

MEDICINE 438's REVIEW OF

CLINICAL PSYCHIATRY



Substance Abuse Disorders

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Objectives

- ◀ To understand basic etiology and pathophysiology of substance use disorders.
- ◀ To know the most common substances of abuse, their effects, and serious outcomes.
- ◀ To be able to conduct a general assessment for those suffering with substance use disorders.
- ◀ To be able to differentiate between different clinical presentations including concurrent disorders.
- ◀ To gain a basic understanding of the prognosis and management of substance abuse disorders.



EDITING FILE

Substance Use Disorders

◀ Introduction

- Many implications for brain research & clinical Psychiatry.
- Affect mental state and behavior.
- Symptoms similar to the psychiatric disorders.

◀ What is Addiction?

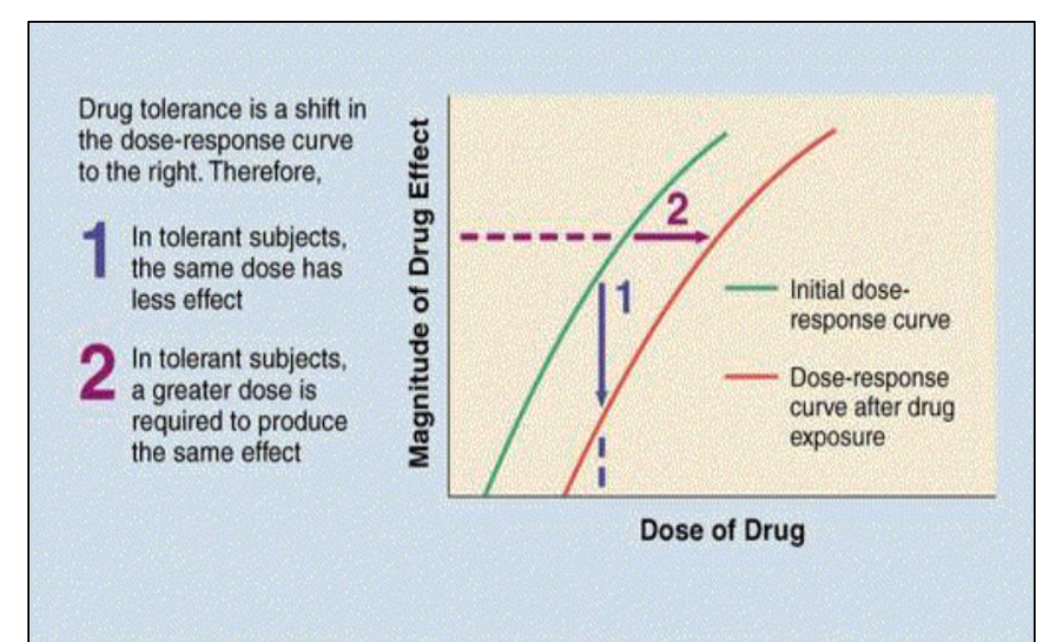
- In Aug 2011, The American Society of Addiction Medicine (ASAM) has officially recognized Addiction as mostly **a primary chronic brain problem**.
- **Genetic predisposition play an important role in addiction** (e.g., dopamine receptor mutations or aldehyde dehydrogenase polymorphisms in asians)
- Addiction is not a choice, but choice still plays an important role in getting help.

◀ Definitions

- **Abuse:** Self-administration of any substance in a culturally disapproved manner that causes adverse consequences.
- **Intoxication:** The transient effect (physical and psychological) due to recent substance ingestion, which disappears when the substance is eliminated.
- **Withdrawal:** a group of symptoms and signs occurring when the drug is withdrawn or reduced in amount.
- **Dependence:** The physiological state of neuroadaptation produced by repeated administration of a drug, necessitating continued administration to prevent appearance of withdrawal state.
- **Addiction:** A nonscientific term that implies dependence and associated deterioration of physical mental health as well as high tendency to relapse after discontinuation.

◀ Drug Tolerance

- The higher the dose the higher the effect of the drug.
- Initially, the individual will achieve the desired effect with lower dose (the green curve) but as he/she continue to ingest the drug, he/she will need higher dose to reach the same effect (the orange curve) “tolerance”.
- **Tolerance and withdrawal symptoms** are essential to diagnose someone with **dependence**.



Substance use disorders are characterized by a problematic pattern of substance use causing impairment or distress, as manifested by at least two of the following within a 12-month period:

- Using substance more than originally intended.
- Persistent desire or unsuccessful efforts to cut down on use.
- Significant time spent in obtaining, using, or recovering from substance.
- Craving to use substance.
- Failure to fulfill obligations at work, school, or home.
- Continued use despite social or interpersonal problems due to the substance use.
- Limiting social, occupational, or recreational activities because of substance use.
- Use in dangerous situations (e.g., driving a car).
- Continued use despite subsequent physical or psychological problem (e.g., drinking alcohol despite worsening liver problems).
- **Tolerance (needing higher amounts of the substance to achieve the desired effect or experiencing diminished effects when repeating the same dose).**
- **Withdrawal (a substance-specific syndrome occurring when a patient stops or reduces heavy/prolonged substance use).**

