematic Review and Meta-Analysis	Front Psychiatry. 2022 May 23;13:875591. doi: 10.3389/fpsyt.2022.875591. eCollection 2022.
62	Teselink J, Bawa KK, Koo GK, Sankhe K, Liu CS, Rapoport M, Oh P, Marzolini S, Gallagher D, Swardfager W, Herrmann N, Lanctôt KL.	Efficacy of non-invasive brain stimulation on global cognition and neuropsychiatric symptoms in Alzheimer's disease and mild cognitive impairment: A meta-analysis and systematic review	Ageing Res Rev. 2021 Dec;72:101499. doi: 10.1016/j.arr.2021.101499. Epub 2021 Oct 23.
63	Wang T, Guo Z, Du Y, Xiong M, Yang Z, Ren L, He L, Jiang Y, McClure MA, Mu Q.	Effects of Noninvasive Brain Stimulation (NIBS) on Cognitive Impairment in Mild Cognitive Impairment and Alzheimer Disease: A Meta-analysis	Alzheimer Dis Assoc Disord. 2021 Jul-Sep 01;35(3):278-288. doi: 10.1097/WAD.0000000000000464.

64	Chu CS, Li CT, Brunoni AR, Yang FC, Tseng PT, Tu YK, Stubbs B, Carvalho AF, Thompson T, Rajji TK, Yeh TC, Tsai CK, Chen TY, Li DJ, Hsu CW, Wu YC, Yu CL, Liang CS.	Cognitive effects and acceptability of non-invasive brain stimulation on Alzheimer's disease and mild cognitive impairment: a component network meta-analysis	J Neurol Neurosurg Psychiatry. 2021 Feb;92(2):195-203. doi: 10.1136/jnnp-2020-323870. Epub 2020 Oct 28.
65	Chou YH, Ton That V, Sundman M.	A systematic review and meta-analysis of rTMS effects on cognitive enhancement in mild cognitive impairment and Alzheimer's disease	Neurobiol Aging. 2020 Feb;86:1-10. doi: 10.1016/j.neurobiolaging.2019.08.020. Epub 2019 Aug 27.
66	Wang X, Mao Z, Ling Z, Yu X.	Repetitive transcranial magnetic stimulation for cognitive impairment in Alzheimer's disease: a meta-analysis of randomized controlled trials	J Neurol. 2020 Mar;267(3):791-801. doi: 10.1007/s00415-019-09644-y. Epub 2019 Nov 23.
67	Lin Y, Jiang WJ, Shan PY, Lu M, Wang T, Li RH, Zhang N, Ma L.	The role of repetitive transcranial magnetic stimulation (rTMS) in the treatment of cognitive impairment in patients with Alzheimer's disease: A systematic review and meta-analysis	J Neurol Sci. 2019 Mar 15;398:184-191. doi: 10.1016/j.jns.2019.01.038. Epub 2019 Jan 24.
68	Dong X, Yan L, Huang L, Guan X, Dong C, Tao H, Wang T, Qin X, Wan Q.	Repetitive transcranial magnetic stimulation for the treatment of Alzheimer's disease: A systematic review and meta-analysis of randomized controlled trials	PLoS One. 2018 Oct 12;13(10):e0205704. doi: 10.1371/journal.pone.0205704. eCollection 2018.
69	Zhang X, Lan X, Chen C, Ren H, Guo Y.	Effects of Repetitive Transcranial Magnetic Stimulation in Patients With Mild Cognitive Impairment: A Meta-Analysis of Randomized Controlled Trials	Front Hum Neurosci. 2021 Oct 26;15:723715. doi: 10.3389/fnhum.2021.723715. eCollection 2021.
70	Cheng CPW, Wong CSM, Lee KK, Chan APK, Yeung JWF, Chan WC.	Effects of repetitive transcranial magnetic stimulation on improvement of cognition in elderly patients with cognitive impairment: a systematic review and meta-analysis	Int J Geriatr Psychiatry. 2018 Jan;33(1):e1-e13. doi: 10.1002/gps.4726. Epub 2017 May 11.
71	Wang X, Mao Z, Yu X.	The role of noninvasive brain stimulation for behavioral and psychological symptoms of dementia: a systematic review and meta-analysis	Neurol Sci. 2020 May;41(5):1063-1074. doi: 10.1007/s10072-020-04245-4. Epub 2020 Jan 10.
72	Vacas SM, Stella F, Loureiro JC, Simões do Couto F, Oliveira-Maia AJ, Forlenza OV.	Noninvasive brain stimulation for behavioural and psychological symptoms of dementia: A systematic review and meta-analysis	Int J Geriatr Psychiatry. 2019 Sep;34(9):1336-1345. doi: 10.1002/gps.5003. Epub 2018 Oct 17.
73	Begemann MJ, Brand BA, Ćurčić-Blake B, Aleman A, Sommer IE.	Efficacy of non-invasive brain stimulation on cognitive functioning in brain disorders: a meta-analysis	Psychol Med. 2020 Nov;50(15):2465-2486. doi: 10.1017/S0033291720003670. Epub 2020 Oct 19.
74	Ilieva IP, Alexopoulos GS, Dubin MJ, Morimoto SS, Victoria LW, Gunning FM.	Age-Related Repetitive Transcranial Magnetic Stimulation Effects on Executive Function in Depression: A Systematic Review	Am J Geriatr Psychiatry. 2018 Mar;26(3):334-346. doi: 10.1016/j.jagp.2017.09.002. Epub 2017 Sep 11.
75	Lowe CJ, Manocchio F, Safati AB, Hall PA.	The effects of theta burst stimulation (TBS) targeting the prefrontal cortex on executive functioning: A systematic review and meta-analysis	Neuropsychologia. 2018 Mar;111:344-359. doi: 10.1016/j.neuropsychologia.2018.02.004. Epub 2018 Feb 10.
76	Pabst A, Proksch S, Médé B, Comstock DC, Ross JM, Balasubramaniam R.	A systematic review and meta-analysis of the efficacy of intermittent theta burst stimulation (iTBS) on cognitive enhancement	Neurosci Biobehav Rev. 2022 Apr;135:104587. doi: 10.1016/j.neubiorev.2022.104587. Epub 2022 Feb 22.
77	Sun N, He Y, Wang Z, Zou W, Liu X.	The effect of repetitive transcranial magnetic stimulation for insomnia: a systematic review and meta-analysis	Sleep Med. 2021 Jan;77:226-237. doi: 10.1016/j.sleep.2020.05.020. Epub 2020 May 22.
78	Jiang B, He D, Guo Z, Mu Q, Zhang L.	Efficacy and placebo response of repetitive transcranial magnetic stimulation for primary insomnia	Sleep Med. 2019 Nov;63:9-13. doi: 10.1016/j.sleep.2019.05.008. Epub 2019 May 27.
79	Ma H, Lin J, He J, Lo DHT, Tsang HWH.	Effectiveness of TES and rTMS for the Treatment of Insomnia: Meta-Analysis and Meta-Regression of Randomized Sham-Controlled Trials	Front Psychiatry. 2021 Oct 22;12:744475. doi: 10.3389/fpsyt.2021.744475. eCollection 2021.
80	Cheng YC, Zeng BY, Hung CM, Su KP, Wu YC, Tu YK,	Effectiveness and acceptability of noninvasive brain and nerve stimulation techniques for migraine prophylaxis: a	J Headache Pain. 2022 Feb 20;23(1):28. doi:

