

# INDIAN PSYCHIATRIC SOCIETY CLINICAL PRACTICE GUIDELINES ON SUBSTANCE ABUSE DISORDER IN CHILDREN AND ADOLESCENTS

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## INTRODUCTION

The 32nd president of US Franklin D. Roosevelt (1882 - 1945) in his address at University of Pennsylvania on September 20, 1940 said, “We cannot always build the future for our youth, but we can build our youth for the future”. That’s exactly what comes to mind while formulating the clinical practice guidelines for substance abuse disorder in children and adolescents. The previous guidelines were published in 2008, and so it was of paramount importance to update the scientific information that has become available during the decade since then in terms of epidemiological data, screening and assessment tools, and management practices.

India is home to the largest population of children and adolescents (aged 5-19years). According to the Census of India, 2011, adolescents (in the age group of 10-19 years) constitute one-fifth (20.91%) of the population. The ratio of female to male adolescents is skewed at 882:1000. The first nation-wide survey on children (aged 5-18 years) conducted under the auspices of National Commission for Protection of Child Rights (NCPCR) at 135 sites across 27 states and 2 union Territories provides us with significant insights into the magnitude and pattern of drug menace in this age bracket (**Table1**). Most children had used any one or more of the substances in their lifetimes with tobacco (83.2%) and alcohol (67.7%) leading the charts followed by cannabis (35.4%) and volatile solvents (34.7%), opioids (18.1%), sedative-hypnotics (7.9%), heroin (7.9%) and injectables (12.6%). The current use statistics did not lag behind much. The mean age at onset of substance use was 12.3 years with increasing age associated with increased use of illicit drugs. The prevalence of substance use takes a quantum jump in street children and urban slums (17% of Indian households). The type of substance being used varies according to geographical regions.

**Table 1. Nationwide surveys- key findings**

Study	Age group	Sample size	Key findings
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NCPCR 2013	5-18y	4024; 169 girls; 70% urban; 59% non-studying; 50% earned their own living; 20% had single parent; 22% street children	Tobacco (83.2%), alcohol (67.7%), cannabis (35.4%), inhalants (34.7%), pharmaceutical opioids (18.1%), sedatives (7.9%) and heroin/smack (7.9%), injectable substances (12.6%) Mean age of onset was lowest for tobacco=12.3y. Substances used on a daily basis- tobacco & alcohol (home) and inhalants (street) Onset of use is 1-1.5 years earlier among street children. Involvement is sexual activity: Under influence: home (18%), street (29%); In exchange for substance or money: home (17%), street (20%) 55-65% experienced tolerance or withdrawals, higher among out-of-school and street children
National Household Survey; Ray et al, 2004	12-18 y	8,587 (21.8% of total study sample)	Current prevalence: 3% for cannabis and 0.1% for opiate use
National Family Health Survey - 3rd round (NFHS-3); 2006	15-19 y	13009 boys, 24811 girls	Alcohol: 11% boys & 1% girls; 20-45% using at least weekly or daily; Tobacco use in 1/4th boys
Study on Child Abuse: India 2007; Kacker et al, 2007	< 18 years	12,447	Any substance use- 32%; first exposure by: friends 70% and parents 12%

The period of adolescence is accompanied with a transition from the dependent, family-oriented state of childhood, to the independent, peer-oriented state of young adulthood. This is accompanied by refinements in cognitive, emotional and social skills that facilitate exploratory, novelty-seeking, and sensation-seeking behaviors. While this aids in the transition to independence, it also facilitates excessive risk-taking behavior. Some of these risk-taking behaviors can be seen in the form of substance use, as adolescence is a prime time for experimentation with drugs and alcohol.

There is a large treatment gap among adolescent substance users. The reasons are variable and include socioeconomic, cultural and psycho-biological factors. For example, poor health care coverage, low motivation by the youth or parents, a lack of specialized adolescent

treatment programs, inconsistent quality in adolescent treatment services and immature developing brain (prefrontal cortex and nucleus accumbens). Even the presentation of substance use problem differs in adults and adolescents (**table 2**). Since the formative years of childhood is the time of acquiring life and social skills along with cognitive and academic development, it is an obvious fact that substance use will markedly hamper our efforts to achieve the desired goals our children in particular and of our society and nation in general. It is quite reasonable to say that adolescents will have much better prognosis if evidence-based treatment programs are designed keeping in mind these very fundamental differences and needs in mind. Therefore, it is of paramount importance for us as medical health professionals to gather ourselves and help tackle the menace of substance use disorders among children and adolescents.

**Table 2. Clinically significant differentiating characteristics of adolescent substance abusers from adult substance abusers**

<ul style="list-style-type: none"> <li>• Shorter history of substance Greater chances of occasional substance use than daily use</li> <li>• Less chances of having adverse medical consequences of protracted use</li> <li>• Experimentation with greater number or different types of substances, resulting in more complicated withdrawal features</li> </ul>	<ul style="list-style-type: none"> <li>• Quite often associated with co-occurring psychiatric comorbidity, family disruption, academic problems, behavioural problems, and peer drug use</li> <li>• Greater chances of improvement by early adulthood without formal intervention or treatment</li> <li>• Confrontation-of-denial approaches to treatment are less successful</li> </ul>
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A substance use disorder (SUD) is characterized by a continued problematic pattern of use despite negative consequences, which causes significant distress or impairment in functioning. The clinician dealing with adolescents with SUDs should develop a treatment plan that uses modalities that target

- (1) Motivation and engagement into treatment;
- (2) Family involvement to improve supervision, monitoring, and communication between parents and adolescent;
- (3) Attention to problem solving, social skills enhancement, and relapse prevention;

(4) Addressing comorbid psychiatric disorders through psychosocial and/or medication treatments;

(5) Aiming for conducive social ecology in terms of increasing prosocial behaviours, peer relationships, and academic functioning; and

(6) Adequate duration of treatment and follow-up care.

Medication can be used when indicated for the management of craving and withdrawal and for aversion therapy especially if there is a failure or unavailability of psychosocial therapies or personal preference of the client. It is also advisable that children and adolescents with SUDs should receive thorough evaluation for comorbid psychiatric disorders.

This guideline is one such stride among many in this direction. Before implementing these guidelines in toto, it should be kept in mind that the evidence regarding following issues is virtually non-existent (India in general and Indian children and adolescents in particular):

- The effectiveness of substance abuse treatment for different ethnicities and minorities
- How ethnicity and culture may moderate the treatment process and outcome
- How interventions may be modified to improve cultural congruency.

The primary goal (both in short-term and long-term) of management of SUDs in adolescents is to achieve and maintain abstinence from substance use. While trying to achieve the ultimate aim of abstinence, harm reduction may be an intermediate implicit (never explicit) goal of treatment. The concept of harm reduction has grown in significance due to the fact that SUDs are chronic in nature and all treatment efforts not always bear abstinence as fruit. This concept includes a reduction in the use and adverse effects of substances, a reduction in the severity and frequency of relapses, and improvement in one or more domains of the adolescent's functioning (e.g., academic performance or family functioning).

The treatment goal should not only include substance control but a range of rehabilitative measures too. A broad concept of rehabilitation involves targeting associated problems and domains of functioning for treatment such as coexisting psychiatric and behavioural problems, family functioning, peer and interpersonal relationships, and academic/vocational functioning. This will not only improve psychosocial functioning but will also help in achieving improved outcomes in the primary treatment goal of achieving and maintaining abstinence.

## METHODOLOGY

Review articles and various guidelines published till 2018 were searched. A thorough search in Google, Google scholar and pub med was made with search words/ phrases such as Management/treatment/intervention of substance/alcohol/tobacco/cigarette/inhalant/opioids/heroin/stimulants/benzodiazepines/use/abuse/addictions in children and/or adolescence with special emphasis for articles published after 2010.

## MANAGEMENT OF ALCOHOL USE DISORDERS

Most teenagers who use alcohol fall into the experimenter-regular user range. Such adolescents rarely come into contact with de-addiction services in the absence of some acute event (e.g., an intoxication-related accident). The types of alcohol-using teens typically seen in such settings are abusers (mostly) and very few adolescents have a long enough alcohol use history to develop alcohol dependence. Given the differences in body composition and alcohol metabolism, binge drinking needs to be defined differently in adolescents from adults. A binge refers to consumption of alcohol (in terms of standard drinks) within a period of 2 hours, that raises the blood alcohol concentration to 80mg%. Among boys aged 9 to 13 years, consumption of approximately 3 drinks is considered a binge, which increased to 4 drinks in 14 to 15 year old males, and 5 drinks in males aged 16 and above. Among girls aged 9 to 17, consumption of 3 standard drinks constitutes binge drinking. Risk categorization and identification of at-risk population helps in timely intervention. Assessing the amount of alcohol being used will further help assess the risk levels (**table3**).

**Table 3. Alcohol equivalents in types of drinks and their containers**

A standard drink* of various alcoholic beverages				
Type of alcoholic beverage (w/v)	Regular beer (5%)	Malt liquor (7%)	Table wine (12%)	80-proof distilled spirit (40%)
Equivalent amount	360 ml	240-270ml	150ml	45ml

(ml)				
Number of standard drinks in different-sized containers				
	360ml=1	360ml=1.5	150ml=1 (a glass)	45ml=1 (a shot)
	480ml=1.3	480ml=2	750ml=5 (a bottle)	750ml=17 (a fifth)
	1200ml=3.3	1200ml=4.5		1.75L=39 (a handle)
* Any drink that contains 18ml or 14g of absolute alcohol				

Thus, before embarking upon treatment paradigms for any presentation, baseline and follow-up evaluation of children and adolescent for problem use and dependence is a good practice and questionnaire and scales may be used where available (**table4**). Developmental appropriateness is a prerequisite for these instruments before applying them with adolescents. No instrument has been shown to be consistently culturally sensitive with all ethnic populations. But, at the same time, existing data fail to indicate any such need. The advantages of standardized assessments are that they:

- (1) provide a benchmark against which clinical decisions can be compared and validated;
- (2) are less prone to clinician biases and inconsistencies; and
- (3) provide a common language from which improved communication in the field can develop.

It is to be noted that the term alcohol use disorder (AUD) as has been used in this document to encompasses intermittent binge drinking, hazardous drinking and chronic alcohol abuse and dependence.