TABLE 15-1. DSM-5 substance-related and addictive disorders

Alcohol-related disorders
Alcohol use disorder
Alcohol intoxication
Alcohol withdrawal
Caffeine-related disorders
Caffeine intoxication
Caffeine withdrawal
Cannabis-related disorders
Cannabis use disorder
Cannabis intoxication
Cannabis withdrawal
Hallucinogen-related disorders
Phencyclidine use disorder
Other hallucinogen use disorder
Phencyclidine intoxication
Other hallucinogen intoxication
Hallucinogen persisting perception disorder
Inhalant-related disorders
Inhalant use disorder
Inhalant intoxication
Opioid-related disorders
Opioid use disorder
Opioid intoxication
Opioid withdrawal
Sedative, hypnotic, or anxiolytic-related disorders
Sedative, hypnotic, or anxiolytic use disorder
Sedative, hypnotic, or anxiolytic intoxication
Sedative, hypnotic, or anxiolytic withdrawal
Stimulant-related disorders
Stimulant use disorder
Stimulant intoxication
Stimulant withdrawal
Tobacco-related disorders
Tobacco use disorder
Tobacco withdrawal
Other (or unknown) substance-related disorders
Other (or unknown) substance-induced disorders
Non-substance-related disorders
Gambling disorder

Note that these criteria remain the same **regardless** of what substance(s) the patient is using.

◀ Basic Classifications

- CNS Suppressants: Alcohol – Sedatives – Inhalants – Opioids.
- CNS Stimulants: Amphetamine – Cocaine.
- Cannabis (**Marijuana**).

◀ Assessment

- **ABCDE**
- Collateral history, & **Examination**.
- Urine screening tests.
- Blood screening tests (alcohol, barbiturates).
- Pattern of Abuse:
 - **What?** (type, dose, route, effect: nature and duration).
 - **How?** (frequency, duration, how long, source, and situation).
 - **Why?** (Psychosocial problem).
 - **Dependence?**
- Complication:
 - Psychosocial.
 - Physical.
 - Social

Detection of Substance Abuse

Alcohol	<ul style="list-style-type: none"> • Stays in system for only a few hours. • Breathalyzer test, commonly used by law enforcement. • Blood/urine testing more accurate.
Cocaine	<ul style="list-style-type: none"> • Urine drug screen positive for 2–4 days.
Amphetamines	<ul style="list-style-type: none"> • Urine drug screen positive for 1–3 days. • Most assays have poor sensitivity and/or specificity.
Sedative-hypnotics	<ul style="list-style-type: none"> • Barbiturates: <ul style="list-style-type: none"> ○ Short-acting (pentobarbital): 24 hours ○ Long-acting (phenobarbital): 3 weeks • Benzodiazepines: <ul style="list-style-type: none"> ○ Short-acting (e.g., lorazepam): up to 5 days ○ Long-acting (diazepam): up to 30 days
Opioids	<ul style="list-style-type: none"> • Urine drug test remains positive for 1–3 days, depending on opioid used. • Methadone and oxycodone will come up negative on a general screen (order a separate panel).
Marijuana	<ul style="list-style-type: none"> • Urine detection: After a single use, about 3 days. In heavy users, up to 4 weeks (THC is released from adipose stores).

Alcohol & Related Mental Disorders

◀ WHO Report (Feb 2011)

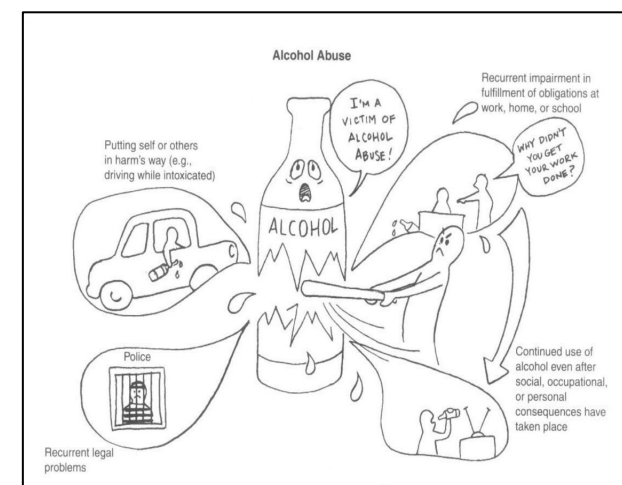
- Alcohol causes nearly 4% of deaths worldwide, more than AIDS, tuberculosis or violence.
- Alcohol is the world's leading risk factor for death among **males aged 15-59**.
- Alcohol is a causal factor in 60 types of diseases and injuries.

◀ Risk Factors of Alcohol Abuse

- Vulnerable personality: impulsive, gregarious, less conforming, isolated or avoidant persons.
- Vulnerable occupation: senior businessmen, journalists, doctors.
- Psychosocial stresses: social isolation, financial, occupational or academic difficulties, and marital conflicts.
- Emotional problems: anxiety, chronic insomnia, depression.
- **3-2:1 male to female ratio for alcohol use disorder**

◀ Alcohol Abuse

- Excessive consumption: harmful use.
- Problem drinking: drinking that has caused disability, but not dependence.
- Alcohol dependence: This usually denotes alcoholism.
- Alcohol-related disability: physical, mental and social.