	Lin PY, Stubbs B, Carvalho AF, Liang CS, Chen TY, Hsu CW, Brunoni AR, Suen MW, Shiue YL, Tseng PT, Wu MK, Li CT.	network meta-analysis of randomized controlled trials	10.1186/s10194-022-01401-3.
81	Moisset X, Pereira B, Ciampi de Andrade D, Fontaine D, Lantéri-Minet M, Mawet J.	Neuromodulation techniques for acute and preventive migraine treatment: a systematic review and meta-analysis of randomized controlled trials	J Headache Pain. 2020 Dec 10;21(1):142. doi: 10.1186/s10194-020-01204-4.
82	Feng Y, Zhang B, Zhang J, Yin Y.	Effects of Non-invasive Brain Stimulation on Headache Intensity and Frequency of Headache Attacks in Patients With Migraine: A Systematic Review and Meta-Analysis	Headache. 2019 Oct;59(9):1436-1447. doi: 10.1111/head.13645. Epub 2019 Sep 18.
83	Toh EYJ, Ng JSP, McIntyre RS, Tran BX, Ho RC, Ho CSH, Tam WWS.	Repetitive Transcranial Magnetic Stimulation for Fibromyalgia: An Updated Systematic Review and Meta-Analysis	Psychosom Med. 2022 May 1;84(4):400-409. doi: 10.1097/PSY.0000000000001062. Epub 2022 Jan 28.
84	Choo YJ, Kwak SG, Chang MC.	Effectiveness of Repetitive Transcranial Magnetic Stimulation on Managing Fibromyalgia: A Systematic Meta-Analysis	Pain Med. 2022 Jul 1;23(7):1272-1282. doi: 10.1093/pm/pnab354.
85	Sun P, Fang L, Zhang J, Liu Y, Wang G, Qi R.	Repetitive Transcranial Magnetic Stimulation for Patients with Fibromyalgia: A Systematic Review with Meta-Analysis	Pain Med. 2022 Mar 2;23(3):499-514. doi: 10.1093/pm/pnab276.
86	Cardenas-Rojas A, Pacheco-Barrios K, Giannoni-Luza S, Rivera-Torrejon O, Fregni F.	Noninvasive brain stimulation combined with exercise in chronic pain: a systematic review and meta-analysis	Expert Rev Neurother. 2020 Apr;20(4):401-412. doi: 10.1080/14737175.2020.1738927. Epub 2020 Mar 14.
87	O'Connell NE, Marston L, Spencer S, DeSouza LH, Wand BM.	Non-invasive brain stimulation techniques for chronic pain	Cochrane Database Syst Rev. 2018 Apr 13;4(4):CD008208. doi: 10.1002/14651858.CD008208.pub5.
88	Yin L, Chen X, Lu X, An Y, Zhang T, Yan J.	An updated meta-analysis: repetitive transcranial magnetic stimulation for treating tinnitus	J Int Med Res. 2021 Mar;49(3):300060521999549. doi: 10.1177/0300060521999549.
89	Lefebvre-Demers M, Doyon N, Fecteau S.	Non-invasive neuromodulation for tinnitus: A meta-analysis and modeling studies	Brain Stimul. 2021 Jan-Feb;14(1):113-128. doi: 10.1016/j.brs.2020.11.014. Epub 2020 Dec 1.
90	Liang Z, Yang H, Cheng G, Huang L, Zhang T, Jia H.	Repetitive transcranial magnetic stimulation on chronic tinnitus: a systematic review and meta-analysis	BMC Psychiatry. 2020 Nov 23;20(1):547. doi: 10.1186/s12888-020-02947-9.
91	Dong C, Chen C, Wang T, Gao C, Wang Y, Guan X, Dong X.	Low-Frequency Repetitive Transcranial Magnetic Stimulation for the Treatment of Chronic Tinnitus: A Systematic Review and Meta-Analysis of Randomized Controlled Trials	Biomed Res Int. 2020 May 2;2020:3141278. doi: 10.1155/2020/3141278. eCollection 2020.
92	Chen JJ, Zeng BS, Wu CN, Stubbs B, Carvalho AF, Brunoni AR, Su KP, Tu YK, Wu YC, Chen TY, Lin PY, Liang CS, Hsu CW, Hsu SP, Kuo HC, Chen YW, Tseng PT, Li CT.	Association of Central Noninvasive Brain Stimulation Interventions With Efficacy and Safety in Tinnitus Management: A Meta-analysis	JAMA Otolaryngol Head Neck Surg. 2020 Sep 1;146(9):801-809. doi: 10.1001/jamaoto.2020.1497.
93	Kang N, Cauraugh JH.	Does non-invasive brain stimulation reduce essential tremor? A systematic review and meta-analysis	PLoS One. 2017 Sep 28;12(9):e0185462. doi: 10.1371/journal.pone.0185462. eCollection 2017.
94	Yang CC, Mauer L, Völlm B, Khalifa N.	The Effects of Non-invasive Brain Stimulation on Impulsivity in People with Mental Disorders: a Systematic Review and Explanatory Meta-Analysis	Neuropsychol Rev. 2020 Dec;30(4):499-520. doi: 10.1007/s11065-020-09456-2. Epub 2020 Oct 3.
95	Lisoni J, Barlati S, Deste G, Ceraso A, Nibbio G, Baldacci G, Vita A.	Efficacy and tolerability of Brain Stimulation interventions in Borderline Personality Disorder: state of the art and future perspectives - A systematic review.	Prog Neuropsychopharmacol Biol Psychiatry. 2022 Jun 8;116:110537. doi: 10.1016/j.pnpbp.2022.110537.
96	Yang CC, Khalifa N, Völlm B.	The effects of repetitive transcranial magnetic stimulation on empathy: a systematic review and meta-analysis	Psychol Med. 2018 Apr;48(5):737-750. doi: 10.1017/S003329171700232X. Epub 2017 Aug 22.

| 97 | De Risio L, Borgi M, Pettorruso M, Miuli A, Ottomana AM, Sociali A, Martinotti G, Nicolò G, Macrì S, di Giannantonio M, Zoratto F. | Recovering from depression with repetitive transcranial magnetic stimulation (rTMS): a systematic review and meta-analysis of preclinical studies | Transl Psychiatry. 2020 Nov 10;10(1):393. doi: 10.1038/s41398-020-01055-2. |

Title Page

Clinical Practice Guidelines for the use of Transcranial Direct Current Stimulation in Psychiatry

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Clinical Practice Guidelines for the use of Transcranial Direct Current Stimulation in Psychiatry

Abstract

Transcranial direct current stimulation (tDCS), a safe and non-invasive neuromodulation technique, has re-emerged over recent years with several technical optimizations. The applications in psychiatric disorders are on the increase. Contextually, this clinical practice guideline on tDCS in psychiatry summarizes the fundamental concepts related to tDCS and standard operating procedures for clinical practice. In addition, a brief overview of the studies reporting the effects of tDCS in various psychiatric disorders is presented. Some potential options for the therapeutic application of tDCS include major depressive disorder, schizophrenia (especially auditory verbal hallucinations), craving in substance use disorders, obsessive-compulsive disorder, anxiety disorders, and mild cognitive impairment. While tDCS is in its nascent stage with a requirement for further research to ascertain rigorous evidence, some of the advantages of this technique – safety, tolerability, ease of application, portability, scalability, cost-effectiveness as well as the potential for home-based applications - makes this neuromodulation technique a promising therapeutic option in psychiatry.