**Table 4. Assessment questionnaires, inventories, and scales**

Name	Authors	Number of items	Remarks
<b>Screening</b>			
Personalized experience inventory (PEI)	Winters et al., 1999		
CRAFFT	Knight et al., 2002	6-item	Brief screen for primary care professionals

Drug use screening inventory- adolescents (DUSI-A)	Tarter & Hegedus, 1991	159 items	Documents the level of involvement with a variety of drugs, quantifies severity of consequences associated with drug use
Problem-Oriented Screening Instrument for Teenagers (POSIT)	Gruenewald and Klitzner, 1991	139 items	Identify problems and potential need for service in 10 functional areas, including substance use and abuse
PESQ	Winters, 1992	40 items	Screens for the need for further assessment of drug use disorders
<b>Evaluation</b>			
Adolescent Diagnostic Interview (ADI)	Winters and Henley, 1993		Assesses symptoms associated with substance use disorders. Obtains diagnoses, substance use history, and psychosocial functioning
Customary Drinking and Drug Use Record (CDDR)	Brown et al., 1998		Current and lifetime measures of 4 alcohol- and other drug-related domains
Teen-Addiction Severity Index (TASI)	Kaminer et al., 1993		Provides severity ratings on multiple domains of functioning
Adolescent Problem Severity Index (APSI)	Metzger et al., 1991		Provides severity ratings on multiple domains of functioning
Comprehensive Adolescent Severity Index for Adolescents (CASI-A)	Meyers et al., 1995		Provides severity ratings on multiple domains of functioning
Problem Recognition Questionnaire (PRQ)	Cady et al., 1996	25-item self-report	Adolescents' perceptions of the seriousness of alcohol/drug involvement and motivation for drug use change and readiness for treatment
Global Appraisal of Individual Needs (GAIN)	Dennis, 1998		Documents substance use disorder and other psychiatric diagnoses; placement criteria; health, mental distress, and environment; and service use outcomes. A brief version allows for screening. An outcome version provides information about critical outcome variables
Adolescent Drinking Index (ADI)	Harrell & Wirtz, 1994	24-item	Assesses alcohol use in adolescents with psycho-emotional-behavioral problems; identifies those who need further alcohol evaluation or treatment; defines the type of

			drinking problem and can help develop treatment plans and recommendations
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## Laboratory testing

There is no lab test to identify AUD as is the case with all other SUD. But laboratory tests are required during the assessment process to confirm a diagnosis, to establish a baseline, and later, to monitor progress. They can also act as a powerful incentive for changing behaviour or motivating patients to accept referrals for treatment. Following are some of the tests used in various settings:

### (i) To detect recent alcohol intake

Breath analysis – estimates blood alcohol concentration (BAC)

Urine metabolites of alcohol (not required routinely): Ethyl succinate and Ethyl glucuronide are highly sensitive markers but chances of false positives are also there

### (ii) Biomarkers for AUD

Carbohydrate Deficit Transferrin (CDT): to screen for chronic alcohol consumption and to monitor consumption during treatment (increase in levels with increasing consumption)

Aspartate aminotransferase (AST) & gamma glutamyltransferase (GGT): higher levels indicate recent significant consumption

Erythrocyte Aldehyde Dehydrogenase (eADH)

### (iii) To identify alcohol-related damage

Complete blood counts (CBC): Alcohol causes anaemia, macrocytosis and bone marrow suppression. Mean Cell Volume (MCV) is commonly raised.

Vitamin deficiencies: Thiamine, pyridoxine, folic acid, vitamin B12 and vitamin D deficiencies are common. Levels should be tested especially if suspicion of poor nutritive status or symptoms of Wernicke-Korsakoff's syndrome.

Hepatorenal testing: To assess baseline hepatorenal functioning especially before starting pharmacotherapy and during follow-up monitoring.

Liver Function tests (LFTs)- Includes Alanine aminotransferase (ALT), aspartate aminotransferase (AST), gamma glutamyltransferase (GGT), alkaline phosphatase (APh), lactate dehydrogenase (LDH), bilirubin (BR), total protein, albumin (ALB), prothrombin time (PT),

Kidney Function Tests (KFTs)- Includes serum electrolytes, blood urea nitrogen (BUN) and creatinine (Cr)

(iv) Others

Ultrasonography: to assess hepatorenal status

Transient elastography (TE, Fibroscan): early diagnosis of alcoholic cirrhosis

Electrocardiography (ECG): especially if malnourishment and mineral deficiencies and before initiation of drug therapy

### **Treatment strategies for alcohol dependence**

Alcohol dependence is rare in children and adolescents but deaths can occur due to alcohol-related accidents and acute alcohol poisoning as there is high tendency to binge drink. The treatment/intervention plan will depend upon the stage or severity of alcohol use and severity of withdrawal symptoms. There is evidence that treatment is superior to no treatment, but there is insufficient evidence to compare the effectiveness of treatment types. Most evidence indicate efficacy of psychosocial measures with pharmacotherapy as an adjunct modality.

#### ***Pharmacological treatments***

Pharmacological treatments are required for management of withdrawal syndrome, to prevent heavy drinking and maintain abstinence. A medication-assisted treatment for AUDs has several associated benefits:

- Lengthens periods of abstinence thus increasing individual coping capacities necessary for long-term recovery
- Prevents turning a lapse into a full blown relapse
- Allows brain cells to readapt to a normal non-alcoholic state, helping patients stabilize, think more clearly, have more positive emotional responses, strengthen coping mechanisms, enhance self-esteem, and increase motivational readiness for change
- Helps in ameliorating protracted withdrawal
- Supports the effects of psychosocial treatment and sustains the gains of intervention.

#### ***Acute stage- Alcohol withdrawal syndrome (AWS)***

Mainstay: Benzodiazepines remain the cornerstone of pharmacotherapy during acute stage alcohol detoxification, withdrawal symptom management and prevention of complications such as delirium tremens and seizures. The choice of type of benzodiazepines depends upon the severity of withdrawal symptoms (**table 5; figure 1**) and status of liver function. Long-acting benzodiazepines like chlordiazepoxide and clonazepam are preferred. If liver function is compromised medium-acting benzodiazepines like oxazepam and lorazepam should be used depending on availability.

Adjunct (as and when clinically indicated): Nutritional deficiencies are seen commonly in subjects of alcohol use disorders for a variety of reasons (**table 6**) and must be addressed to improve the overall prognosis.

- Thiamine 50-100mg/d (first dose preferably intramuscular)
- Magnesium 2-4 mEq/kg i.v. on day 1, 0.5-1 mEq/kg daily on days 2-4 as clinically indicated
- Multivitamins- as and when indicated on clinical or blood examination

**Table 5. Alcohol withdrawal syndrome**

Mild	Moderate	Severe	Complicated	Pathological
lower level of consciousness, poor coordination, ataxia, nystagmus, conjunctival injection, slurred speech, stupor, GI bleed, orthostatic hypotension	restlessness, agitation, coarse tremor, higher sensitivity to sensory input, nausea, vomiting, anorexia, autonomic hyperactivity (tachycardia, hypertension, hyperthermia), anxiety/depression, headache, insomnia	Respiratory depression, coma, death. (chronic: pancreatitis, cirrhosis, are rare in adolescents)	hallucinations, delirium, death	belligerent, excited, combative, psychotic state (even after small amount in susceptible person)

**Table 6. Etiopathogenesis of nutritional deficiencies in alcoholism**

- Poor dietary intake
- Alcoholic gastritis and gastrointestinal (GI) bleeding
- Impaired digestion of nutrients into usable forms due to reduced pancreatic enzyme secretions
- Damage to GI wall cell-lining leading to reduced absorption and disabled transport of nutrients
- Reduced fat absorption resulting in concurrent reduced absorption of fat-soluble vitamins and calcium
- Reduced absorption secondary to folate deficiency causing changes in GI wall cell-lining
- Impaired utilization of absorbed nutrients due to altered transport, storage (vitamin A), or excretion (fat, magnesium )

**I. *Maintenance stage***

Psychosocial intervention is the mainstay of the maintenance treatment for alcohol dependence. Medication-assisted treatment of AUDs is consistent with treatment of other chronic disorders such as diabetes or hypertension. Long-term, perhaps indefinite, use of medication for maintenance treatment is reasonable. On a case to case basis, medication may be employed indefinitely or intermittently along with interventions that help change certain lifestyles to maintain recovery. The use of adjuvant pharmacotherapy is recommended for those with moderate to severe dependence post alcohol withdrawal. Adjuvant pharmacotherapy is also suitable for children and adolescents with mild dependence who have either not responded to initial attempts to attain abstinence or have specifically requested it. There are medications that help in prolonging the duration of abstinence, reduction of drinking days or amount of alcohol being consumed though there is dearth of good quality evidence establishing their safety and efficacy in children and adolescents.

Before initiating drug treatment, a thorough medical evaluation is a must that includes a physical exam, psychosocial assessment, and laboratory testing (including toxicological screening and LFT) to establish suitability for medication and a baseline for comparison.

While deciding for the pharmacological option, it is prudent to enquire and assess past experience with or current opinion about particular maintenance medications, level of

motivation for abstinence, medical status and contraindications for each medication, and history of medication compliance.

As a general rule, any medication should be prescribed with caution in young people (Table 7).

**Table 7. Medications used in long-term management of alcohol use disorders**

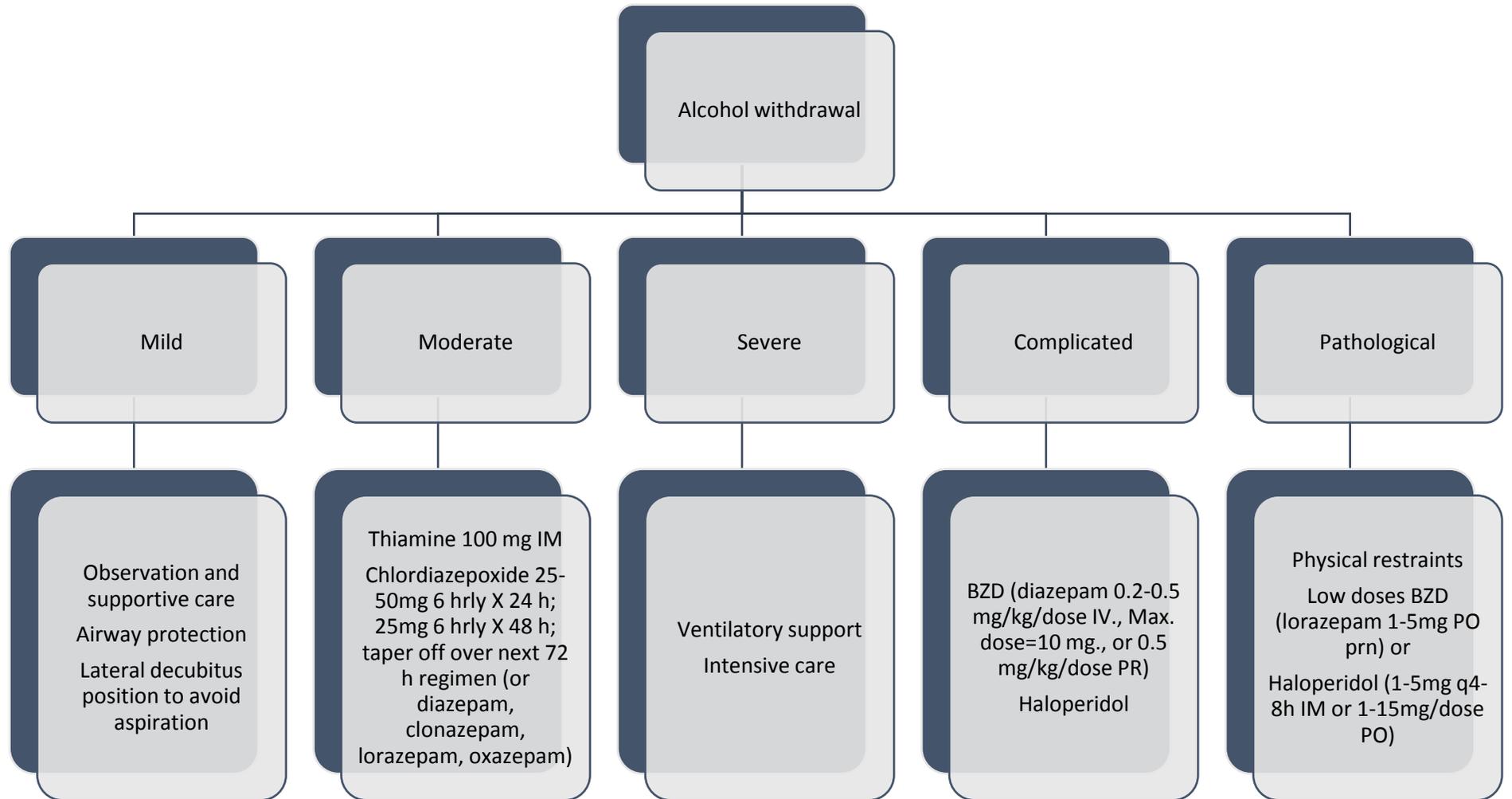
Drug	Dose (mg)	Pharmacokinetics	Adverse effects	Management of adverse effects	Significant drug interactions
Disulfiram	Initial: 250-500 mg/d, started 12-24 h of alcohol abstinence for 1-2 wk; Maintenance: 125-250mg/d	80-95% of oral dose absorbed; binds irreversibly to ALDH	Common=Drowsiness, nausea, vomiting, tiredness, halitosis, metallic taste, reduced libido, acneiform eruptions Rare= allergic dermatitis, fatal hepatitis (may occur many months later after stopping disulfiram or without pre-existing liver impairment), peripheral neuritis, optic neuritis, encephalopathy, psychosis Disulfiram Ethanol Reaction (DER): Mild-moderate= flushing, sweating, tachycardia, hypotension, chest pain, acetaldehyde breath odour, respiratory distress, blurred vision, nausea, vomiting, diarrhoea, thirst, severe throbbing headache, vertigo, syncope, confusion, weakness and marked unease	Skin: anti-histamines Psychosis: dose reduction or stop; adjust dosage of anti-psychotic drug Fatal hepatitis/ peripheral neuritis/ optic neuritis: discontinue disulfiram Mild (BAC 5 to 10 mg/100 mL):Reassurance, oral fluids Moderate (BAC 50 mg/100 mL)-severe (BAC 125 to 150 mg/100 mL): supportive measures to restore blood pressure and treat shock; administration of oxygen or carbogen (95% oxygen+5% carbon dioxide), intravenous vitamin C (1 g), ephedrine sulphate, or intravenous antihistamines, dopamine infusion If no response, then Fomepizole (4-methyl pyrazole): 15 mg/kg i.v. single dose	Avoid in patients receiving or who have recently received amprenavir, ritonavir, sertraline, metronidazole, paraldehyde, alcohol, or alcohol-containing preparations (e.g., cough syrups, tonics); also patients exposed to ethylene dibromide or its vapours (e.g., in paint, paint thinner, varnish, shellac) or using products that contain alcohol (e.g., vinegars, sauces, aftershave lotions, liniments)