◀ How Much is Too Much?

- **Vodka, tequila, whisky are hard liquor.**
- **Same amount of alcohol but different percentages.**



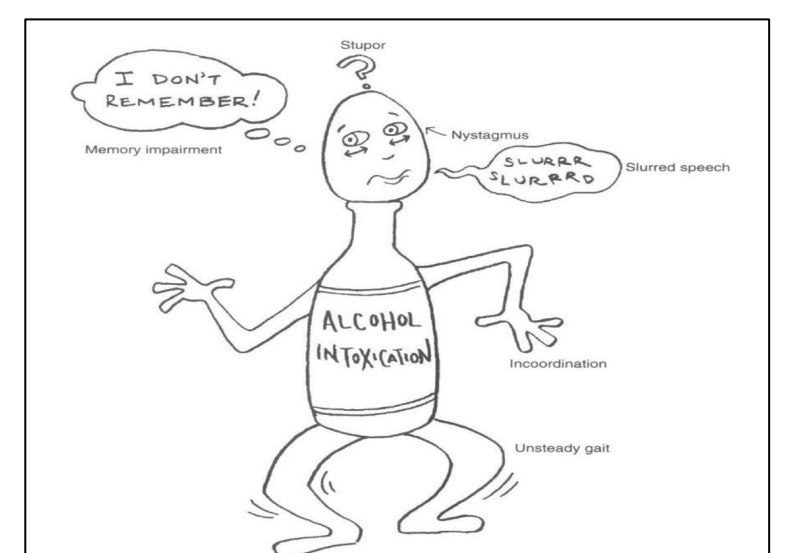
◀ Clinical Presentation

- **Alcoholism:** A non-diagnostic term that incorporates all forms of alcohol misuse
- **Alcohol use disorder:** A DSM-5 diagnosis, A problematic pattern of alcohol use leading to clinically significant impairment as manifested by [two or more symptoms out of a total of 12 in page 2], occurring within a 12-month period.
- **Alcohol dependence:** An ICD-10 and DSM-IV diagnosis.
- **Withdrawal and intoxication** symptoms refer to a cluster of features that can appear upon a substance misuse, either with or without a substance use disorder diagnosis
- **Arak = عرق = CNS depressant**
- **Alcohol Intoxication:**
 - Sense of well-being, emotional lability, irritability and incoordination > **with higher intake patient develop** ataxia and slurred speech (**cerebellar involvement**).
 - Heavy Intoxication (bl **>300 mg/ml**) > **alcoholic coma & death**.
 - Acute Intoxication may mimic:
 - Panic attacks.
 - Depression.
 - Acute psychosis with delusions +/- hallucinations.

Alcohol Intoxication Ethanol Plasma Concentration Vs CNS Effects	
Plasma Concentration (mg/dl)	Impairment
-	Feeling of relaxation, euphoria
20-30	Slowed thinking
30-80	Motor incoordination
80-200	Cognition, judgement, lability
200-300 (cerebellar involvement)	Slurring, ataxia, nystagmus, blackouts (patient can't remember what was he doing when he was drinking)
>300	Vital signs, coma, possible death due to the respiratory failure

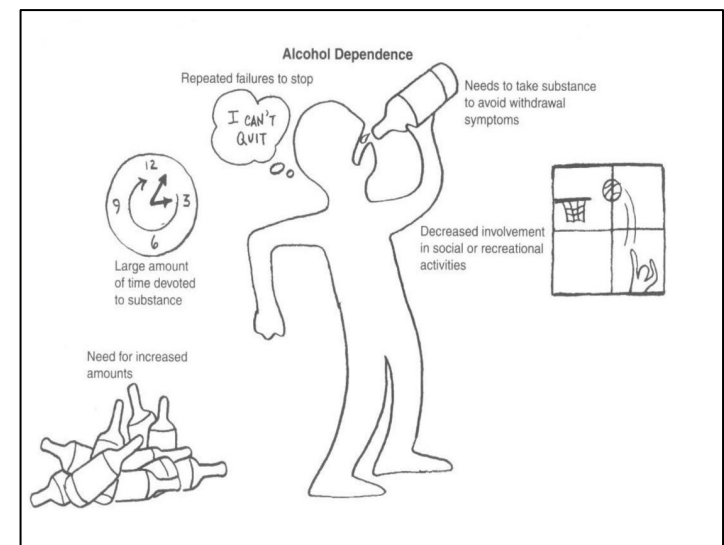
If the impairments do not develop at the above plasma concentrations then this may indicate tolerance or less often, a hypersensitivity

- **Alcohol withdrawal:**
 - Sx may begin after 6 hours of cessation peak by 48 hours.
 - Sx subside over the course of 5-7 days.
 - **Epileptic generalized tonic clonic seizures** may develop **within 12-24 hours** after cessation of alcohol intake.
 - **Delirium tremens** may develop **after about 48 hours**.