Introduction

Transcranial direct current stimulation (tDCS), a safe and non-invasive neuromodulation technique, has re-emerged over recent years with several technical optimizations. Given the limits of extant therapeutic options in psychiatry, mainly because of its tolerability and safety profile, tDCS has elicited significant interest in clinical research studies in psychiatry, neurology, and several other medical specialties. These studies are also matched with cutting-edge investigative neuromodulation research using tDCS that has revealed critical insights advancing our knowledge about the brain in health and disease. In psychiatry, tDCS has been evaluated in treating major depressive disorder, schizophrenia, alcohol use disorder, obsessive-compulsive disorder, mild cognitive impairment/dementia, and several other disorders. Given its portability and cost-effectiveness, tDCS offers the option of the remotely supervised, home-based (domiciliary) application as well.

tDCS - Definition

tDCS uses the application of low intensity, direct (time-invariant) current (usually in the range of 1 - 2 milliampere [mA]). This non-invasive neuromodulation technique, if administered as per recommended standard-operating procedures, is extremely safe. The current delivery is ensured through the placement of electrodes (25 - 35 cm^2 size [i.e., 5 X 5 cm or 7 X 5 cm]) that are made of bio-conducting material (example, conductive rubber) placed on the scalp (corresponding to the underlying target brain area) leading to polarity-specific neuromodulation & adaptive neuroplasticity changes in the neural regions (figure 1).

Figure 1 – Schematic Illustration of tDCS Application
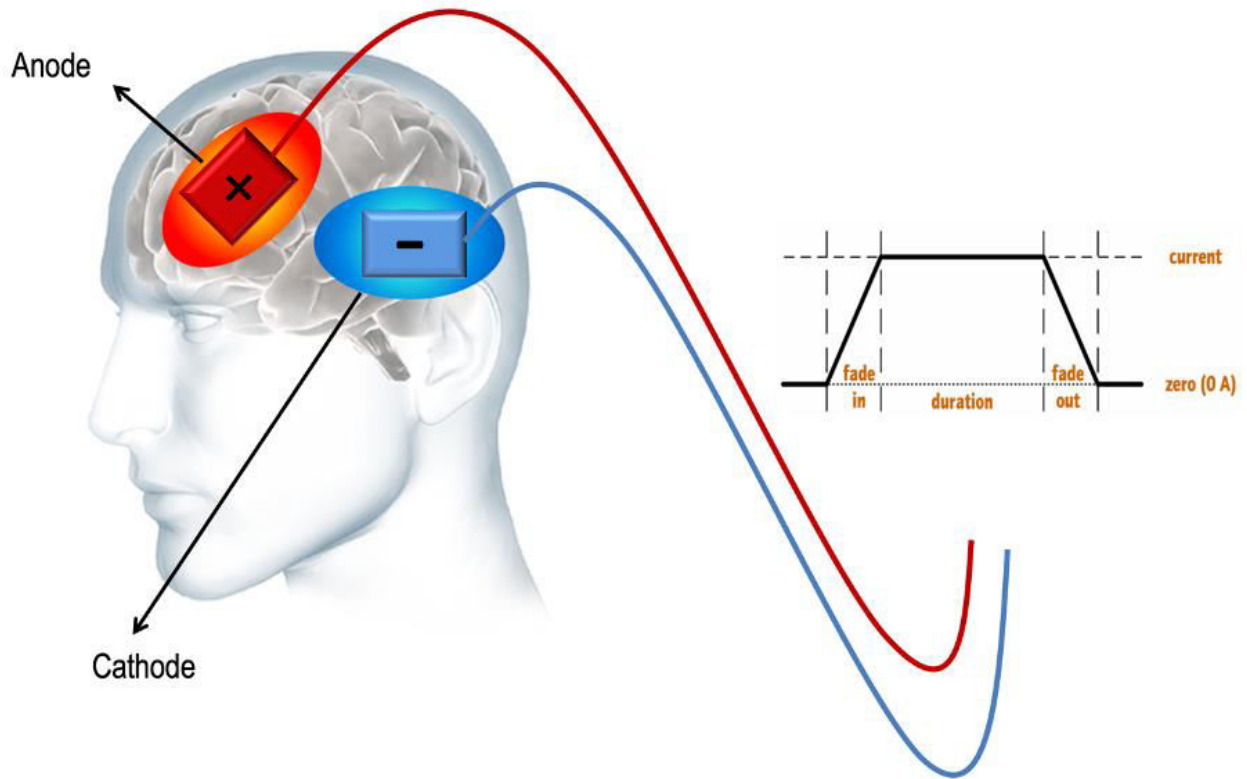
tDCS - Mechanism of Action

TThe therapeutic utility of tDCS in disorders can be best understood when both the neuroplasticity mechanisms and how tDCS modulates those mechanisms are adequately understood. Studies have noted that the observed changes on account of tDCS are secondary to the adaptive neuroplasticity of the human brain. Simply speaking, the mechanism through which tDCS can modify neuroplasticity is either by increasing or decreasing neuronal conductivity, differentially acting on the neuronal sites, modulating the local blood flow, and

brain-derived neurotrophic factor (BDNF) dependent mechanisms as well as glutamatergic, GABA-ergic / other neurotransmitter mediated effects.

Alteration of the neuronal resting membrane potential by varying the cation permeability is postulated to be one of the mechanisms through which tDCS is claimed to act. When a strong depolarizing signal is applied, it leads to more than the usual influx of Calcium ions pre-synaptically. A more significant influx of calcium ions results in a greater release of glutamate post-synaptically, which subsequently causes extensive NMDA receptor activation. This cascade eventually causes an increased calcium influx post-synaptically, activating protein kinases responsible for phosphorylation of AMPA receptors. Phosphorylation of AMPA receptors further activates more AMPA receptors resulting in further cation permeability in the postsynaptic neuron and better synaptic conductivity. The effects of tDCS on neuroplasticity can be summarized as follows: tDCS causes an increase in synaptic conductivity, both immediate and long-term. The polarity of the tDCS plays a vital role in determining the local effects of the procedure, both at the regional and neuronal levels. tDCS has been shown to induce long-lasting synaptic potentiation via augmented BDNF secretion. The long-term effects are also believed to be secondary to gene transcription secondary to tDCS. tDCS is also likely to show effects by polarity-based modulation of local blood flow. Polarity-specific effects are time-dependent, with longer than 40 minutes of stimulation session provoking compensatory mechanisms and reversal of effects.

tDCS: Device Aspects

There are several types of tDCS devices. In each one, electrodes are connected to a device capable of delivering a constant low-intensity direct current (0.5 to 3.0 mA). In conventional tDCS, two large conductive siliconized rubber electrodes (typically 7x5 cm^2), anode and cathode, complete the circuit. This administration is polarity-specific in effect, in which inhibitory

stimulation at one region is counterbalanced for an excitatory stimulation of equal intensity at another region and vice versa. With this montage arrangement, we can deliver bipolar stimulation; that is, the nature of stimulation is anodal and cathodal in effect because of the electrode type and montage configuration.