			Severe= tachyarrhythmias, collapse, hepatotoxicity, myocardial infarction (in pre-existing coronary artery disease), acute congestive heart failure (if pre-existing dysfunction), respiratory depression, seizures, occasional death		
Acamprosate	333mg 2 tab TID.	Oral bioavailability 11%; renally excreted as such. Before initiation and during follow-up: Renal function tests (urea, electrolytes, and serum creatinine) to rule out severe renal impairment	Most common: diarrhoea Uncommon: intestinal cramps, headache, flatulence, increased or decreased libido, insomnia, anxiety, muscle weakness, nausea, itchiness, dizziness, Suicidal ideation (less common but serious)	Diarrhoea: Treat with loperamide or Bismuth subsalicylate. Loperamide: 6-8 y, 20-30 kg: start 2 mg PO x1, then 1 mg PO after each loose stool; Max: 4 mg/day 8-11 y, 30-40 kg: start 2 mg PO x1, then 1 mg PO after each loose stool; Max: 6 mg/day ≥12 y: start 4 mg PO x1, then 2 mg PO after each loose stool; Max: 8 mg/day Recommend appropriate dietary changes. Reduce dosage or discontinue if diarrhoea remains intolerable after treatment  Suicidal ideation: Inform patients to contact the prescribing professional immediately Monitor patients for onset or worsening of depression	Increase in serum levels of naltrexone

				Obtain a psychiatric consult and/or prescribe antidepressant medication as necessary. Discontinue acamprosate	
Naltrexone	12.5-25mg od x 1-2wk; initiated 3-7d of abstinence; maintenance dose 50mg od.	Near complete oral absorption and hepatic metabolism to active metabolite 6-β-naltrexol (t <sub>1/2</sub> = 13h)	Most common: nausea, vomiting, headache, dizziness, fatigue, anxiety, nervousness, somnolence Less common: diarrhoea, constipation, stomachache chest pain, joint/muscle pain, rash, difficulty sleeping, excessive thirst, loss of appetite, sweating, increased tears, mild depression, delayed ejaculation	Nausea: avoid empty stomach; ingest with meals rich in complex carbohydrates. Simultaneous use of table spoonful of simethicone or bismuth subsalicylate. Reduce dose or stop for 3-5d before reinitiating at lower dose	Opioid containing cough/cold/ anti-diarrhials: reduced effect Opioid analgesia requires dose escalation- risk of prolonged respiratory depression  Thioridazine: somnolence, lethargy NSAIDS: raised AST/ALT if dose of naltrexone > 100mg
			Hepatotoxicity (abdominal pains that last more than a few days, fatigue, nausea, weakness, fever, light-colored stools, dark tea-colored urine, yellowing of sclera or skin)	In healthy: LFT (i.e., ALT, AST, GGT, Bilirubin) at baseline and then at 1mth, 3mth, 6 mth and yearly thereafter More frequently if: baseline liver function test results are high, history of hepatic disease, concurrent hepatotoxic medication, naltrexone > 50 mg/day, serum aminotransferase levels > 5 times the upper limit of normal Discontinue naltrexone	
			Overdose	Symptomatic supportive care	
			Precipitated opioid withdrawal	Discontinue naltrexone, supportive care, symptomatic medications to manage withdrawal symptoms (clonidine,	

				antispasmodics, antidiarrhials)	
Nalmefene	18mg OD preferably one to two hours before alcohol intake; if has started to drink before the day's dose, then take as soon as possible	$t_{1/2}=13.4$ h; slower onset and longer duration of action than naltrexone	Most common: nausea Very common insomnia, dizziness, headache; absence of a dose-dependent association with liver toxicity	Mostly self-limiting; No dose reduction required mild or moderate hepatic impairment but severe impairment No requirement to monitor LFT	Not suitable for patients requiring opioid analgesia Interaction with inducers and inhibitors of the UGT2B7 enzyme

**Figure 1: Management of alcohol withdrawal syndrome**



**A. Deterrent/ alcohol-sensitizing drug Disulfiram (DSF):** Disulfiram (tetraethylthiuram disulfide) helps in decreasing impulsive or situational use of alcohol. It inhibits alcohol dehydrogenase (ALDH) in liver and dopamine  $\beta$ -hydroxylase in brain. The first action results in high levels of acetaldehyde that causes an unpleasant physical reaction (known as disulfiram-ethanol reaction, DER) within 15-30 min and may last for several hours or days. The severity of DER will depend upon the dose of disulfiram and blood alcohol concentration (BAC).

Its use should be restricted to highly motivated patients only, with ingestion under direct supervision and regular specialist monitoring.

In patients committed to complete abstinence it might benefit with more total days of abstinence, reduced weekly drinking, and lower levels of GGT (a marker of liver injury due to heavy alcohol use). Ensuring medication adherence with direct supervision and concomitant psychosocial therapies help improve the effectiveness of disulfiram. It can also be used when acamprosate or naltrexone are not suitable or preferred. Alcohol challenge test to demonstrate the effects of disulfiram should be avoided. Regular monitoring through clinical supervision and lab testing should be done once decision to start disulfiram is taken in consent with patient and/or guardians (**Table 8**).

**Table 8. Laboratory monitoring in disulfiram therapy**

When	What
Before starting DSF -	Breath or blood alcohol tests (if clinically indicated to confirm abstinence) LFT: Bilirubin, AST, ALT, GGT, Alkaline Phosphatase, Albumin, Prothrombin time Complete blood count, routine chemistries (if clinically indicated) KFT: Blood urea nitrogen, Cr Pregnancy test (girls)
After DSF initiation -	LFT: AST, ALT, GGT, Bilirubin at 2 weeks, monthly (or more frequently) for 6mth and then every 3 months thereafter

How long to continue?

DSF should be continued till patient has established stable, long-term alcohol abstinence. Adult data shows that disulfiram neither produce tolerance on long-term use nor there are withdrawal symptoms on discontinuation. The likelihood that a patient would remain continuously abstinent years after termination of medication therapy appears to be directly related to the length of time the patient continues supervised therapy.

## **B. Anti-craving agents**

**Naltrexone:** A known opioid antagonist, it has been shown to reduce relapse to heavy drinking by inhibiting alcohol-induced dopamine release in the reward circuitry. It lessens craving, blocks pleasurable effects and reduces urges to drink.

Before initiation of naltrexone therapy, rule out use of recent opioids lest it may precipitate unpleasant withdrawal symptoms. Adverse effects are self-limiting. There is no tolerance to efficacy or potential for abuse. Animal studies show LD<sub>50</sub> of naltrexone around 1100-1500 mg. In human (adult) studies, upto 800mg doses has been found to be safe.

There is no consensus on blood naltrexone concentrations required to provide effective management of problem alcohol use as is the case in opioid dependence subjects where blood naltrexone concentrations of 1-2 ng/ml have been considered to have therapeutic efficacy.

Naltrexone therapy gives better results in those where individuals have

- Good motivation and ready for supervised medication
- A history of opioid abuse/dependence and are seeking treatment for AUDs
- Intense alcohol cravings during treatment
- More somatic complaints
- A family history of alcohol dependence
- Asp40 variant of OPRM1 ( $\mu$  opioid receptor) on genotyping

Naltrexone should be continued for a minimum period of 3 months to 1 year. It is not associated with withdrawal symptoms on discontinuation, hence taper off is not required. Patients should continue to take naltrexone even if they slip and return to drinking because it may help limit the severity of relapse.

Naltrexone is also available as extended-release 380mg intramuscular injection once-a-month and naltrexone 170-340mg subcutaneous implant (lasts  $\geq$ 6 months depending on dose) in some countries. These are yet to be marketed in India but are available from online pharmacies.

Acamprosate: It is hypothesized that acamprosate helps modulate and normalize alcohol-related changes in brain activity through its action on glutamatergic pathways, thereby reducing symptoms of post-acute (protracted) withdrawal, such as disturbances in sleep and mood, that may trigger a relapse to drinking. There are several advantages of using acamprosate:

- No clinically significant drug-drug interactions
- Safe in cases of severe hepatic failure
- Safe in patients receiving concomitant opioid maintenance therapy
- No interaction with any other medication used in alcohol detoxification
- Extremely safe; no overdose risk upto 56g
- Adverse effects- mild and transient

Discontinuation of acamprosate may be considered once a patient has achieved stable abstinence from alcohol reports diminished craving, has established a sound plan and support for ongoing recovery and if a patient is not adhering to the medication regimen

Nalmefene. An antagonist at the mu- and delta-opioid receptor and a partial agonist at the kappa receptor, nalmefene prevents the alcohol-induced release of dopamine, reducing the drive to continue drinking. Nalmefene may be an option for patients who do not tolerate naltrexone or who do not respond to that medication. In a limited number of studies on adult subjects, nalmefene has been shown to have some efficacy in reducing total daily alcohol consumption and number of heavy drinking (more than 60g and 40g of pure alcohol per day for men and women, respectively) days. It helps alcohol-dependent patients to decrease their drinking towards low-risk levels and thus reducing potential health-hazards associated with alcohol use. It has been approved in European Union in 2013 for this indication in adults. Interesting to note is that it can be used as needed if the patient perceives a risk of drinking, giving more autonomy and flexibility to the patient, thus ensuring their active involvement in the treatment process.