◀ Alcohol Dependence

- 15-20 years before evident. As they don't start drinking in high amount so it take time before dependence develop.
- Dependence is most common in those aged 40 – 55 years.
- Alcoholics who continue drinking have a shortened life-span of 15 years why? Mainly due to complication (Medical, Fights, Overdose, Suicide).



Complication Of Chronic Alcohol Abuse		
Medical	Psychological	Social
<ul style="list-style-type: none"> ● Neurological. ● Cerebral degeneration. ● Seizures. ● Peripheral neuropathy (stocking and glove) ● Optic nerve atrophy. ● Alimentary Tumors (mouth, tongue, esophagus, liver, pancreas). ● Gastritis, peptic ulcer. ● Pancreatitis. ● Hepatitis, liver cirrhosis. ● Cardiomyopathy. ● Anemia. ● Gynaecomastia, testicular atrophy, female escutcheon (pubic hair pattern) in men 	<ul style="list-style-type: none"> ● Amnestic disorder. ● Delirium. ● Dementia. ● Psychosis. ● Depression. ● Reduced sexual desire. ● Insomnia ● Personality deterioration. ● Increased risk of suicide. ● Morbid jealousy. preoccupation with a partner's sexual unfaithfulness (delusions). ● Confabulation 	<ul style="list-style-type: none"> ● Social isolation. ● Job loss. ● Marital conflicts. ● Family problems. ● Legal troubles. ● Social stigma.

How does withdrawal occur?

- Within 6 h from stopping or decreasing the dose withdrawal happens.
 - Peak withdrawal state is reached after 2 days.
 - After that blood concentration starts declining and the patients situation improves.
 - However withdrawal can take up to a week. Therefore if a patient came with symptoms of withdrawal we don't discharge them after 2 days, we must wait.
-
- What brings them to our care? Most likely they had a seizure, stopped suddenly, or had little or more than usual.
 - If they overdosed they may present with coma. (more common)
 - Delirium tremens may occur 2 , 3 or 5 days after presentation. Therefore if the patient improved after 2 days we cannot discharge them just yet as delirium tremens remains a potential risk.

◀ Screening- CAGE Questionnaire

- Have you ever:
 1. Wanted to Cut down on your drinking?
 2. Felt Annoyed by criticism of your drinking?
 3. Felt Guilty about drinking?
 4. Take a drink as an “Eye-opener” (“أول ما يصحى على الريق”) to prevent the shakes?
- If the patient answered **YES** to **TWO** or more question then he is **Heavy drinker**.

◀ Laboratory Tests

- Identify acute and/or heavy drinking (≥ 5 drinks/day):
 - Blood Alcohol Levels (BAL).
 - Gamma-glutamyltransferase (GGTP > 35 IU/L)(early sign of misuse)
 - Erythrocyte mean corpuscular volume (MCV $> 91.5 \mu 3$). **Hypochromic macrocytic anemia** or microcytic (e.g., sideroblastic anemia)
 - High AST/ALT.

◀ Treatment

Treating Alcohol Intoxication

- Unconscious: ABCs.
- Conscious: supportive, antipsychotic if agitated.
- **Gastric lavage** if a significant amount was ingested within **30-60 minutes**

Treating Alcohol Withdrawal

- Supportive
- **Thiamine (B1)**, folic acid (B9), pyridoxine (B6), to prevent wernicke and korsakoff syndromes caused by vitamin B1 deficiency
- **Long acting BDZ** (e.g., chlordiazepoxide) (for seizure) \pm anticonvulsants (e.g., diazepam) for seizure.
- Intermediate or short-acting benzodiazepines (e.g., oxazepam, lorazepam) are preferred in **elderly patients** and those with **liver damage** (lorazepam, oxazepam and temazepam are the **RENALLY** metabolized BZDs)
- **Alcoholic hallucinosis**: Hallucinations within 48hrs withdrawal, treated with **antipsychotics** (e.g., haloperidol, risperidone)
- **Delirium tremens**: next page

Maintaining Abstinence (Rehabilitation)

- **Naloxone (per textbook; naltrexone [first-line])**: reduces alcohol-induced reward (contraindicated in severe liver damage)
- **Acamprosate (glutamate modulator, [first-line in patients with liver damage])**: anti-craving effects (contraindicated in severe renal damage)
- **Disulfiram (second-line)**: blockade of aldehyde-dehydrogenase \rightarrow accumulation of acetaldehyde- nausea, flushing, tachycardia, hyperventilation, panic. **The patient take pill in the morning and if he drank alcohol later it will cause severe reaction which help to stop the drinking (negative reinforcement or more correctly, positive punishment)(Requires optimal patient cooperation)**
- **SSRIs** for people who remain depressed 2-4 weeks following abstinence

Psychological

- Individual, group Rx (alcoholics anonymous), relapse prevention.