The tDCS devices delivers constant current – the intensity of current remains steady over time (e.g., 1mA or 2 mA). As per the Ohm's law, the current intensity is directly proportional to voltage and inversely related to the resistance in the circuit.

Ohm's law: Voltage = Current Intensity x Resistance [V = I * R]

Living biological tissue reacts to electric current in a way of adaptation along with the flow of tissue fluids and alters the resistance that is being offered in the circuit. Hence, effective resistance in the circuit involves biological tissue as a combination of ohmic resistance and reactance. This effective resistance is called Impedance.

To keep the current constant, where changes in impedance happen dynamically, the device adjusts the voltage at every given time point. As a safety precaution, most medical grade devices maintain a cutoff of impedance (generally 10-15 kohms) to avoid voltage surge. When the resistance increases beyond a certain threshold or when voltage reaches its limit, the device pauses/terminates the stimulation. Resistance indicators would generally be available and display the contact conditions between electrodes and the scalp during the sessions.

tDCS: Standard Operating Procedures
Checking for contraindication to tDCS during subject recruitment

1. Choose the patients by ascertain the indication and any necessary precautions for tDCS administration (Table 1).

Table 1: tDCS indications and precautions

<u>Indications</u>	<u>Precautions</u>
1. Major depressive disorder	a. Structural head injury
2. Persistent Auditory hallucinations in schizophrenia. Possibly for positive and negative symptoms.	b. Epilepsy in patient/family
	c. Scalp injury/skin lesions
	d. Implanted medical devices
3. Craving in alcohol dependance & tobacco smoking: Relapse prevention	e. Foreign body in head/eyes
	f. Past history of adversities with tDCS/rTMS
4. Obsessive-Compulsive disorder	
5. Mild cognitive impairment and dementia	

2. Explain to the subject the tDCS procedure in detail. Use of video would assist in annihilating the apprehensions.

3. Ask the subject the following questions in the screening questions (Table 2) to enquire about the presence of factors influencing the tDCS procedure.

Table 2: Screening questions to identify potential factors influencing tDCS procedure

Sl.No	Questions	Remarks
1.	Had any adverse reaction to TMS/tDCS, if received earlier?	
2.	Had a seizure/epilepsy?	
3.	Had an unexplained loss of consciousness?	
4.	Had a stroke?	
5.	Had a serious head injury?	
6.	Had a surgery to your head?	
7.	Had any brain related, neurological illnesses?	
8.	Had any illness that may have caused brain injury	

9.	Do you suffer from frequent or severe headaches?	
10.	Do you have any metal in your head (outside the mouth) such as sharpnel, surgical clips, or fragments from welding?	
11.	Do you have any implanted medical devices such as cardiac pacemakers or medical pumps?	
12.	Are you taking any medications?	
13.	Are you pregnant?	
14.	Does anyone in your family have epilepsy?	
15.	Do you need any further explanations on tDCS/HD-tDCS or its associated risk?	

Preparation

Written informed consent has to be taken

- Information regarding presence of minimal evidence for acute short-term efficacy and absence of strong evidence for long-term clinical efficacy of tDCS in the above-mentioned indications has to be clearly stated.

- Safety of multisession tDCS in clinical patients can be reassured.

Instruction to visit for tDCS with dry, clean, non-oily scalp for tDCS session should be provided.

Patients (and care-givers) have to be informed that fasting or other lifestyle changes are not necessary for tDCS administration.

Materials and their description (see Table 3 for reference)

1. Check if you have all materials needed before starting the procedure.

2. The **tDCS device** is a battery-driven current generator capable of providing constant current stimulation to the brain with a maximum output (of ±2.5) in milli-amperes (mA) range. It operates on a rechargeable power bank.

3. **Electrodes** used for tDCS are conductive rubber electrodes. These can deliver DC of either polarity - **anode** and **cathode** depending on how they are plugged into the machine (Red wire denotes anode, and blue wire denotes cathode)

4. **Measurement tape** and **skin marker** can be used to mark the desired location on the subject's scalp. The measuring tape can be further used to ascertain adequate distance between the anode and return cathodal electrode as per the study protocol requirements (minimum 3 finger distance).

5. **A comfortable chair** is required to seat the subject in a relaxed manner throughout the preparation and administration of tDCS procedure.

6. **Tissue or paper towels** can come in handy for cleaning off either electrode due to excessive saline or cleaning the subject's scalp after administration.

Table 3: List of materials for conventional tDCS

MATERIALS
tDCS Device and related components • Battery operated tDCS device • Rubber electrodes (Minimum 2) • Specially designed sponges meant to keep the electrodes in the scalp • Rubber bands (Non-conductive) • Cable to connect the rechargeable battery (power bank) with the tDCS machine • One rechargeable battery • An adapter for recharging the power bank battery
Other Materials • Saline (9 mmol) • Conductive electrode paste (if needed to decrease impedance by effectively parting the hair) • Suction pipette and trough to keep the saline. • Cotton to clean the contact surface

- Measurement tape
- Marker (for marking measurement marks on subject's scalp)
- Comfortable chair (without exposed electrically conductive surface)
- Tissue for wiping the skin region where electrodes were placed after the session

Pre-Administration Preparations

1. Turn on the tDCS device. Ensure the device has enough power for completion of the session.

2. Visually inspect the rubber electrodes for signs of wear and tear.

3. Place the rubber electrodes in sponge casings to improve tolerability and reduce adverse events like tissue injury. Never place the electrodes directly on the scalp.

4. Apply the rubber bands for holding electrodes securely on the subject's head.

5. The placement of electrodes is described in the following sections.

Administration Procedure

1. Seat the subject comfortably in a chair.

2. Thoroughly inspect the subject's scalp for signs of skin lesions, cuts, signs of inflammation or other cutaneous abnormalities.

3. Localize the stimulation target regions on the subject's head

    1. 10-20 EEG system

    2. Using tools like BeamF3

    3. Neuro-targeting using structural with/without functional Magnetic resonance imaging

4. Mark the point on the subject's scalp that corresponds to target locations.

5. Part the hair at this marking. EEG paste can be used to keep hair parted - thick hair can cause higher impedance.

6. Switch on the device before placing the electrodes on the surface. This is to avoid sudden surge of current in the circuits that can lead to adverse effects.