Under trial (clinical/ pre-clinical). A number of potential molecules being researched: Baclofen, ondansetron, topiramate, ondansetron/topiramate combination, varenicline, gabapentin, prazosin, doxazosin, oxybate sodium, ABT-436-selective vasopressin receptor antagonist, LY2940094 -NOC-1 antagonist, monoamine stabilizer (-)-OSU6162, pioglitazone, ghrelin, GLP-1 and oxytocin

## **Psychosocial measures**

Intervention with adolescents should be informed by developmental theory and sensitivity to developmental processes. Most mild cases of AUD are effectively dealt with interventions aimed at bringing motivation to change, strengthening support system, and developing life skills. Evidence-based approaches for adolescent AUD problems include:

**Family systems approach.** Family-related factors that play a significant role in adolescent substance use disorders are characteristics of the parent–child relationship, parental effectiveness, and parental substance use. There are many approaches to family intervention for substance abuse treatment targeting the above mentioned factors and they have a few common goals (table 9). Unfortunately, family therapy has relatively high rates of attrition with adolescents.

**Brief Interventions (BI).** By definition, a BI is a time-limited, patient-centred approach aimed at raising awareness and insight into potentially health-limiting behaviour and encouraging behavioural change before more serious consequences develop. BIs have been applied within the substance use field and commonly refer to strategies based on motivational interviewing, harm reduction, and the stages of change to motivate substance users to take action towards reducing their problematic substance use. With these underlying principles in mind, BIs are not intended to treat addiction, but rather provide the opportunity for an early intervention with individuals in the general population who may be at risk of developing a substance use disorder. Thus, they are often delivered opportunistically within general healthcare settings or other community services. A common approach to the delivery of BIs is the FRAMES model developed by Miller and Sanchez. This model, based upon the motivational interviewing style, recommends that individuals are: provided with feedback about their risk of problems resulting from their behaviour; encouraged to take responsibility for their behaviour; provided with clear advice on how to reduce or change their behaviour; assisted to identify a menu of options for achieving behavioural change; treated with empathy and understanding; and develop self-efficacy for achieving change. This approach has been found to be particularly appealing to resistant populations, including substance users, who may not recognise their behaviour as problematic, are not ready for change, or are afraid of stigmatisation.

**Motivational Enhancement Therapy.** This Miller and Rollnick model utilizes specific interviewing techniques to help the patient work through ambivalence and move to the stage of contemplation. An empathetic non-confrontational relationship is formed in which reflection and reframing help the patient to explore the pros and cons of substance-using

behaviour. Self-efficacy is enhanced as the patient is helped to realize his or her capacities and options while recognizing that it is the patient's decision whether to change. Motivational interviewing involves 1-2 sessions with adolescents as an interim step before a more comprehensive cognitive behaviour therapy program.

Cognitive-behavioral skills building treatments. This therapeutic modality uses the learning principles of classic and operant conditioning along with approaches to correct cognitive distortions and underlying negative belief systems. This treatment includes learning specific techniques to deal with drugs and alcohol. Skills to refuse alcohol and drugs are taught and are practiced by role-playing exercises. For example, adolescents are taught to say "no" immediately in a firm manner and to make direct eye contact with the person offering them alcohol or drugs. They are then to suggest an alternative activity, or if that is not successful, simply to tell the person to stop asking. Cognitive-behavioral coping skills to deal with urges, to manage substance-using thoughts, and to handle emergencies and lapses are taught and practiced.

Group therapy and 12-step programs. Lately, reports about Group therapy and 12-step programs that are commonly used with adolescents are warranting caution. Group therapy may have iatrogenic effects as adolescent peer networks formed on the basis of deviance may provide a context where problem behaviours are reinforced. Similarly, teens may or may not respond to 12-step programs because these programs do little to accommodate the developmental and diagnostic issues associated with AUD among adolescents.

**Table 9. Goals and forms of family intervention**

Goals	Effective forms of family therapy
<ul style="list-style-type: none"> <li>● providing psychoeducation about SUDs               <ul style="list-style-type: none"> <li>- decreases familial resistance to treatment</li> <li>- increases motivation and engagement</li> </ul> </li> <li>● assisting parents and family to initiate and maintain efforts to get the adolescent into appropriate treatment and achieve abstinence</li> <li>● assisting parents and family to               <ul style="list-style-type: none"> <li>- establish or re-establish structure with consistent limit-setting and</li> <li>- careful monitoring of the adolescent's activities and behavior</li> </ul> </li> <li>● improving communication among family members</li> <li>● getting other family members into</li> </ul>	<ul style="list-style-type: none"> <li>● Functional family therapy</li> <li>● Brief strategic family therapy</li> <li>● Multisystemic therapy</li> <li>● Family systems therapy</li> <li>● Multidimensional family therapy</li> </ul>

treatment and/or support programs	
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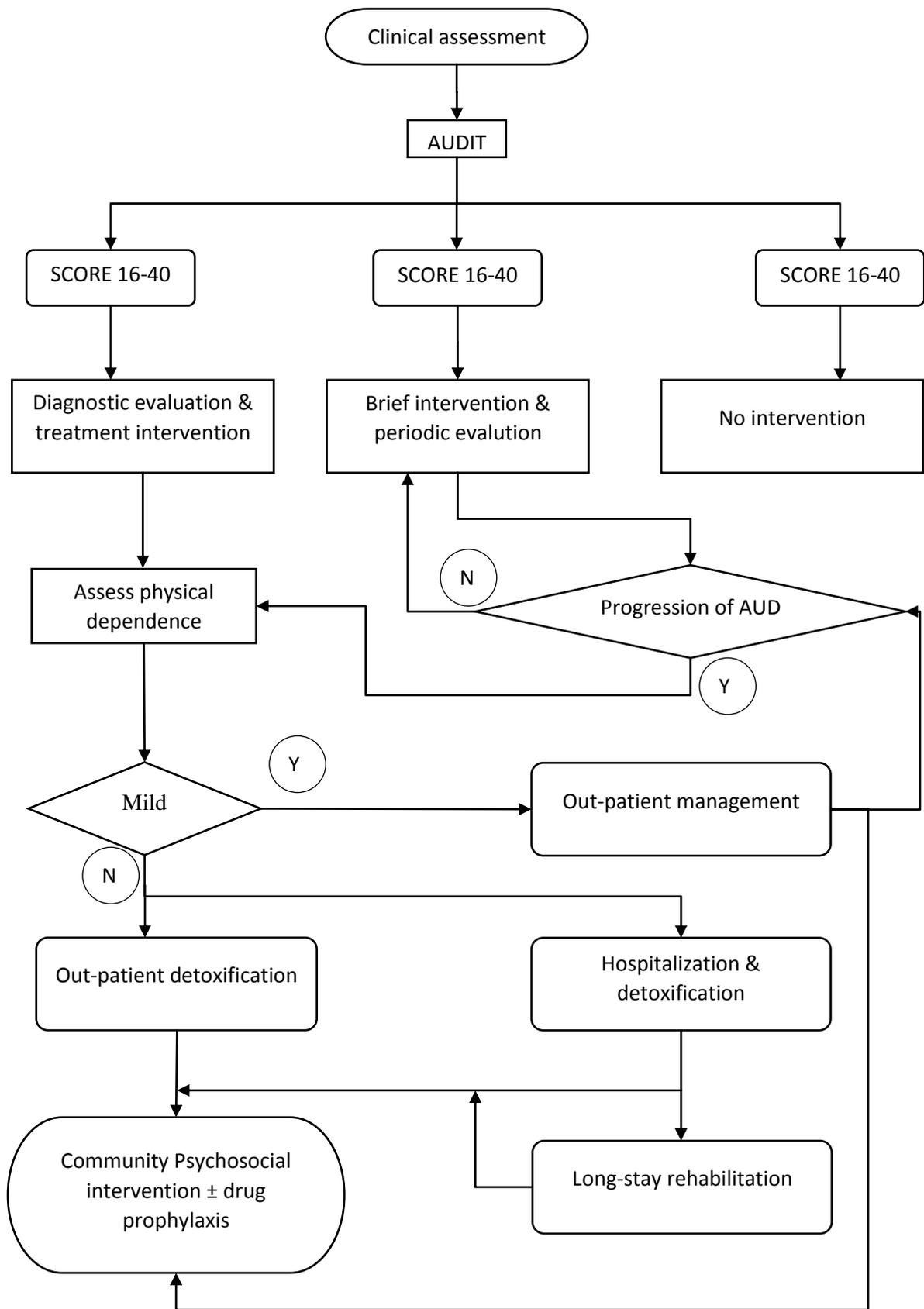
### Special populations

Pregnancy. The nutritional needs during pregnancy are 10-30% greater than normal; food intake needs to increase by as much as 140 percent to cover the needs of both mother and the foetus. Alcohol has direct toxic effects on foetal development, causing alcohol-related birth defects, including foetal alcohol syndrome. Accompanying nutritional deficiencies further impacts foetal development exacerbating the risk of developmental damage. Alcohol is also known to directly restrict nutrition flow to the foetus. The management should preferably be psychosocial along with enhanced nutrition in case of continuation of pregnancy. Pharmacological measures should only be used strictly under addiction specialist only when, in the judgment of the physician, the probable benefits outweigh the possible risks.

Co-morbid states. Adolescents who meet the criteria of substance use disorder, 60% also meet the criteria of a psychiatric disorder. Therefore, addressing a co-occurring psychopathology is equally important in dealing with AUD as it is related with better abstinence rates than treatment of AUD alone. Common co-morbidities include (but not limited to) attention-deficit/ hyperkinetic disorder, conduct disorder, anxiety, depression and post-traumatic stress disorder.

The treatment of AUD has been summarized in **figure 2**.

### **Figure 2: Algorithm for management of alcohol use disorders**



## MANAGEMENT OF CANNABIS USE DISORDER (CUD)

The use of cannabis is a growing concern. About 10%–30% of those who ever use cannabis develop a cannabis-use disorder within a decade. Among the general adolescent population (aged 13–19 years) frequency rather than duration of use may be a better predictor of meeting criteria for cannabis-use disorder.

With time the perception that cannabis use poses a significant risk of negative consequences has decreased. This is despite the fact (as per US data) that the average potency of delta-9-tetrahydrocannabinol (THC) in seized marijuana has increased from 3% in 1992 to 11% in 2010. The increase in potency coincides with an increase in treatment admissions for marijuana use disorders. This is pertinent to think about in counseling parents, who, recalling their own past experiences with marijuana, don't consider it likely that it could be harmful to their children. Another challenge is the lack of standardization in dose, potency, or chemical constituency of cannabis.

The changing cannabis use patterns among adolescents carry grave significance to public health as it is associated with hazardous behaviours such as drug peddling, violence, drunk driving, all forms of abuse (physical, sexual, emotional), and future development of substance use disorder.

The developmental characteristics of children and adolescents further complicate the matter. Among the clinical features that distinguish marijuana dependence are the drug's relatively mild withdrawal effects and marijuana users' frequent desire to pursue a goal of reducing—rather than abstaining from use. In addition, many individuals do not consider their marijuana use problematic; thus, their readiness to quit or reduce their marijuana use is low.

A typical cannabis withdrawal begins within 24 to 48 hours of abstinence, peak within 4 to 6 days, and last from 1 to 3 weeks, although significant individual differences occur in withdrawal expression. The marijuana withdrawal syndrome does not appear to include major medical or psychiatric consequences (table 10).