	Naltrexone	Naloxone
Chemical Formula	C ₁₇ H ₁₉ NO ₂	C ₁₅ H ₁₇ NO ₂
Oral Bioavailability	Up to 40%	2% (high absorption but extensive first-pass metabolism)
Metabolism	Hepatic	Hepatic
Peak Concentration	1-2 hours	10 minutes
Half-life	Up to 14 hrs (oral)	30-81 min. (IV, IM)
Duration of Action	Up to 24+ hrs	1-4 hrs
Excretion	Renal	Renal, Biliary

◀ Alcoholic Ketoacidosis

- Alcohol cessation in the setting of severe vomiting and lack of oral intake
 - Characterized by a high-anion gap metabolic acidosis
 - **Hallmark is ketosis without hyperglycemia**
 - Low levels of potassium, magnesium and phosphorus
 - Treat with D5NS and electrolytes as needed

Delirium Tremens (DTS)

◀ Introduction

- **Severe form of alcohol withdrawal after 2-3 days (>24 hrs):**
 - Gradual onset of delirium and gross tremors.
 - If a patient present to the ER due to accident and on assessment you find out that he drink alcohol then he should not be discharged within the next 48 hours to make sure that DTS and Seizure are prevented.
 - **A classical scenario in MCQs: A patient found delirious several days after hospitalization due to cessation of alcohol intake.**
- Other features:
 - Autonomic disturbance.
 - Dehydration and electrolyte disturbance.
 - Insomnia.
- Peaks on 3rd or 4th day.
- Lasts 3-5 days.
- Worse at night and followed by a period of prolonged deep sleep after which the patient has amnesia.

◀ Complications

- Violent behavior.
- Seizures (chest infection & aspiration).
- Coma.
- Death (mortality rate: 5-15%).

◀ Causes

- Volume depletion.
- Cardiac arrhythmias.
- Electrolyte imbalance.
- Infections.

◀ Treatment

DT is a serious MEDICAL emergency! detection and treatment – **ICU** or medical ward.

- **Avoid antipsychotics** (except in one withdrawal state; hallucinosis). In delirium caused by medical conditions we usually give antipsychotics, but avoid them in alcohol induced delirium because they **increase the risk of seizure by decreasing the threshold.**
- **Guard against seizures** (IV diazepam followed by lorazepam every 5-15 minutes until stabilized)
- **Rehydration.**
- **Thiamine (B1)** and folic acid (B9)
- Adjust surroundings **with physical restraints if necessary**

Sedatives, Hypnotics & Anxiolytics

◀ Introduction

- Similar clinical manifestations and withdrawal to alcohol.
- Barbiturate (not used anymore because of low therapeutic index), benzodiazepine (diazepam, lorazepam clonazepam “ROCHE-2 روش ۲”, alprazolam “xanax” highly abused)
- Risk of cross-tolerance and cross-dependence. If someone is dependent on alcohol then he will be dependent to sedatives, hypnotics and anxiolytics (cross dependence), and also if the person need increasing amount of alcohol to prevent withdrawal symptoms then he will also need higher amount of sedatives, hypnotics and anxiolytics (cross tolerance).
- Withdrawal depends on substance.
- BDZ have a large margin of safety & less addiction potentials.
- **Flumazenil** is a BDZ receptor antagonists used in BDZ overdose. Used in the ER.

Presentation	Treatment
Sedative-Hypnotics Intoxication	
<ul style="list-style-type: none"> • Drowsiness. • Confusion. • Hypotension • Slurred speech. • Incoordination. • Ataxia • Mood lability. • Impaired judgment. • Nystagmus. • Respiratory depression. • Coma or death in overdose. • Long-term sedative use may lead to dependence and may cause depressive symptoms. 	<ul style="list-style-type: none"> • ABC. • Activated charcoal and gastric lavage to prevent further gastrointestinal absorption (if drug was ingested in the prior 4–6 hours). • For barbiturates only: Alkalinize urine with sodium bicarbonate to promote renal excretion. • For benzodiazepines only: Flumazenil in overdose. • Supportive care—improve respiratory status, control hypotension.
Sedative-Hypnotics Withdrawal	
<ul style="list-style-type: none"> • Signs and symptoms of withdrawal are the same as these of EtOH withdrawal. • Tonic-clonic seizures may occur and can be life threatening. 	<ul style="list-style-type: none"> • Benzodiazepines (stabilize patient, then taper gradually). • Carbamazepine or valproic acid taper not as beneficial.

Opioids

◀ Introduction

- Naturally occurring (e.g. opium, codeine), synthetic or semi-synthetic.
- Medically used as analgesics, anesthetics, antidiarrheal agents (e.g., loperamide) and cough suppressants (e.g., dextromethorphan)
- Medical use (e.g. Pethidine) give powerful analgesic effect.
- Substance of abuse (e.g. Heroin).
- Abused for **euphoriant effect**.
- Opioid intoxication is more serious than opioid or alcohol withdrawal because of respiratory depression.
- Alcohol withdrawal is more dangerous than opioid withdrawal because of seizure and DTS.
- Examples: Opium, heroin, morphine, codeine, pethidine, methadone, tramadol, oxycodone, meperidine (long acting opioid given to patient with heroin addiction).