7. During the electrode placement, make sure that the smooth surface of the electrode (*AND NOT THE WIRED CONNECTED ELECTRODE SURFACE*) is in contact with the scalp.

8. Sponge preparation: Add saline to the sponge (around 6 ml on either sides) to make it damp. Make sure that it is sufficiently damp and not dry to be properly conductible. It should also not be dripping with saline, which may result in shortening of circuit. Once prepared, place the electrode inside the sponge.

9. Carefully place this cathodal and anodal electrodes kept inside the sponge case on the mark for desired/marked target region a on the subject's scalp at an appropriate orientation. For example, tDCS electrodes for auditory hallucinations should be placed in a horizontal orientation with 7cm as the length for left temporoparietal junction and vertical orientation with 5 cm as the length for left dorsolateral prefrontal cortex. The wire connected to the electrode should be posteriorly directed in the attachment.

10. Ascertain the distance between the two electrodes is minimum 7 cm (3 finger distance).

11. Check for the subject's comfort level with the attached rubber bands over the electrodes (This can be ascertained by asking the patients, "Is the setup too tight?")

12. Set-up the electrical parameters including peak intensity, duration of stimulation, ramp-up and ramp-down rate/duration.

13. Initiate the treatment. Ensure the impedance is below 10kΩ - with further increase in resistance, machine will auto terminate the session. *

14. Check for any sensations and reassure the pain will reduce in a few seconds with completion of ramping up and development of tolerance.

*Note: In situations of high impedance or in case of more pain, check for the following causes:

a. Check if the electrodes are in full contact with the scalp. Make appropriate changes to establish better contact.

b. Check if the saline is too less. Add saline, as required.

c. Check if the saline is too much and current is being shunted. Use tissue to remove the extra dripping saline.

d. Check if the hair parting is not proper. Remove the electrodes entirely, part the hair, apply EEG paste and then re-attach the electrodes. In most circumstances the above steps will resolve the impedance issues.

15. After the session is over, remove the electrodes. Switch of the machine only after the electrodes are removed.

16. Electrodes need to be removed from the sponge pads. Wipe the electrodes with the tissue (since dry saline over the electrodes can damage them and decrease its shelf life.)

17. Clean the sponges with running water and allow them to dry before the next session.

After the tDCS procedure

1. Carefully inspect the skin regions where electrodes were placed for signs of skin irritation and/or skin damage. Any skin deterioration should be addressed in a medically appropriate way.

2. Document the session specific details in the session record sheet.

3. Enquire from the subject about any possible side-effect and fill in the details in the side-effect record sheet after every session.

4. Inform the subject and their relative (or care-giver) about the timings of next session and brief them if there were any major issues during or from the session (like appearance of skin lesion after the session, repeated sudden cessations throughout the session,

difficulty in initiating stimulation due to abnormally high impedance, persistent moderate to severe side-effect, etc.)

5. Check the power status. If required, charge the device.

Precautions

1. Make sure that the subject takes regular head-bath, refrains from oiling hair/scalp and has a clean scalp when he/she comes for tDCS session.

2. Carefully inspect skin regions where electrodes are placed before and after every session.

3. The subject should be relaxed, comfortable and awake throughout the tDCS procedure.

4. Uncontrolled interference with on-going cortical activity during tDCS session should be avoided. Intensive cognitive effort or doing unnecessary motor activities should be avoided during the session.

5. Do not turn on the tDCS device before setting up or the electrodes for safety reasons. In a similar vein, the device should be switched off after the administrators have unmounted the electrode set-up, following completion of the stimulation.

6. Before starting the stimulation make sure that the electrodes wires are uncoiled or untangled where they connect to the machine. Coiled wires may interfere with and increase the overall resistance in the circuit.

Monitoring of adverse effects due to tDCS

tDCS is a safe well tolerated intervention, if applied using the standard procedures and protocols. The safety report is based on the stimulation parameters that are commonly examined in the patients. The adverse events are assessed using a checklist/questionnaire which evaluates the severity as well as grade of attribution of these adverse effects to the tDCS (Table 4).

Table 4: tDCS adverse effect questionnaire

Sl.No	Adverse effect	Severity	Related to tDCS
1	Headache		
2	Neck Pain		
3	Scalp Pain		
4	Tingling		
5	Itching		
6	Burning sensation		
7	Skin redness		
8	Sleepiness		
9	Trouble concentrating		
10	Acute mood changes		
11	Skin lesion		
12	Disturbed visual perception		
13	Discomfort (during tDCS)		
14	Dizziness		
15	Pressure		
16	Flashes (Phosphenes): during initiation	(Yes=1/No=0)	
17	Flashes (Phosphenes): during termination	(Yes=1/No=0)	
18	Other (Please specify)		

Severity: 1-Absent, 2-Mild, 3-Moderate, 4-Severe
Related to tDCS: 1-No, 2-Remote, 3-Possible, 4-Probable, 5-Definite

Application of tDCS in Psychiatry Disorders

Schizophrenia

Schizophrenia is a debilitating, chronic neuropsychiatric disorder, which also is a leading cause
of disability burden. The symptom components of schizophrenia involve delusions,
hallucinations, significant cognitive & motivational impairments. Despite treatment with best of

the available antipsychotic medications, about 30% of schizophrenia patients show partial or no clinical improvement and they persist to have symptoms. Significantly, treatment resistance contributes to about 80% of total health care cost burden due to schizophrenia. Contextually, alternative paradigms that involve non-invasive brain stimulation techniques attract increasing application in treating resistant symptoms in schizophrenia patients. Among several neuromodulatory techniques, tDCS has been gaining an increasing evidence base to support its clinical utility in treatment-resistant schizophrenia.

The tDCS protocols in schizophrenia have been informed by neuroimaging studies that demonstrated association between left temporoparietal region hyperactivity and auditory hallucinations as well as relationship between hypofrontality and the pathogenesis of negative symptoms. The commonly used tDCS electrode montage applies cathodal tDCS over the left temporoparietal junction and anodal stimulation over the left prefrontal cortex to target auditory hallucinations and negative symptoms respectively.

A pioneering study that applied a randomized, double-blind sham-controlled design on tDCS for treatment-resistant auditory hallucinations in schizophrenia demonstrated a 30% improvement in hallucination scores which persisted for about 3 months. Comparable effects were reported in a couple of open-labeled studies and multiple case reports. Beyond the ameliorative effects on auditory verbal hallucinations, clinical research studies have described evidence to support beneficial effects of tDCS on negative symptoms, other general symptoms related to psychopathology as well as illness awareness.

Major Depressive Disorder

Major Depressive Disorder (MDD), the leading cause of disability burden, is a health care challenge. The myriad dimensions of symptoms, coexistent psychiatric and other medical

morbidities further add to the complexity towards management. The recalcitrant symptoms in MDD warrants newer treatment modalities and tDCS is increasingly seen as a useful avenue.