**Table 3. Cannabis symptomatology- intoxication and withdrawal**

<b>Intoxication</b>			<b>Withdrawal</b>
<i>Acute</i>	<i>Chronic</i>	<i>Pathological</i>	<i>Chronic user</i>

Euphoria, anxiety, relaxation, sensory stimulation, greater appetite Pupillary constriction, conjunctival injection, photophobia, nystagmus, diplopia Autonomic dysfunction (tachycardia, hypertension, orthostatic hypotension), Temporary bronchodilatation	Gynecomastia, reactive airway disease, lower sperm count, weight gain, lethargy, amotivational syndrome	Panic, delirium, psychosis, flashbacks	dysphoric mood (anxiety, irritability, depressed mood, restlessness), insomnia, EEG changes
<u>Cannabis &amp; cannabis preparations:</u> Marijuana, Pot, herb, grass, weed, reefer, dope, Buds, sinsemilla, Thai sticks, THC capsules, Hashish, Hashish Oil			

The management of cannabis intoxication, withdrawal and dependence is a work in progress and further research exploring better clinical practices is need of the hour (**figure 3**). Systematic research on psychosocial treatments for marijuana abuse or dependence began approximately 30 years ago, yet the number of controlled studies remains small. Outpatient treatment for marijuana abuse among adolescents has recently received increasing attention among researchers. Psychosocial treatments, such as motivational enhancement therapy (MET), cognitive-behavioural therapy (CBT) (with a focus on coping skills training), and contingency management (CM), as well as family-based treatments and mindfulness meditation have been carefully evaluated and have shown promise. Pharmacotherapy to manage cannabis use disorder is still in its infancy and any major breakthrough is yet to come.

MET. A typical MET regimen consists of one to four 45- to 90-minute individual sessions. Therapists use an empathetic non-confrontational style to guide the patient toward commitment to and action toward change (i.e., change talk). Therapeutic techniques include using non-judgemental reflecting and summarizing, understanding of ambivalence and its resolution, reinforcing self-efficacy, rolling with resistance, and setting goals and plans to achieve them in collaboration with client. Examples of tested interventions include 2-session Adolescent Cannabis Check-Up (ACCU), Brief Motivational Interviewing (MI) and single session Marijuana Check-Up (MCU).

CBT. CBT is used to teach skills relevant to quitting marijuana and avoiding or managing other problems that may interfere with good outcomes. Techniques typically involved are self-monitoring, cost-benefit analysis, cognitive restructuring, role playing and modelling. Number of weekly sessions, individual or in group, vary from 6-14 each lasting 45- to 60-minute. Sessions help patients by developing insights into their recent marijuana use or cravings, development of planned contingencies to situations that may trigger use or craving, learning alternative pro-social behaviours, interactive exercises, and practice assignments.

Contingency Management (CM). This technique is now being advocated to enhance the potency of MET- and CBT-based treatments. CM is based on the classical concept of operant-conditioning and is most effective if reinforcement is frequent, rewards are immediate and perceived value of the reinforcer is high, advancing reinforcement schedule and failure of achieving target behaviour/s results in resetting of reinforcement schedule. The marijuana CM intervention adapts the abstinence-based voucher approach. The vouchers are contingent on marijuana abstinence, confirmed by twice-weekly drug testing, and their value escalates with each consecutive negative drug test. Patients exchange them for prosocial retail items or services that, it is hoped, will serve as alternatives to marijuana use. CM helps in enhances abstinence during treatment and when applied as adjunct to CBT, improves the durability of abstinence.

Family-based treatments. Specific forms of family-based treatment that have been tested include functional family therapy, multidimensional family therapy, multisystemic therapy, family support network intervention, and brief strategic family therapy. Among these MDFT has been found to have some efficacy in adolescents. It focuses on four interdependent treatment domains- the adolescent domain, the parent domain, the interactional domain, and the extrafamilial domain. MDFT have been shown to increase treatment compliance and reductions in frequency and quantity of cannabis use. The Adolescent Community Reinforcement Approach (ACRA) is a multi-system behavioral therapy that seeks to integrate cognitive behavioral skills training with collaborative community support, and contingency management.

Mindfulness meditation. It is again being used to augment other treatment approaches. More research is required to know about the exact ways to include in the treatment paradigm of cannabis use disorders.

Combined approaches. A combination MET and CBT (e.g., Marijuana Treatment Project (MTP), Cannabis Youth Treatment study (CYT)) has been studied in CUD and have been found to be more effective than either alone in terms of reduction in number of use-days, rates of abstinence, and dependence symptoms.

Findings suggest that a combination of these three modalities produces the best abstinence outcomes, although abstinence rates remain modest and decline after treatment. The optimal duration of these therapies is not known though evidence suggests that longer duration improves outcomes.

Technology-based. Computer-/ internet-/ telephone- based interventions have been evaluated and found to have similar therapeutic efficacy and better cost effectiveness in comparison to therapist-administered psychotherapies. The interventions are based on MET/CBT, motivational interviewing/CBT, ecological momentary assessment (EMA) or self-guided self-help paradigms.

Pharmacotherapy. Drug treatment of cannabis withdrawal syndrome and cannabis use disorder till now is mostly symptomatic. Pharmacotherapy trials have been conducted as adjunctive interventions to psychosocial treatment. No pharmacologic treatment has emerged as clearly efficacious till date. Some old drugs have been investigated for cannabis use disorder with equivocal findings. Several newer molecules are in different phases of clinical trials though only time will tell if any one or more of them will get evidence-based approval (table 11).

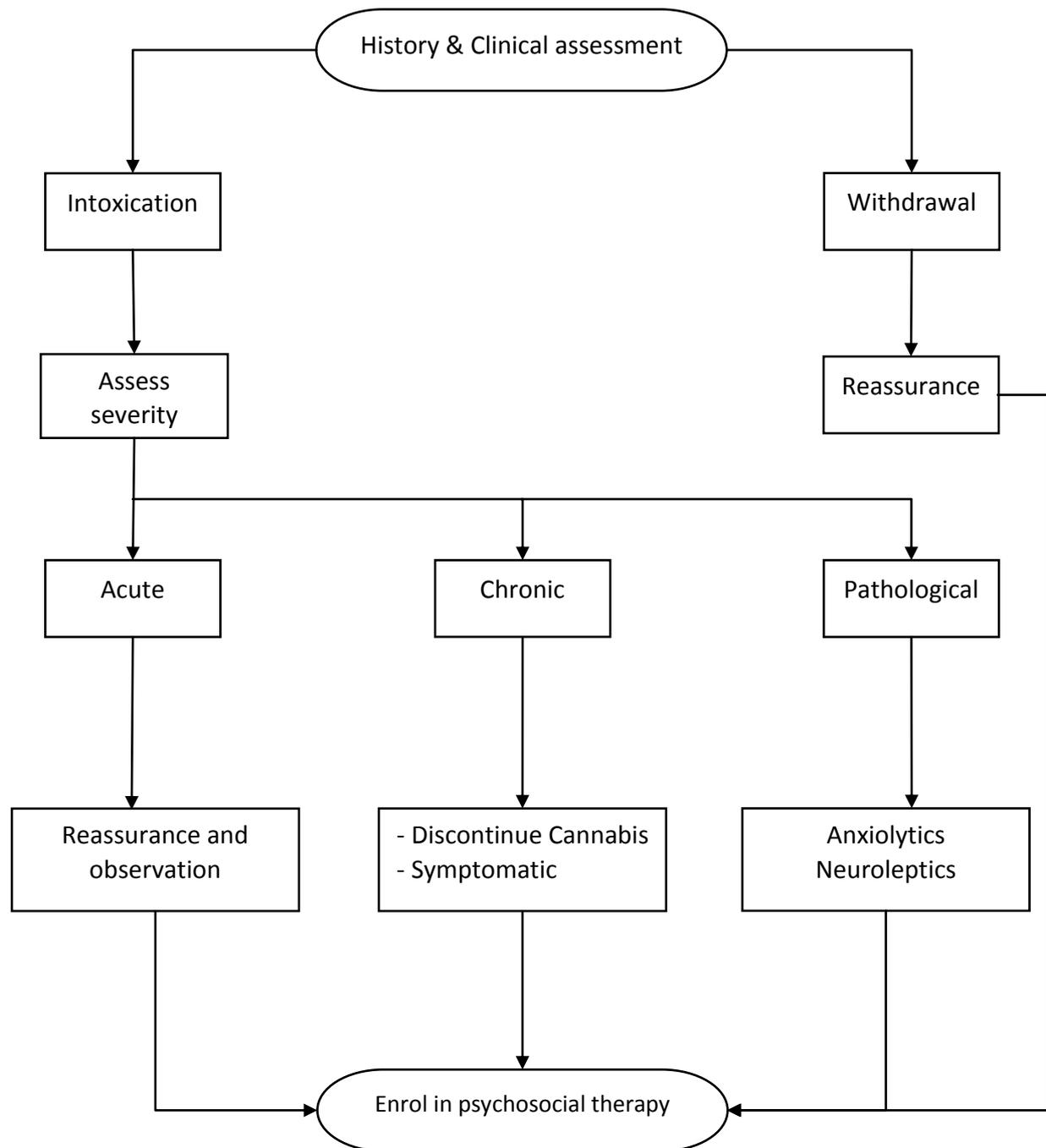
The apparently less severe nature of marijuana dependence does not necessarily mean that marijuana addiction is easier to overcome. Patients who aim for abstinence appear to obtain better outcomes. Whether complete abstinence be the goal of treatment is a raging matter of debate worldwide and evidence regarding it is non-existing. The low cost of marijuana, the typical pattern of multiple daily use by those addicted, the less dramatic consequences, and ambivalence may increase the difficulty of quitting.

**Table 4. Medications being examined in the management of cannabis use disorder**

Class	Examples	Remarks
Anti-depressants	Bupropion, nefazodone, mirtazapine, fluoxetine, vilazodone, venlafaxine (extended-release)	No efficacy or worsening in CWS &/or associated depression
Cannabinoid	delta-9-tetrahydrocannabinol (THC)	Under investigation
Cannabinoid (CB1 receptor) agonists	Dronabinol (synthetic THC)	20–90 mg (in divided doses) in reducing cannabis-withdrawal symptoms
	Nabilone	6–8mg/d; superior bioavailability, more predictable dose–response relationship, less individual variability in drug response.
	Nabiximols (1:1 ratio of Δ9-THC to cannabidiol (CBD))	Most promising; oromucosal, botanically-derived spray; 300–600 mg/day
Selective CB1 receptor	Rimonabant	Withdrawn since 2008 due to

antagonist/inverse agonist		reports of severe depression and suicidal thoughts
$\alpha$ 2-adrenergic receptor agonist	Clonidine, lofexidine	Lofexidine with dronabinol appears promising (2.4mg/60mg)
$\mu$ opioid antagonist	Naltrexone	Enhanced subjective effects of cannabis
Non-benzodiazepine anxiolytic	Buspirone (5-HT <sub>1A</sub> receptor agonist and a D2 receptor antagonist)	Reduced cannabis use, faster initiation of abstinence, 60mg/d
Anticonvulsants and Mood Stabilizers	Divalproex	Divalproex worsened withdrawal with higher adverse events and poor compliance
	Lithium	Lithium (600-900mg/d) reduces pain abdomen& nightmares of CWS but not overall CWS scores
	Gabapentin	Decreased withdrawal, high dropout rate; 1200mg/d
Catechol-O-methyl transferase (COMT) inhibitor	Entacapone	Reduced craving, 2000mg/d; no significant adverse events
Sedative-Hypnotics	Zolpidem (Extended-release)	
$\gamma$ -aminobutyric acid-B receptor agonist	Baclofen	No benefits reported
Antipsychotic	Quetiapine	Increased craving
Hormone	Oxytocin	Pre-clinical- blocks drug reinforcement; 40IU
Glutamatergic anti-oxidant	N-acetylcysteine (NAC) (down-regulates of the cystine-glutamate exchanger)	Decreased self-reported use during treatment duration; 1200-2400mg/d
Endocannabinoid catabolic enzymes inhibitors: Fatty acid amide hydrolase Monoacylglycerol lipase	JZL184 URB597	Pre-clinical and clinical trials: reduced withdrawal symptoms; appears safe in humans
Nicotinic acetylcholine receptor (nAChR) partial agonist ( $\alpha$ 4 $\beta$ 2)	Varenicline	No RCTs yet for CUD

**Figure 1. Management of Cannabis use disorder**



# **INHALANTS USE DISORDER**

## **Background**

- Inhalants are chemical vapors or gases classified into four broad types- volatile solvents, aerosols sprays, gases and nitrites.
- Inhalants can be used by huffing (soaking a rag and placing it on the mouth to inhale) – most common, sniffing/snorting (inhaling through the nose), bagging (inhaling from a bag that contains the substance) and dusting (spraying directly into the mouth or nose).
- Effect is that of CNS depression.
- Intoxication occurs rapidly and is relatively short-lived.
- More common in lower socioeconomic status, street children, school dropout, conduct disorder low parental supervision, family history of substance dependence.