Opioid Intoxication	
Presentation	Treatment
<ul style="list-style-type: none"> ● Euphoria. ● Relaxation. ● Analgesia. ● Disturbed consciousness. ● Small pupil (initially). Pin-point pupil (except meperidine) ● Bradycardia. ● Reduced appetite. ● Constipation. ● Respiratory depression. 	<ul style="list-style-type: none"> ● ICU: <ul style="list-style-type: none"> ○ Open airway – oxygen – IV fluids. ○ Monitoring. ○ Naloxone. Antidote. ○ Anticonvulsants (e.g., diazepam) for seizures ○ Naltrexone to prevent later relapse

Opioid Withdrawal	
Presentation	Treatment
<ol style="list-style-type: none"> 1. Lacrimation, rhinorrhea & yawning. 2. Dysphoric mood. 3. Insomnia. 4. Muscle and joint aches. 5. Cold and hot flashes. 6. Nausea, vomiting and diarrhea. 7. Fever, sweating, piloerection. 	<ul style="list-style-type: none"> ● Short-term: Symptomatic. <ul style="list-style-type: none"> ● Painkillers, sedatives, observation. ● Clonidine (suppresses autonomic signs) ● Long-term: <ul style="list-style-type: none"> ● Harm reduction strategies. ● Methadone. ● Buprenorphine/Naloxone. ● Muscle aches and pain: NSAIDs ● GIT disturbances: dicyclomine (anticholinergic)
<ul style="list-style-type: none"> ● Intense craving begins 6 hours after the last dose and peaks after 36-48 hours. ● Untreated withdrawal result in no serious medical sequelae - but they cause great distress. ● Tolerance can develop very rapidly (esp. in IV use) leading to increasing dosage - then it diminishes very rapidly. If someone get treated of the addiction and after a while suddenly develop relapse and take the same last dose it will lead to overdose. 	

Inhalants

◀ A Case Scenario

- Aadeb is a **16 year old** boy who lives with his divorced mother. He presented with slurred speech, **facial rashes**, incoordination and nausea.

◀ Introduction

- Volatile organic substances –acetone, benzene, **toluene** etc.
- Brain depressants.
- Adolescents – experimentations (cheapest and most accessible)
- **Most commonly used by preadolescents or adolescents.**
- Intoxication – similar to other brain suppressants.
- Complications:
 - Physical: **Multiple organ damages**

- Long-term use may cause permanent damage to CNS (e.g., neurocognitive impairment, cerebellar dysfunction, Parkinsonism, seizures), peripheral neuropathy, myopathy, aplastic anemia, malignancy, metabolic acidosis, urinary calculi, glomerulonephritis, myocarditis, myocardial infarction, and hepatotoxicity.
- A withdrawal syndrome does not usually occur, but symptoms may include irritability, sleep disturbance, anxiety, depression, nausea, vomiting, and craving.

Psychostimulants

◀ A Case Scenario

- Rakan is a 20-year old male brought to the ER by police who arrested him because of **reckless** driving (drifting with high speed) and violent behavior. He looked **over-suspicious, agitated, and over-talkative**.

◀ Commonly Used Stimulants

- Nicotine.
- Caffeine.
- **Cocaine** – Freebase/crack.
- **Amphetamine/Methamphetamine**.
- Methylenedioxymethamphetamine (MDMA) “**ecstasy**” used in dance clubs.
- Appetite suppressants (e.g. phentermine and diethylpropion).

◀ Psychological Factors of Non-Dependent Use

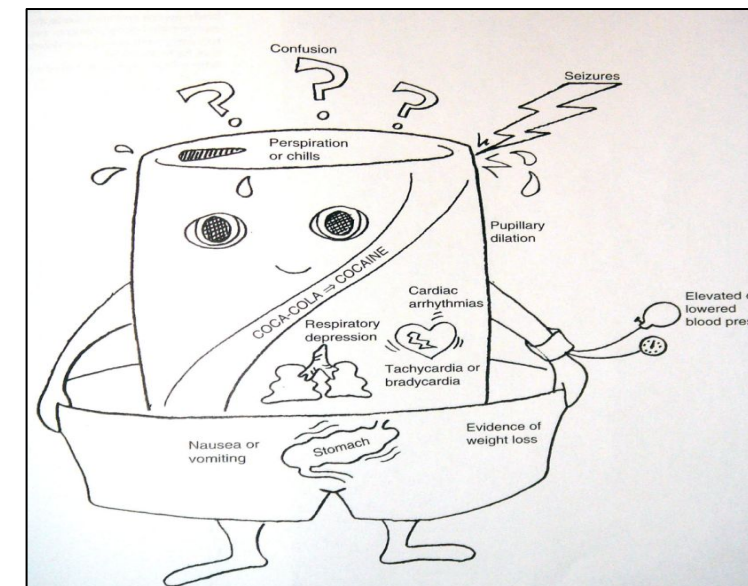
- Recurrent intoxication. **due to short half life**.
- Some users may self-medicate with antidepressants and/or benzodiazepines to **decrease the effect of the drug**.
- **After-Effects: termed ‘crash’ or ‘come down’**
 - Dysphoria.
 - Depressed mood.
 - Anxiety.
 - Reduced appetite.
 - Restlessness.