A key dysfunctional brain region in MDD is the prefrontal cortex – especially the dorsolateral region – of the left side (DLPFC); hypoactive left DLPFC and hyperfunctional right DLPFC is postulated as one of the contributory components to MDD. This offers a suitable opportunity to apply anodal current to enhance the hypoactive left DLPFC and cathodal current to optimize the right DLPFC.

MDD is perhaps the most extensively examined psychiatric disorder with treatment studies using tDCS. Summary evidence from these large number of studies suggest better efficacy of tDCS for first-episode / early course MDD and lesser benefits in treatment-resistant depression. Increasingly, evidence supports sustained effects of tDCS in MDD beyond the intervention period. Interestingly, studies have supported the feasibility of home-based application as well. Other special situations that warrant the consideration of tDCS in MDD include pregnancy (especially the first trimester), multiple medical co-morbidities with serious risk even in the context of minor side-effects / drug interactions that render stiff challenges to psychopharmacological approaches.

Obsessive-Compulsive disorder

Obsessive-compulsive disorder (OCD), with a lifetime prevalence of 1-3%, is among the leading causes of neuropsychiatric disability. Animal models and human neuroimaging studies implicate a dysfunction in the parallel and partially segregated cortico-striato-thalamo-cortical (CSTC) circuits as well as the fronto-limbic circuits in the pathogenesis of OCD. These circuits modulate various cognitive, affective and motivational

processes, which are affected in patients with OCD. Recent studies also suggest cerebellar involvement in pathogenesis. Although selective serotonin reuptake inhibitors (SSRI) and cognitive-behavior therapy (CBT) are the first line treatments for OCD, a sizable proportion of patients do not respond adequately to these interventions. Invasive and non-invasive neuromodulatory interventions have been attempted to modulate the above circuits in patients with treatment resistant illness, usually as an augmentation strategy.

Functional imaging studies have shown hyper as well as hypoactivity in various cortical regions and cerebellum, which are potential targets of non-invasive neuromodulatory interventions such as tDCS. However, it is unclear whether the dysfunction is primarily related to the pathogenesis or is compensatory. Hence, both anodal and cathodal tDCS have been attempted, with mixed results. Among the various protocols, RCTs have shown significant improvement with active tDCS protocols targeting the supplementary motor area/pre-supplementary motor area (SMA/pre-SMA) and the right cerebellum as compared to sham stimulation. Although the SMA/pre-SMA target has been studied by independent groups showing positive results, studies have employed varied targeting strategies, stimulating either on the left side or bilaterally. Anodal as well as cathodal tDCS over the SMA have shown encouraging results in sham-controlled studies. A crossover study showed superior response to cathodal compared to anodal stimulation. A recent evidence-based guideline recommended anodal tDCS with Level-C recommendation. Thus, there is a need for larger studies to compare the efficacy of cathodal vs anodal tDCS targeting SMA/pre-SMA. Anodal tDCS over cerebellum with

cathodal stimulation over left orbitofrontal cortex has also been shown to be helpful in two independent RCTs. Sham-controlled trials employing anodal tDCS over left DLPFC have shown inconsistent results, although the studies employed varied methodology s. Protocols targeting the orbitofrontal cortex have not been evaluated in sham-controlled studies. There is also preliminary evidence for augmentation of CBT with anodal tDCS over medial prefrontal cortex (mPFC) (Adams et al 2021). Overall, systematic evidence exists for protocols employing anodal or cathodal stimulation of SMA/pre-SMA and anodal stimulation of the right cerebellum. Larger studies are required to confirm these findings as well as to evaluate the diverse targeting strategies and stimulation protocols.

Tourette syndrome

Tourette syndrome is a childhood-onset neuropsychiatric condition characterized by motor and vocal tics. The disorder wanes off during adolescence in most individuals, although dysfunctional tics persist in a subset of patients. Cathodal tDCS targeting the supplementary motor area has been employed as an augmentation strategy in pharmacotherapy resistant Tourette syndrome. However, the available evidence is preliminary in the form of case reports/series or single-session treatment. Given the preliminary evidence for low frequency rTMS over the same region in Tourette syndrome, cathodal tDCS may be a promising protocol that requires evaluation in larger systematic studies. At present, the evidence is preliminary at best.

Anxiety disorders

Anxiety disorders are among the most common and disabling psychiatric disorders. CBT and SSRIs are the first line treatments. Mesocortico-limbic pathways involving the

DLFPC, anterior cingulate cortex (ACC), amygdala, and hippocampus are implicated in the pathogenesis. Emotional regulation, fear processing and extinction are neuropsychological functions that may be deranged in these disorders. Non-invasive neurostimulation of cortical regions modulating these functions including dorsolateral prefrontal cortex (emotional regulation) and ventromedial prefrontal cortex (fear extinction) may thus be helpful. tDCS over these regions has been attempted as a standalone treatment or as an augmenter for CBT/other psychological interventions. Similar to depression, anodal stimulation of left DLPFC and/or cathodal stimulation of right DLPFC are the commonly employed protocols, while mPFC anodal stimulation is sometimes used for augmenting fear extinction in exposure therapies. Preliminary evidence from single studies on individual disorders have shown some encouraging results, although some studies have not shown benefit. In the absence of additional data, tDCS may currently be recommended only as experimental treatments for these conditions.

Substance use disorders

Substance use disorders are a group of highly prevalent chronic relapsing conditions, characterized by craving or irresistible urges to take particular substances, emergence of physical as well as negative emotional affective state in the absence of the substance and inability to cut down on the use. The above manifestation is modulated by distinct neuronal pathways -reward/incentive salience (basal ganglia), negative emotional (extended amygdala/habenula) and craving/executive function pathway (prefrontal cortex/insular), respectively. Although standard pharmacological and psychological interventions are effective, they have their limitations in terms of acute and long-term

efficacy. tDCS has been employed to boost the outcomes, sometimes combined with other psychological interventions. The executive function pathway involving prefrontal cortex is particularly amenable to non-invasive stimulation and has been the target in many tDCS studies.

For alcohol use disorders, a protocol involving anodal tDCS of right DLPFC and cathodal tDCS of left DLPFC has shown the most consistent results in sham-controlled trials. This protocol has been found to reduce craving, long-term relapse and improve network efficiency/inter-regional connectivity in the brain. The abstinence efficacy of the above protocol can be augmented employing alcohol-specific inhibitory control training. It is to be noted that the above protocol is reverse of that used in depression, where anodal tDCS of left DLPFC is combined with cathodal stimulation of right DLPFC. The "depression protocol" has not been found to be helpful in sham-controlled clinical trials in alcohol use disorders when combined with bias modification. Anodal tDCS of the right inferior frontal gyrus has not been found to be helpful in mindfulness-based relapse prevention. Thus, the most promising tDCS protocol for alcohol use disorders involves anodal stimulation of right DLPFC and cathodal stimulation of left DLPFC.

For tobacco smoking, recent network meta-analyses have shown significant effect of bifrontal tDCS as compared to sham stimulation. Meta-analyses and individual RCTs have shown more consistent efficacy on craving and smoking with right DLPFC anodal tDCS and left DLPFC cathodal tDCS. Studies employing the reverse protocol i.e. left DLPFC anodal and right DLPFC cathodal stimulation have yielded inconsistent results.