## **Management**

Ethical considerations specific to children and adolescents need to be considered. Setting for treatment needs to be decided based on clinical features. Inpatient treatment should be reserved for patients with severe dependence, longer duration of use, multiple failed abstinent attempts in the past, significant health complications, concurrent use of multiple other substances, severe dysfunction at home or school, absent/minimal family support, presence of familial psychopathology interfering with treatment and care, longer distance from treatment centre making outpatient follow up difficult.

Management can be divided into short term and long term, pharmacological and non-pharmacological.

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## **Short term:**

## **Assessment**

- A detailed work up of patients with elaborate history of substance use and its medical and psychological complications needs to be done. History about family, school, work, sexual, living conditions, temperament, comorbid conditions like ADHD, Conduct disorder needs to be taken. General physical examination, systemic examination and a mental state examination needs to be done covering assessment of

behaviour, speech, affect, thought and perceptual disturbances. Cognitive functions like consciousness, orientation, memory, intelligence, abstract thinking and judgment need to be checked. Motivation to quit substance needs to be assessed. Motivational interviewing technique can be used while eliciting history to enhance person's motivation.

- Screening to be done based on clinical pointers for suspected inhalant use like any unusual odor or stains on fingernails, body parts or clothes, sniffer's rash around nose and mouth, rhinorrhea, injected sclera, deterioration in physical appearance, a recent change in behavior, drop in school performance/ frequent absenteeism, impairments in attention, memory or other cognitive functions.
- Diagnosis should be established as per ICD 10 and DSM 5 classificatory system.
- Investigation: Apart from routine investigation, urine screening for other substance use, serology for viral markers in case of high risk behaviours and other special investigation as per associated physical comorbidities are important.
- General substance withdrawal rating proforma and rating of substance and/or behaviour related problems in terms of (health, education, finance, legal, sexual, family and social) are required for assessing the progress of treatment.
- Appropriate consultation with pulmonologist/ ENT for (cough, wheezing, dyspnoea, emphysema, pneumonitis), cardiologist for (dysrhythmias, hypoxic-induced heart block), neurologist for (encephalopathy, cerebellar ataxia, neuropathies, white matter degeneration/atrophy, parkinsonism), dermatologist for (burns, contact dermatitis, peri-oral eczema) is required.

## **Management**

**Inhalant Intoxication:** Signs and symptoms includedizziness, nystagmus, incoordination, slurred speech, unsteady gait, lethargy, depressed reflexes, psychomotor retardation, tremor, generalized muscle weakness, blurred vision or diplopia, stupor or coma, euphoria.

## **Treatment**

- No specific antidote available.
- Basic supportive care.
- Ensure safety of patient with calm, supportive, reassuring environment.

- Careful monitoring of vitals, temperature, oxygen saturation, orientation, level of consciousness, changes in mood and behavior.
- Use of sedatives should be avoided.
- Complications, if any, must be treated by specific treatment measures after appropriate referral/consultation.
- Patient can be discharged from medical care (under supervision of a guardian) when the symptoms have fully recovered (usually less than 4-6 hours if uncomplicated) and family member or caregiver should keep monitoring the patient for at least 24 hours.

**Inhalant Withdrawals:** Withdrawal symptoms are often mild and may last from 2-5 days.

**Detoxification:**

- Consists of basic supportive care and symptomatic medical management like analgesics for headache or somatic pains, benzodiazepines for a short period to manage the anxiety, agitation and sleep disturbances.
- No evidence, apart from a case series, on any specific pharmacotherapy to manage inhalant withdrawals.
- Inpatient treatment is required for severe addiction, multiple substance abuse and those whose home environment is pathological and not supportive.
- In outpatient treatment, frequency and duration of sessions may vary depending on patient characteristics and individualized goals.

**Treatment of Co morbid conditions**

- Attention deficit/hyperactivity disorders, learning disorders, oppositional defiant disorder, conduct disorder, etc. – need to be addressed to improve short and long term outcome of management plan
- Inhalant-induced psychiatric disorders usually subside with supportive treatment and maintenance of abstinence. Specific psychotropic medications are not warranted, unless the symptoms are severe, risky or life-threatening.

**Long term**

There is no evidence for any pharmaco-prophylaxis, it is important to keep patient under active follow up with regular urine screening for substance use and regular brief sessions enquiring patients motivation and emphasizing on principles of relapse prevention counselling

### **Non pharmacological interventions:**

- Psychoeducation of patient and family with special emphasis on harm minimisation like advice on not to use inhalants when alone or in secretive, enclosed spaces, when smoking or near a lit cigarette or lighter, when there is physical exertion and not to drive (for next several hours) after using inhalants.
- Motivation enhancement treatment.
- Relapse prevention therapy.
- Cognitive-behavioral therapy (CBT) based approaches: both individual and group CBT has been shown to be effective.
- Supportive psychotherapy: among the patients in whom CBT is not feasible.
- Contingency management
- Psychosocial intervention

Therapeutic approaches should include engagement of the patient and involvement of the family. Emphasis should be placed on re-entry into school and addressing school re-adjustment issues. Activity and engagement based approaches should be used. Life Skills based approaches like activities aimed at money management, designed to allow the children to reflect on various alternate/healthy ways of spending money and thus, increase options of spending money, especially for street children can be used. Residential rehabilitation is suitable only for chronic, heavy users of inhalants (with or without multiple substance use) for whom other treatment options have shown multiple failures. Vocational rehabilitation: for street children for effective schooling and employment opportunities can be used.

### **TOBACCO USE DISORDERS:**

#### **Background:**

- The goals for adolescent cigarette smoking efforts must include both primary prevention and smoking cessation.
- Therapy should be individualized, based on smoking patterns, patient preferences, and concomitant disease states
- Most patients are managed at outpatient setting of various specialties and inpatient management for tobacco use is rare except for admissions for treatment of various other medical or psychiatric disorders including inpatient treatment of other substance use.
- Behavioral treatments for adolescent smoking cessation are the main treatment recommended for teen smokers at this time

### **Non pharmacological**

- **Motivational Interviewing** is a useful technique to engage the dependent tobacco user to think about his problematic tobacco use and initiating cessation.
- **Brief Intervention** should be provided to all tobacco users in all outpatient departments which will consist of enquiry into health problems and linking tobacco as one of the causative role, psychoeducation about addiction, providing a small self-help booklet, and offering medications to help in quitting.
- **Motivation enhancement treatment and relapse prevention therapy:** Objective is to increase the motivation either to quit or decrease tobacco use and to prevent relapse respectively. Intensive Counseling Needs to be provided by trained personnel and the intervention should depend on the motivational stage of the person.
- **CBT and Contingency management:** have also shown to be useful in smoking cessation treatment in adolescence.

### **Pharmacotherapy**

- Number of factors need to be considered in teen to quit smoking like efficacy, side effects, cost and ease of use.
- There are no US FDA-approved medications for adolescent smoking cessation.

- The US Food and Drug Administration (FDA) has approved seven medications for the purpose of smoking cessation in adults. Those medications include Nicotine Replacement Therapies (NRT) delivered in the form of a patch, inhaler, lozenge, gum or nasal spray, as well as bupropion sustained-release (SR) and varenicline.
- Studies in adolescent age group are starting to emerge but are lagging behind adult population.

### **Nicotine Replacement Therapy (NRT)**

- Studies evaluating efficacy of NRT in adolescent group has shown mixed results to be as efficacious as in adult group.
- NRT is available as Gum, Patch, Pastilles/Lozenge, Spray, and Inhaler for adult group but in adolescence only gums, patches, and sprays have been studied.
- The only form of NRT that has been shown to have any benefit to adolescent smokers is the nicotine patch. The patch may be helpful to some adolescent smokers but relapse after treatment is common.
- As, there is lack of data for this age group, data from adult recommendations are often used in routine clinical practice. Dose is dependent on severity of tobacco use (FTND). Adequate dosage and duration of NRT is associated with better outcome. It can be initiated while person is not fully decided on quitting tobacco. The quit date is prior to beginning nicotine replacement therapy. Optimal duration of treatment is three months.
- NRTs such as nicotine patches, gum, and lozenges are available over the counter (OTC). Sale of these OTC products is restricted to persons at least 18 years of age. Some packages for Nicotine gum, lozenges specifically state, “Not for sale to those under age 18 years of age. If you are under 18, ask a doctor before use.”Therefore, while the OTC purchase of NRT is not permitted by adolescents, adolescents may obtain the products under the supervision of a physician via a prescription. Other forms of NRT such as the nicotine inhaler and nicotine nasal spray are only available with a prescription.

**Table 12: Nicotine Replacement Therapy in Adolescents**

NRT preparation	FDA approved adult Recommendations	Studies in
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		adolescence
Nicotine Gum/ Lozenge 2mg, 4mg	< 25 cig= 2mg every 1-2 hrly > 25 cig = 4mg every 1-2 hourly(maximum: 24 gums/day) <u>Duration: 12 wks</u> Wk 1-6:1 piece every 1-2 h; Wk 7-9: 1 piece every 2- 4 h Wk 10-12: 1 piece every 4-8 h	Gums- yes Lozenges- No
Nicotine Patch 21mg, 14mg, 7 mg	>10 cigarettes/day d: 21 mg/day; <10 cigarettes per d: 14 mg per day <u>Duration : 10-12 wk</u> Wk 1-6:21 mg/day or 14mg/day; Wk 7-9: 14 mg/day or 7mg/day Wk 10-12: 7mg/day	Yes
Nicotine Inhaler 10-mg cartridge delivers 4 mg of nicotine per spray	Usual: 6-16 cartridges per day Initially: 1 cartridge every 1-2 h Duration: 12-24wk Taper in last 6-12 wk	No
Nicotine Nasal spray	1 spray (1 mg nicotine) in each nostril Initial treatment is 1–2 doses per h, as needed. Typical dosing is 8–40 doses/d. Duration : 12-24wk	Yes

### Non Nicotine Pharmacotherapy

- Varenicline, bupropion, nortriptyline and cytosine are studied in adults but convincing data on adolescents are lacking.
- Varenicline is not approved in adolescent population and very few studies have evaluated its use in this age group. Its use is restricted due to a black box warning in adult population of serious neuropsychiatric symptoms—including changes in behavior, agitation, hostility, suicidal ideation and behavior, and depressed mood.
- Bupropion SR though not approved by US FDA, its use has shown mixed results in efficacy when used in combination with NRT and tobacco cessation counselling in adolescence. It is however not labeled for use in children younger than 18 years for any indication due to a black box warning added to all antidepressants (including proprietary Bupropion) that warns about the increased risk of suicidal thinking and behavior in children and adolescents. Though not approved for smoking cessation, it is however approved for use in adolescent depression as well as ADHD.