Clinical Effect of Stimulants

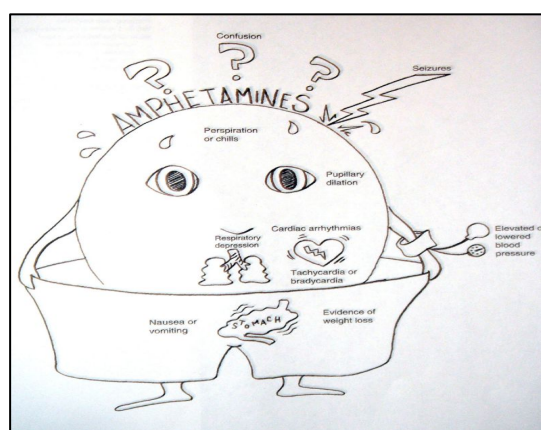
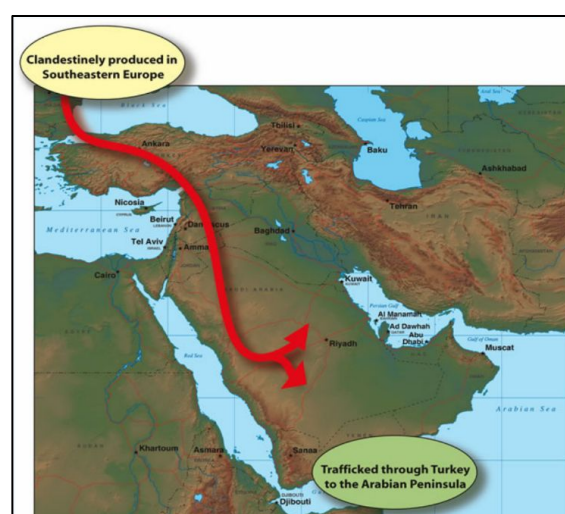
Psychological	Physical
<ul style="list-style-type: none"> ● Enhanced cognitive function. ● Elevated mood. ● Over activity. ● Increased confidence, self-esteem and sociability. ● Over Talkativeness. ● Insomnia. ● In high doses/prolonged use: <ul style="list-style-type: none"> ○ Restlessness, irritability. ○ Paranoid psychosis. ○ Hallucinations (visual). ○ Aggressiveness, hostility. 	<ul style="list-style-type: none"> ● Reduced sense of fatigue. ● Reduced appetite (anorexia). Used by models. ● Dilated pupils. ● Tremors. ● In high doses/prolonged use: <ul style="list-style-type: none"> ○ Nausea, vomiting, hyperthermia, cardiac arrhythmias, severe hypertension, CVA, seizures, Dizziness, respiratory distress.

◀ Cocaine

- Forms of cocaine:
 - Free base **smoking**.
 - Crack.
- Routes of use:
 - Intranasal “**more expensive > high socioeconomic status**”.
 - Intravenous/SC “**low socioeconomic status**”.



◀ Captagon (Fenethylline)



◀ Nicotine

- Stimulates nicotinic receptors on autonomic ganglia
- May cause restlessness, anxiety and an increase of GI motility
- Withdrawal begins **one hour** after the last cigarette and **peaks after 24hrs**
 - Features include; intense craving, decreased heart rate, restlessness and irritability
 - Later on; depression and weight gain may develop

Treatment

- **Nicotine transdermal patches**, gum or lozenges
- **Bupropion**: NE and dopamine reuptake inhibitor
- **Varenicline**: a partial agonist of nicotinic receptors (perhaps the most effective)
- Medications may sometimes be combined with other means (e.g., patches)

◀ Caffeine

- Main mechanism of action: an adenosine receptor antagonist
 - Adenosine is a CNS depressant
 - Adenosine inhibits the release of catecholamines (hence the sympathomimetic effect of caffeine)
- The most commonly used psychostimulant in the world
- The most potent source is coffee. Tea, chocolate, soft drinks and some analgesics (panadol extra) may also contain caffeine
- Not a DSM-5 disorder
- Mild stimulant effects start at 50-150mg of caffeine: increased alertness, motor and verbal performance (one shot of starbucks espresso approximately contains 75mg of caffeine)
- 250mg of caffeine: Anxiety, muscle twitching, diuresis and tachycardia
- More than 1g (e.g., >3 cold brews a day): Tinnitus, light flashes and possibly arrhythmia
- More than 10g: Seizures and respiratory failure may occur, followed by death
- Withdrawal (50-75% of users if caffeine is suddenly stopped): headache, fatigue, nausea and irritability, resolves within 1-2 weeks (e.g., Ramadan mornings)

Intoxication is treated through supportive measures and by gradually removing caffeine from diet (e.g., decaffeinated coffee or soft drinks)