There is also preliminary evidence that bilateral cathodal stimulation of fronto-parietal cortices might decrease smoking consumption. Overall, the best available evidence is for anodal stimulation of right DLPFC and cathodal stimulation of left DLPFC for smoking cessation, which is similar to the protocol for alcohol dependance. A similar protocol has been used for cocaine and methamphetamine use, which have shown inconsistent results. Larger studies are warranted to evaluate the efficacy of tDCS in these conditions.

Dementia / Mild Cognitive Impairment

Cognitive disorders in the elderly are yet another condition in which tDCS studies have been conducted. These studies have shown mixed results. However, there is emerging evidence for anodal stimulation of left DLPFC to be beneficial. Moreover, given the safety and tolerability of tDCS as well as other challenges in the elderly population in the context of medical comorbidities, potential for poor tolerability of psychotropics, tDCS is an attractive option.

<u>Child and adolescent conditions</u>

tDCS is evaluated in ADHD and autism as well as in learning disorders. But the site of stimulation and protocol is varied and hence the evidence base is minimal. Larger studies are warranted to evaluate the efficacy of tDCS in these conditions. Also, the long-term consequences of modulation of the evolving brain are not known. Hence, application of tDCS in this population is experimental and with a word of caution.

Evidence based Recommendations

Available evidence for tDCS in most of the disorders (in table 5) are as add-on treatment to ongoing pharmacotherapy or psychotherapy.

Multi-session therapy is needed for longer lasting clinical effects.

tDCS may have role in certain situations like:

- Patients' preference for non-pharmacological agents

- Non-feasibility of first/second line treatments such as geriatric depression with high-risk for medications related side-effects and where psychotherapy is unavailable.

- Augmentation for faster response

Theoretically, there is an absence of risk of tDCS during pregnancy but needs to be ascertained in clinical trials.

tDCS is mostly evaluated in treatment resistant or treatment persistent symptoms and not in treatment-naïve patients.

Evidence related to safety and utility of domiciliary tDCS and continuation/ maintenance tDCS are minimal (non-replicated RCT)

tDCS is being evaluated to enhance cognition across disorders with some evidence.

Addition of cognitive activity/training to tDCS has not shown additive clinical benefits and may be adversarial.

Therapeutic role of advanced transcranial stimulation like high-definition tDCS, neurotargeted stimulation and other forms of electrical stimulations like transcranial alternating current stimulation, transcranial oscillatory current stimulation, transcranial pulsed current stimulation, transcutaneous cranial nerve stimulations is yet unclear due to absence of evidence (no RCTs) or presence of very low levels of evidence (non-replicated RCT of smaller sample sizes).

Table 5: tDCS Protocols for Psychiatric disorders with promising evidence from RCTs

Diagnosis	Anode	Cathode	Duration	Sessions
Schizophrenia	Left DLPFC	Left TPJ	20 minutes	2 per day x 5 days
OCD*	Pre SMA	Right Supraorbital	20 minutes	2 per day x 5 days
Craving (Substance-use disorder)	Right DLPFC	Left DLPFC	20 minutes	1 per day x 5 days
Depression	Left DLPFC	Right DLPFC	30 minutes	1 per day x 10 days^
Dementia / MCI	Left DLPFC	Right Supraorbital	20 minutes	1 per day x 5 days

* In OCD three types of montages: SMA/Pre-SMA Anode, SMA/Pre-SMA cathode and right cerebellar anode are found to be effective.
^20-30 days of stimulation are attempted in a few large RCT.
$In dementia one RCT has used 10 days daily sessions every month for 8 months.
OCD: Obsessive compulsive disorder; SUD: Substance Use Disorder; DLPFC: Dorsolateral prefrontal cortex; SMA: Supplementary Motor Area; TPJ: Temporoparietal junction; MCI: Mild cognitive impairment.

Psychiatric conditions with absent/inconclusive evidence from RCTs:

1. Neurodevelopmental disorders like ADHD and autism

2. Generalized anxiety disorder

3. Tourette's syndrome

4. Substance use disorders: acute intoxication, increase motivation, relapse prevention (except for alcohol and smoking)

<u>**Summary & Conclusions**</u>

Transcranial direct current stimulation (tDCS), a safe and non-invasive neuromodulation technique has re-emerged over the recent years with several technical optimizations. The applications in psychiatric disorders are on increase. Contextually, this clinical practice guidelines on tDCS in psychiatry summarizes the fundamental concepts related to tDCS, standard operating procedures for clinical practice. In addition, a brief overview of the studies reporting effects of tDCS in various psychiatric disorders is presented. Some of the potential options for the therapeutic application of tDCS include major depressive disorder, schizophrenia (especially auditory verbal hallucinations), craving in substance use disorders, obsessive-compulsive disorder, and mild cognitive impairment. While tDCS is in its nascent stage with requirement for further research to ascertain rigorous evidence, some of the advantages of this technique – safety, tolerability, ease of administration, portability, scalability, cost-effectiveness as well as potential for home-based applications - makes this neuromodulation technique a promising therapeutic option in psychiatry.

Select References

1. Antal A, Alekseichuk I, Bikson M, Brockmöller J, Brunoni AR, Chen R, Cohen LG, Dowthwaite G, Ellrich J, Flöel A, Fregni F, George MS, Hamilton R, Haueisen J, Herrmann CS, Hummel FC, Lefaucheur JP, Liebetanz D, Loo CK, McCaig CD, Miniussi C, Miranda PC, Moliadze V, Nitsche MA, Nowak R, Padberg F, Pascual-Leone A, Poppendieck W, Priori A, Rossi S, Rossini PM, Rothwell J, Rueger MA, Ruffini G, Schellhorn K, Siebner HR, Ugawa Y, Wexler A, Ziemann U, Hallett M, Paulus W. Low intensity transcranial electric stimulation: Safety, ethical, legal regulatory and application guidelines. Clin Neurophysiol. 2017 Sep;128(9):1774-1809. doi: 10.1016/j.clinph.2017.06.001. Epub 2017 Jun 19. PMID: 28709880; PMCID: PMC5985830.

2. Brunelin J, Mondino M, Gassab L, Haesebaert F, Gaha L, Suaud-Chagny MF, Saoud M, Mechri A, Poulet E. Examining transcranial direct-current stimulation (tDCS) as a treatment for hallucinations in schizophrenia. Am J Psychiatry. 2012 Jul;169(7):719-24. doi: 10.1176/appi.ajp.2012.11071091. Erratum in: Am J Psychiatry. 2012 Dec 1;169(12):1321. PMID: 22581236.

3. Brunoni AR, Amadera J, Berbel B, Volz MS, Rizzerio BG, Fregni F. A systematic review on reporting and assessment of adverse effects associated with transcranial direct current stimulation. Int J Neuropsychopharmacol. 2011 Sep;14(8):1133-45. doi: 10.1017/S1461145710001690. Epub 2011 Feb 15. PMID: 21320389.