**Long term:**

- Behavioral counseling and long-term follow-up increases the abstinence rate.
- Treatment of comorbid psychiatric disorders like ADHD, conduct disorder increases the abstinence rate in long term.

**OPIOID USE DISORDERS:**

Despite increasing trends towards use of opioids in adolescent age group they still do not receive adequate treatment due to restrictions on use of pharmacotherapy in this age group. Opioid dependence imposes a significant economic burden on society as it has an effect on school performance, productivity and later unemployment due to absenteeism, and premature mortality. There is increasing use of injecting opioids in adolescence due to their increasing high risk behaviour and this is strongly associated with HIV, hepatitis C and other blood borne infectious diseases. In India, opioids are the drugs most commonly injected by IDUs.

Assessment requires a detailed history covering all aspects of substance use, psychosocial factors, history for co-morbidities, relevant past, family, social, legal, personal, educational, sexual, high risk behaviours, present living conditions, support system. Detailed physical examination with special look out for stigmata of injection use, and markers for hepatitis is required. Systemic examination, mental state examination, cognitive functions, insight and motivation of the patient is also important. Apart from routine investigation, viral markers for high risk sexual behaviours and urine screening to confirm opioid use and to look for other substance use are required to plan the individualized management.

**Opioid intoxication:** A triad of (i) Coma / Unconsciousness, (ii) severely depressed respiration, and (iii) pinpoint pupils.

**Management:** It is important to ensure clear airways and breathing, and other supportive measures. Initial IV Naloxone dosing (0.8mg/70 kg) is to be given. If there is no response with to initial dosage - Naloxone may be repeated at interval of 2-3 minutes (Max 10 mg). If No response alternative cause for overdose is to be considered

**Detoxification (withdrawal management) in opioid dependence****Clonidine based symptom management**

- Reserved for mild cases as determined by COWS (clinical opiate withdrawal scale)-score and in whom long term prophylaxis is planned with opioid antagonist like Naltrexone.
- It requires careful monitoring of side effects like hypotension.
- Sedative hypnotics or anxiolytics for sleep difficulties and or anxiety, antiemetics for nausea and vomiting, NSAIDS for muscle cramps, antispasmodic for gastrointestinal cramping and adequate hydration or oral rehydration solution for loose stools are required.
- When withdrawal symptoms are severe and clonidine based management is planned it is preferable to have inpatient management.

### **Agonist agent based:**

- It is treatment of choice for detoxification in adults, but in children and adolescence, both buprenorphine and methadone are used with caution considering poor tolerability.

### **Buprenorphine:**

- It is a partial opioid agonist and is available for sublingual (under-the-tongue) administration both in a stand-alone formulation and in combination with another agent called naloxone. The naloxone in the combined formulation is included to deter diversion or abuse of the medication by causing a withdrawal reaction if it is intravenously injected.
- It is US FDA approved for patients above 16 years of age.
- For detoxification, stable dose is calculated by monitoring COWS score regularly and later once symptoms are managed adequately, dose is tapered gradually. Since it has long duration of action minimal withdrawal symptoms are seen during dose reduction.

### **Methadone:**

- Though not approved, it can be given for adolescent 16 years and above. Withdrawal management using methadone should be avoided in the outpatient settings.

### **Long term management**

## **Opioid antagonist treatment (Naltrexone)**

- Naltrexone though not US FDA approved, it is often used in adolescent population
- Criteria for using opioid antagonist treatment include, relatively shorter duration of opioid use, less severe dependence, high motivation, better social and occupational status, good social support.
- As an opioid antagonist, it can precipitate sudden withdrawal symptoms in a patient who recently used opioids.
- Therefore, clinicians should only administer naltrexone 3 to 6 days after the most recent use of short-acting opioids (eg, most short-acting prescription opioids or heroin) and 7 to 10 days after the most recent use of long-acting opioids (e.g., most long-acting prescription opioids, buprenorphine, or methadone)
- It is important to check results of a urine drug test (UDT) before starting Naltrexone and to observe the first oral dose in the clinic to monitor (60 minutes) for signs of withdrawal
- Naloxone challenge test is also used before starting Naltrexone

## **Opioid agonist maintenance treatment/ opioid substitution treatment**

Opioid substitution treatment in India is a program which includes dispensing opioid agonist agent along with non-pharmacological measures like group meetings, role plays, psychoeducational meetings etc. held at weekly follow up visits.

Criteria for determining suitability for OST include long-duration opioid users, severe dependence, high risk of relapse, willing to comply with the requirements, harm reduction strategy in someone with HIV or HBV positive status with IDU.

The specific objectives of agonist maintenance treatment are

- To reduce illegal and other harmful drug use.
- Improve the patient's health and well-being.
- Reduce the risk of transmission of blood-borne infectious diseases.
- Reduce death and other medical morbidities associated with drug use.
- Reduce crime committed by patients.
- Facilitate an improvement in the patient's occupational and social functioning.

- Improve the economic status of patients and their families.

Treatment of comorbidities and associated medical complication improves the long term outcome.

### Non-pharmacological

- Psychoeducation
- Motivation enhancement treatment
- Relapse prevention therapy
- Emphasis on concept of harm reduction
- Psychosocial intervention in form of school or educational and vocational rehabilitation

### PSYCHOSTIMULANTS

The various psychostimulants and their effects are shown in table 13.

**Table 13. Half life and approximate time course of pharmacological action of various stimulants**

<b>Drug</b>	<b>Physical signs/symptoms of intoxication</b>	<b>Most common mental state changes</b>	<b>Withdrawal symptoms</b>	<b>Duration of withdrawal</b>	<b>Duration of detection in the urine</b>
<b>Amfetamine-type stimulants</b>	Tachycardia Increased BP Anorexia Tremor Restlessness	Visual/tactile/ Olfactory Auditory Hallucinations Paranoia Elation	Fatigue Hunger Depression Irritability Craving Social withdrawal	Peaks 7-34 hours Lasts maximum of 5 days	Depends on half-life, mostly 48-72 hours
<b>Cocaine</b>	Tachycardia/ Tachypnoea Increased BP/ Headache Respiratory depression Chest pain	Euphoria Paranoid Psychosis Panic attacks/ Anxiety Insomnia/ Excitement	Fatigue Hunger Depression Irritability Craving Social withdrawal	12-18 hours	Up to 96 hours



## Management of neuropsychiatric complications of stimulant use

### Stimulant-induced psychosis

- General supportive measures, a low stimulus environment, reassurance and support, while waiting for the symptoms to remit spontaneously with abstinence
- If symptoms are severe and the patient becomes a danger to him/herself or to others, the patient should be placed under mental health act, medicated and hospitalized.
- Exclude other causes of an organic brain syndrome
- **Benzodiazepines** are prescribed as the first line of treatment for stimulant induced psychosis:
  - Diazepam-10-20 mg orally; repeat 2-hourly if necessary, until the patient is calm and mildly sedated; monitor vital signs every hour, maximum dose 120 mg in 24 h. if more diazepam is required, seek specialist advice.
  - In several cases, it may be necessary to give diazepam 10 mg slowly IV, repeated after 10 min if necessary. Alternatively, midazolam 5 mg IM or IV may be administered, then repeat after 10-30 mins if required.

### *Precautions*

- Patients requiring intravenous benzodiazepines should always be nursed in high dependency unit or intensive care unit.
- Patients with chronic airflow limitation may require lower doses of benzodiazepines. Do oximeter readings before and after each dose, may require transfer to high dependency or ICU.
- Patients with hepatic decompensation; give a shorter acting benzodiazepine such as oral oxazepam.

***Antipsychotic agents:*** antipsychotics are used to supplement benzodiazepines particularly when there is a sub-optimal response.

- Haloperidol 2.5-5 mg intramuscularly three times daily or olanzapine: 5-10 mg orally, intramuscularly or as a wafer OR
- Quetiapine 25-100 mg every 6 h, titrated according to response
- Review antipsychotic medication after a few days. Refer to psychiatrist.
- A diagnosis of a possible underlying or persistent psychotic disorder must be deferred until a reassessment can be made in a drug free state. Those with florid psychoses usually remit within a few days and the user returns to normal functioning although

some retain a vulnerability to such episodes. Only a minority (1-15%) persist beyond one month and many of these will have underlying psychiatric disorders.

### **Chronic or recurrent psychotic states**

- Stimulants may precipitate psychosis in an individual with an underlying vulnerability to psychosis (Such as schizophrenia) or a trigger and exacerbate psychotic symptoms in those with pre-existing disorders.
- A diagnosis of a possible underlying or persistent psychotic disorder must be deferred until a reassessment can be made in a drug free state. Many of those whose psychotic symptoms persist for more than a month after abstinence from stimulants will have underlying psychiatric disorders.
- The prognosis is variable and those who have experienced an acute psychotic episode are more vulnerable to future episodes (possibly through sensitization ) on exposure to the drug, often at lower levels.
- The underlying psychotic disorder must be appropriately treated and cessation of stimulant or dopamine use is important as there appears to be some recovery of dopamine system function with abstinence.

### **Management of depression in persons with stimulant abuse/overdose**

Severely depressed and suicidal patients need to be managed inpatient setting.

The efficacy of antidepressants in reducing stimulant drug use is confined to those who are depressed. It is useful to delay commencing antidepressants until after the individual has stopped using 2-4 weeks to reassess the depressive symptoms. The advantages of waiting are improved diagnostic accuracy, avoidance of potentially unnecessary medication and probably an improvement in compliance and efficacy. Doxepin or fluoxetine may be helpful.

In patients with well documented history of pre-existing mood disorder occurring during periods of abstinence, or with a strong family history of a mood disorder, medication should be started early during the withdrawal phase.

- The combination of psychostimulants and antidepressants (SSRIs, MAOIs), may place the person at risk of the serotonin syndrome. SSRIs should not be prescribed if the patient continues to use a psychostimulant. Patients prescribed SSRIs must be warned of the risk of developing the serotonin syndrome if they

release to stimulant use. Tricyclic antidepressant drugs should be used with caution because of their potential lethality in suicidal patients.

Other drugs that may be prescribed for intercurrent conditions, such as tramadol or fentanyl for pain, and St John's Wort may be also associated with serotonergic syndrome and must be prescribed with caution.

**The serotonin syndrome :** A potentially fatal syndrome due to excess central serotonergic activity. May be precipitated when psychostimulant use is combined with the use of SSRI's or other medications, which increase serotonin levels.

*Clinical features:*

- Hyperthermia
- Tremulousness, agitation
- Dilated pupils
- CVS: hypertension
- GIT: hyperactive bowels, diarrhoea
- CNS: hyperreflexia, hypertonia, clonus, coma.

*Management*

- General supportive measures airways, breathing, circulation
- Intravenous fluids; ensure adequate amounts and adequate urine output (for rhabdomyolysis, dehydration, hypotension).
- External cooling
- Sedation with benzodiazepines
- Consider a serotonin receptor antagonist such as cyproheptadine or an atypical neuroleptic, e.g. olanzapine or quetiapine, (after ensuring that an anticholinergic agent has not been taken concurrently.)
- The patient may require intubation and mechanical ventilation.

**Anxiety** provided underlying medical illness and a pre-existing anxiety disorder have been ruled out, treatment involves reassuring the patient the reaction is due to drug and will resolve completely as the drug is metabolized. If medication is required, a short-term use of benzodiazepine (e.g. diazepam) is appropriate.

## **Harm reduction/palliation for psychostimulant users**

### **Examples of advice to reduce harm from stimulant use**

- Advise that inhaling or injecting stimulants place the individual at risk of dependence and various medical, neuropsychiatric, and social complications.
- If individuals insist on injecting stimulants, check that they are aware of sources of supply of clean needles and the risk transmission of hepatitis C and HIV/Aids from injecting paraphernalia.
- Avoid effects of hyperthermia- ensure a well-ventilated dance floor. Rest and rehydrate but be aware that drinking excess quantities of water may cause water intoxication.
- If someone feels unwell, do not delay in seeking help- call an ambulance urgently
- Do not drive under the influence of stimulants because of the increased risk of accidents.
- Individuals with a history of mental health problems (anxiety, depression, psychosis) should not use stimulants because of their potential to precipitate, exacerbate or prolong these psychiatric problems.
- Advise patients not to use psychostimulants if they are not prescribed SSRI antidepressants (e.g. citalopram, fluoxetine, paroxetine, fluvoxamine, sertraline) because of the risk of developing the serotonin syndrome.
- Avoid combining stimulants with other drugs, (especially with alcohol, cannabis, benzodiazepines, opioids) as polydrug use increases the risk of overdose, accidents and other complications.
- Do not use stimulants if you are pregnant or liable to become pregnant or if you have underlying cardiovascular or other medical problems.

### ***Investigation for psychostimulants intoxication***

- Routine investigations
  - Full blood counts
  - Kidney function tests
  - Liver function tests
  - Thyroid function test
  - Blood sugar
  - Serological tests for hepatitis C, B and HIV

- Screen for sexually transmitted infections
- Other investigations:
  - Urine drug screen (for cocaine request plasma benzoylecgonia, the demethylated metabolite of cocaine, as cocaine itself has a variable and short half-life).
  - ECGs: to exclude arrhythmias in toxicity
  - Cardiac enzymes, troponin levels-where ischaemic heart disease is suspected (cocaine)
  - CPK to exclude rhabdomyolysis
  - Chest X ray where indicated
  - CT or MRI head: if indicated e.g. to exclude cerebrovascular accidents.

### Management of stimulant intoxication

Table 14 presents the management of stimulant intoxication.

**Table 14: Management of stimulant intoxication**

ATS	MDMA	COCAINE	Management of complications of stimulant intoxications
<ul style="list-style-type: none"> <li>▪ No specific antidote</li> <li>▪ General symptomatic and supportive measures</li> <li>▪ Monitor closely (ECG monitor if tachyarrhythmias present.)</li> <li>▪ Clear airways, breathing and circulation</li> <li>▪ Promote cooling if hypothermic</li> <li>▪ Rehydrate &amp; correct fluid and electrolyte disturbance.</li> <li>▪ Acidification of urine</li> <li>▪ If agitation, sedate with benzodiazepines</li> <li>▪ If extreme agitation or violence, give diazepam IV.</li> </ul>	<ul style="list-style-type: none"> <li>▪ In addition to measures for ATS:</li> <li>▪ Emesis or gastric lavage indicated if the patient has MDMA toxicity from oral intake, is alert and has taken MDMA less than 4 hrs previously.</li> <li>▪ Rehydrate and correct fluid and electrolyte imbalance, particularly hyponatraemia.</li> </ul>	<ul style="list-style-type: none"> <li>▪ In addition to earlier measures:</li> <li>▪ Any person with chest pain after cocaine use should be admitted for observation.</li> <li>▪ Hypertension may be treated with an alpha blocker(phentolamine) or a combined alpha and beta-adrenergic blocker (e.g. Labetalol.)</li> <li>▪ Beta blockers (e.g. propranolol) should be avoided as they exacerbate cocaine induced vasoconstriction of coronary arteries.</li> </ul>	<ul style="list-style-type: none"> <li>▪ In severe intoxication acute rhabdomyolysis may occur. This needs to be diagnosed urgently as there is a risk of renal failure.</li> <li>▪ Admit all the patients who present with chest pain after cocaine use. Risk is highest in the first hour after the use. Monitor with serial ECGs, cardiac enzymes and troponin levels at least 12 hrs.</li> <li>▪ Administer sublingual glyceryl trinitrate for chest pain and treat as for the myocardial infarction but note that</li> </ul>

<ul style="list-style-type: none"> <li>▪ Patients requiring parenteral benzodiazepines should be nursed in high dependency or ICU</li> <li>▪ A sedating antipsychotic agent (e.g. olanzapine or quetiapine)</li> <li>▪ Dialysis for rhabdomyolysis</li> <li>▪ Close Monitoring for depression and suicidality</li> <li>▪ Protection from risk of self-injury.</li> </ul>		<ul style="list-style-type: none"> <li>▪ Calcium channel blockers should also be avoided because of seizures.</li> </ul>	<p>cocaine has local anaesthetic effects.</p> <ul style="list-style-type: none"> <li>▪ Avoid beta blockers; also avoid aspirin if cerebral haemorrhage is suspected.</li> </ul>
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### **Management of Stimulant Withdrawal: Detoxification**

Patient education about withdrawal symptoms and their time course, and reassured that, if necessary, medication will be provided for any withdrawal symptoms; these symptoms will gradually resolve if they remain abstinent from stimulant use.

Setting for elective detoxification

Simple and uncomplicated stimulant withdrawals may be managed in a supportive home environment, where there is a live-in carer and a nurse and/or general practitioner able to visit daily. An alternative is ambulatory detoxification where, the patient visits the hospital/treatment centre or general practitioner on a daily basis. However, severely dependent patients with medical or psychiatric complications, or without a supportive home environment, are best managed in a detoxification unit or hospital setting.

The clinical features of stimulant withdrawal may be complicated by withdrawal from co-existing alcohol or other substance dependence because many psychostimulant users are polysubstance users (particularly alcohol; benzodiazepines or opioids). Supportive safe, quiet and non-threatening environment is essential for rest and sleep.

Other aspects of management:

- Adequate diet: because a significant component of the withdrawal syndrome is probably related to neurotransmitter depletion, recovery may be delayed because of anorexia associated with amphetamine use.

- It may be useful to provide some nutritional supplements or a well-balanced diet rich in monoamine precursors phenylalanine, tyrosine or L-tryptophan, e.g. pumpkin seeds, chocolate, marmite or vegemite, bananas.
- Short-term benzodiazepines may be prescribed for insomnia and agitation, e.g. diazepam 5-10 mg 3-4 times daily.
- If the patient is psychotic: olanzapine 10-20 mg daily.
- The 3 Ds technique may be helpful in managing cravings. This involves Delay the decision to use or not for 1 hr, distract yourself with some activity during this hour, and decide whether it is worth using after the hour is up
- It is important to treat co-morbid psychiatric disorders. Recognize that the combination of stimulant use and depression places the person at increased risk of suicide. Suicide risk assessment should be undertaken regularly if indicated.
- The role of antidepressants: the benefits of antidepressants in managing stimulant withdrawal symptoms are clearer where there is pre-existing depression and when administered 4-6 weeks following abstinence. Tricyclic antidepressants and SSRIs appear to have limited efficacy in reducing symptoms of depression in stimulant dependence unless there is co-morbid depression.
  - Tricyclic antidepressants may place the patient at risk of toxicity overdose if the patient is suicidal. Tricyclic antidepressants may cause CNS depression if combined with other antidepressants.
  - SSRIs may cause the serotonin syndrome if combined with stimulants.
- In the management of psychostimulant dependence, detoxification, and management of withdrawals is the first important step to ongoing pharmacological, psychological and social interventions in association with self-help programmes, life style changes, and residential care, if required

## **Management of stimulant dependence**

### Steps in the management of stimulant dependence

- Provision of information and education regarding stimulant use and its complications. This may include brief intervention and motivational interviewing.
- Let the patient digest the information provided and consider where they are at. The patient must then reach a point of acceptance of the need to stop and develop a commitment to stop stimulant use.

- Detoxification is a necessary first step for cessation of stimulant use and other drug use in polydrug users.
- Pharmacotherapy: To date, there are no widely accepted and evidence-based pharmacotherapy regimens for the treatment of stimulant dependence. There are several promising pharmacotherapies, which are described below. In addition, consider use of antidepressants for chronic co-morbid depression.
- Psychological treatment: This very important component of treatment includes brief advice, motivational interviewing, cognitive behavioural therapy (CBT), psychological counselling and behavioural therapy involving skills training and practice to deal with craving and high-risk situations associated with relapse, and contingency management is effective in preventing relapse. It may involve 1:1 individual counselling by skilled counsellors using standardized manuals or group drug counselling.
- Treatment of co-morbidity: parallel treatment of underlying physical, neuropsychiatric co-morbidity or complications. Consult a psychiatrist.
- Treatment of patient within the family and social context: Families of users require support, assistance and advice on how to deal with the user and how to access community services, mental health services and correctional services. Families also need information and advice on how to support and help the user.
- Self-help groups or mutual support groups based on 12-step fellowship (AA, NA) with abstinence as a goal. Weekly 12-step programmes are effective and patients who participate in both formal drug treatment and weekly 12-step programmes have higher rates of abstinence.
- Continual care: treatment is not just a brief one-off, follow-up and if necessary, residential care is important.
- Life style change: changes at work, home and environment.
- Pharmacological treatments under study: A variety of medication regimens are currently under study.
  - Long acting psychostimulant replacement therapy: including dexamphetamine, methylphenidate and phentermine. Small scale studies have shown that agonist substitution engages people in treatment and there are some early indications of benefit in terms of reduction of psychosocial harm and drug offences. Prescribing of psychostimulants as substitution agents is not possible in most countries, and in those where it can be undertaken special authorization is necessary.

- Disulfiram has been reported to reduce cocaine use. It acts as a central inhibitor of dopamine beta hydroxylase, causing an increase of dopamine and decreased synthesis of noradrenaline. As a result, it may attenuate the cocaine “high” causing a decreasing desire to use more cocaine.
- Modafinil is a non-stimulating alerting agent used in narcolepsy and other disorders of daytime excessive sleepiness. It is being tried as a substitute for ATS dependence as it has low abuse potential.
- Bupropion is an antidepressant that has a dopaminergic mode of action but has low abuse potential. As well as lifting depression, it also helps people stop smoking nicotine. It may help reduce cravings and provide some restoration of energy and drive in ATS withdrawal states

## **Conclusion**

Substance use disorder treatment in adolescents remains an enigma. There are multiple barriers to treatment are: an identified perceived lack of available and accessible treatment, barriers to care included the belief that treatment is not necessary, ambivalence or low motivation to change, fear of stigma, greater mental health problems, and desire for self-reliance.

The limited evidence that suggest only modest efficacy across treatments, clinicians should choose evidence-based interventions depending upon their familiarity with an intervention and feasibility of implementation to help optimize outcomes. It remains likely that different substance abusing adolescents may respond differently to different substance abuse treatments. Psychosocial interventions remain the mainstay of management despite high non-response and relapse rates (70%), with adjunct pharmacotherapy. Substance use disorders run a chronic course hence participation in aftercare services after undergoing a treatment schedule should be encouraged as it is related to improved outcomes.

In sum, treatment should be individualized, taking into consideration what the adolescent and family are able to do and trying to optimize outcomes by choosing among interventions. We need more research and understanding of how to serve adolescents encountered in a wide variety of settings including mental health centres, schools, hospitals and medical services, child maltreatment services, vocational training, and criminal justice programs. Future efforts should be aimed at developing economically-viable developmentally-sensitive prevention strategies that begin prior to the emergence of the criterion behaviour of substance use

disorders, i.e., prior to the middle school years and continue throughout the vulnerable periods of early and late adolescence.

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