4. Chhabra H, Bose A, Shivakumar V, Agarwal SM, Sreeraj VS, Shenoy S, Hazari N, Dinakaran D, Parlikar R, Koparde V, Ramesh V, Biswal J, Murugaraja V, Gowda SM, Chand PK, Sivakumar PT, Kalmady SV, Narayanaswamy JC, Murthy P, Girimaji SC, Venkatasubramanian G. Tolerance of transcranial direct current stimulation in psychiatric disorders: An analysis of 2000+ sessions. Psychiatry Res. 2020 Feb;284:112744. doi: 10.1016/j.psychres.2020.112744. Epub 2020 Jan 2. PMID: 31955053.

5. DaSilva, A. F., Volz, M. S., Bikson, M., Fregni, F. Electrode Positioning and Montage in Transcranial Direct Current Stimulation. *J. Vis. Exp.* (51), e2744, doi:10.3791/2744 (2011).

6. Fregni F, El-Hagrassy MM, Pacheco-Barrios K, Carvalho S, Leite J, Simis M, Brunelin J, Nakamura-Palacios EM, Marangolo P, Venkatasubramanian G, San-Juan D, Caumo W, Bikson M, Brunoni AR; Neuromodulation Center Working Group. Evidence-Based Guidelines and Secondary Meta-Analysis for the Use of Transcranial Direct Current Stimulation in Neurological and Psychiatric Disorders. Int J Neuropsychopharmacol. 2021 Apr 21;24(4):256-313. doi: 10.1093/ijnp/pyaa051. PMID: 32710772; PMCID: PMC8059493.

7. Fregni F, Nitsche MA, Loo CK, Brunoni AR, Marangolo P, Leite J, Carvalho S, Bolognini N, Caumo W, Paik NJ, Simis M, Ueda K, Ekhitari H, Luu P, Tucker DM, Tyler WJ, Brunelin J, Datta A, Juan CH, Venkatasubramanian G, Boggio PS, Bikson M. Regulatory Considerations for the Clinical and Research Use of Transcranial Direct Current Stimulation (tDCS): review and recommendations from an expert panel. Clin Res RegulAff. 2015 Mar 1;32(1):22-35. doi: 10.3109/10601333.2015.980944. PMID: 25983531; PMCID: PMC4431691.

8. Mondino M, Brunelin J, Palm U, Brunoni AR, Poulet E, Fecteau S. Transcranial Direct Current Stimulation for the Treatment of Refractory Symptoms of Schizophrenia. Current Evidence and Future Directions. Curr Pharm Des. 2015;21(23):3373-83. doi: 10.2174/1381612821666150619093648. PMID: 26088110.

9. Razza LB, De Smet S, Moffa A, Sudbrack-Oliveira P, Vanderhasselt MA, Brunoni AR. Follow-up effects of transcranial direct current stimulation (tDCS) for the major depressive episode: A systematic review and meta-analysis. Psychiatry Res. 2021 Aug;302:114024. doi: 10.1016/j.psychres.2021.114024. Epub 2021 May 21. PMID: 34058716.

10. Thair H, Holloway AL, Newport R, Smith AD. Transcranial Direct Current Stimulation (tDCS): A Beginner's Guide for Design and Implementation. Front Neurosci. 2017 Nov 22;11:641. doi: 10.3389/fnins.2017.00641. PMID: 29213226; PMCID: PMC5702643.

11. Woodham R, Rimmer RM, Mutz J, Fu CHY. Is tDCS a potential first line treatment for major depression? Int Rev Psychiatry. 2021 May;33(3):250-265. doi: 10.1080/09540261.2021.1879030. Epub 2021 Mar 11. PMID: 33706656.

12. Woods AJ, Antal A, Bikson M, Boggio PS, Brunoni AR, Celnik P, Cohen LG, Fregni F, Herrmann CS, Kappenman ES, Knotkova H, Liebetanz D, Miniussi C, Miranda PC, Paulus W, Priori A, Reato D, Stagg C, Wenderoth N, Nitsche MA. A technical guide to tDCS, and related non-invasive brain stimulation tools. Clin Neurophysiol. 2016 Feb;127(2):1031-1048. doi: 10.1016/j.clinph.2015.11.012. Epub 2015 Nov 22. PMID: 26652115; PMCID: PMC4747791.

13. Antal A, Luber B, Brem AK, Bikson M, Brunoni AR, Cohen Kadosh R, Dubljević V, Fecteau S, Ferreri F, Flöel A, Hallett M, Hamilton RH, Herrmann CS, Lavidor M, Loo C, Lustenberger C, Machado S, Miniussi C, Moliadze V, Nitsche MA, Rossi S, Rossini PM, Santarnecchi E, Seeck M, Thut G, Turi Z, Ugawa Y, Venkatasubramanian G, Wenderoth N, Wexler A, Ziemann U, Paulus W. Non-invasive brain stimulationand neuroenhancement. Clin NeurophysiolPract. 2022 May 25;7:146-165. doi: 10.1016/j.cnp.2022.05.002. PMID: 35734582; PMCID: PMC9207555.

14. Rangarajan SK, Suhas S, Reddy MSS, Sreeraj VS, Sivakumar PT, Venkatasubramanian G. Domiciliary tDCS in Geriatric Psychiatric Disorders: Opportunities and Challenges. Indian J Psychol Med. 2021 Jul;43(4):351-356. doi: 10.1177/02537176211003666. Epub 2021 Apr 27. PMID: 34385730; PMCID: PMC8327869.

15. Thamby A, Seshachala K, Sharma L, Thimmashetty VH, Balachander S, Shivakumar V, Hazari N, Chhabra H, Arumugham SS, Ts J, K M, Venkatasubramanian G, Reddy YCJ, Narayanaswamy JC. Transcranial direct current stimulation for treatment- resistant obsessive-compulsive disorder-A large case series. Asian J Psychiatr. 2021 Jun;60:102625. doi: 10.1016/j.ajp.2021.102625. Epub 2021 Apr 5. PMID: 33930710.

16. Gowda SM, Narayanaswamy JC, Hazari N, Bose A, Chhabra H, Balachander S, Bhaskarapillai B, Shivakumar V, Venkatasubramanian G, Reddy YCJ. Efficacy of pre-supplementary motor area transcranial direct current stimulation for treatment resistant obsessive compulsive disorder: A randomized, double blinded, sham-

controlled trial. Brain Stimul. 2019 Jul-Aug;12(4):922-929. doi: 10.1016/j.brs.2019.02.005. Epub 2019 Feb 13. PMID: 30808612.

17. Bose A, Shivakumar V, Agarwal SM, Kalmady SV, Shenoy S, Sreeraj VS, Narayanaswamy JC, Venkatasubramanian G. Efficacy of fronto-temporal transcranial direct current stimulation for refractory auditory verbal hallucinations in schizophrenia: A randomized, double-blind, sham-controlled study. Schizophr Res. 2018 May;195:475-480. doi: 10.1016/j.schres.2017.08.047. Epub 2017 Sep 1. PMID: 28866447.