Hallucinogens

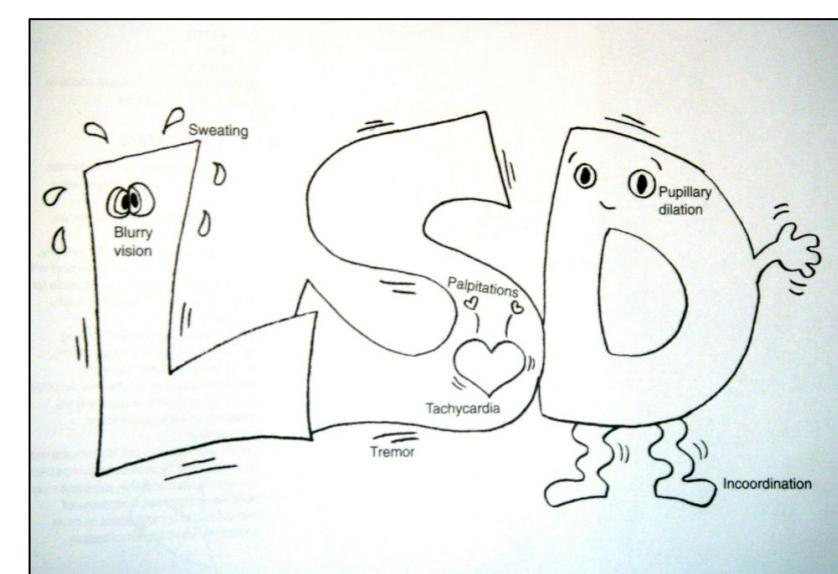
◀ Introduction

- These are group of substances that induce hallucination and produce loss of contact with reality.
- Natural and synthetic substances that are also called psychedelics or psychotomimetics.
- Natural e.g. psilocybin (magic mushroom) or synthetic like lysergic acid diethylamide (**LSD**).
- They are sympathomimetics
- No medical use and **high abuse potential**.
- The only substance that don't cause dependence.

Clinical Effect of Hallucinogen	
Psychological	Physical
<ul style="list-style-type: none"> ● Marked perceptual distortion (changing shapes and colors). ● Hallucination (visual and tactile). ● False sense of achievement and strength, a sensation of being closer to God. ● Euphoria or anxiety and panic (bad trips) ● Paranoid ideation. ● Homicide and suicide tendencies. ● Flashbacks (if after withdrawal; hallucinogen persisting perception disorder) ● Delirium. 	<ul style="list-style-type: none"> ● Tachycardia. ● Hypertension. ● Cerebellar signs. ● Wide pupils. ● Hyperemic conjunctiva. ● Blurred vision. ● Hyperthermia.

◀ Effects of LSD

- Effects of drug come on in about 30 min.
- First signs are autonomic activation.
- Followed by overt behavioral signs - loosening of emotional inhibitions.
 - Giddiness; laughter for no reason.
 - Mood euphoric and expansive, but labile mood swings notable.
- Abnormal color sensations, luminescence.
- **See the sound and listen to the color "synesthesia"**.
- Colors reported as more brilliant.
- Space and time disorders.
- Added depth with loss of perspective - up/down Altered.
- Close in space influenced more than distant.
- General **slowing of time** reported.



◀ Tolerance/Dependence

- **Not significant producers of tolerance or dependence "no addiction"**.
- No withdrawal either.
- **Problems related to the things people do while under the influence:**
 - Accidents, Suicide, Aggression/violence, Toxic reactions.

◀ Treatment

- Monitor for dangerous behavior and reassure patient. Use **benzodiazepines as first-line for agitation** (can use antipsychotics if needed).
- **Antipsychotics** in severe cases
- **Phentolamine** to reduce blood pressure
- **Ammonium chloride** to acidify the urine (rarely necessary)

New Psychoactive Substances (NPS) & Cannabis

◀ New Psychoactive Substances (NPS)

- Variable quantity and potency (up to 10,000 x morphine).
- Synthetic material with potency higher than from the natural substances
- Synthetic Cathinones same substance in قات.
- Synthetic Cannabis.
- Synthetic Benzodiazepines.

Cannabis

◀ A Case Scenario

- Bandar is a 32-year old male brought to outpatient clinic by his wife because of recurrent periods of being **over-suspicious, euphoric, and talkative**. He admitted abusing cannabis in the weekends.

◀ Introduction

- Cannabis - Marijuana, Hashish, Hash oil, Hemp.
- Cannabis sativa:
 - Psychoactive cannabinoids, Delta-9-tetrahydrocannabinol (delta 9-THC) is most abundant.
 - From flowering tops of the plants or from the dried, black- brown, resinous exudates from the leaves (hashish).
- Common names: marijuana, grass, pot, weed, tea, and Mary Jane.

◀ Outcome of Marijuana

- About 10% of all users will become dependent.
- About 40% of heavy users will become dependent.
- On average - using for 10 years and tried to quit 6 times.
- Great comorbidity - especially with adolescents.
- With increased comorbidity - worse prognosis.
- Note: Hashish is 5-10 times more potent than marijuana.

◀ Screening “Four Cs” Test (Not Important)

1. **Compulsion:** intensity over thoughts, feelings and judgement.
2. **Control:** controlling chemical use after starting.
3. **Cutting down:** effects of reducing.
4. **Consequences:** denial or acceptance of damage.

◀ Marijuana Intoxication

- Subjective quickening of associations and euphoria.
- Relaxation, decreased motor activity, sense of calm.
- Intense influx of sensory information.
- Diminished sensory gating, users avoid strong stimuli, synesthesia (see the sound, listen to the color) (Iverson 2008).
- Followed by a coming-down phase - cravings to sweet and salty foods - social withdrawn (Iverson 2008).
- Any substance increase the level of dopamine in the brain will leads to dependence (dopamine is the pleasure neurotransmitter in the brain).

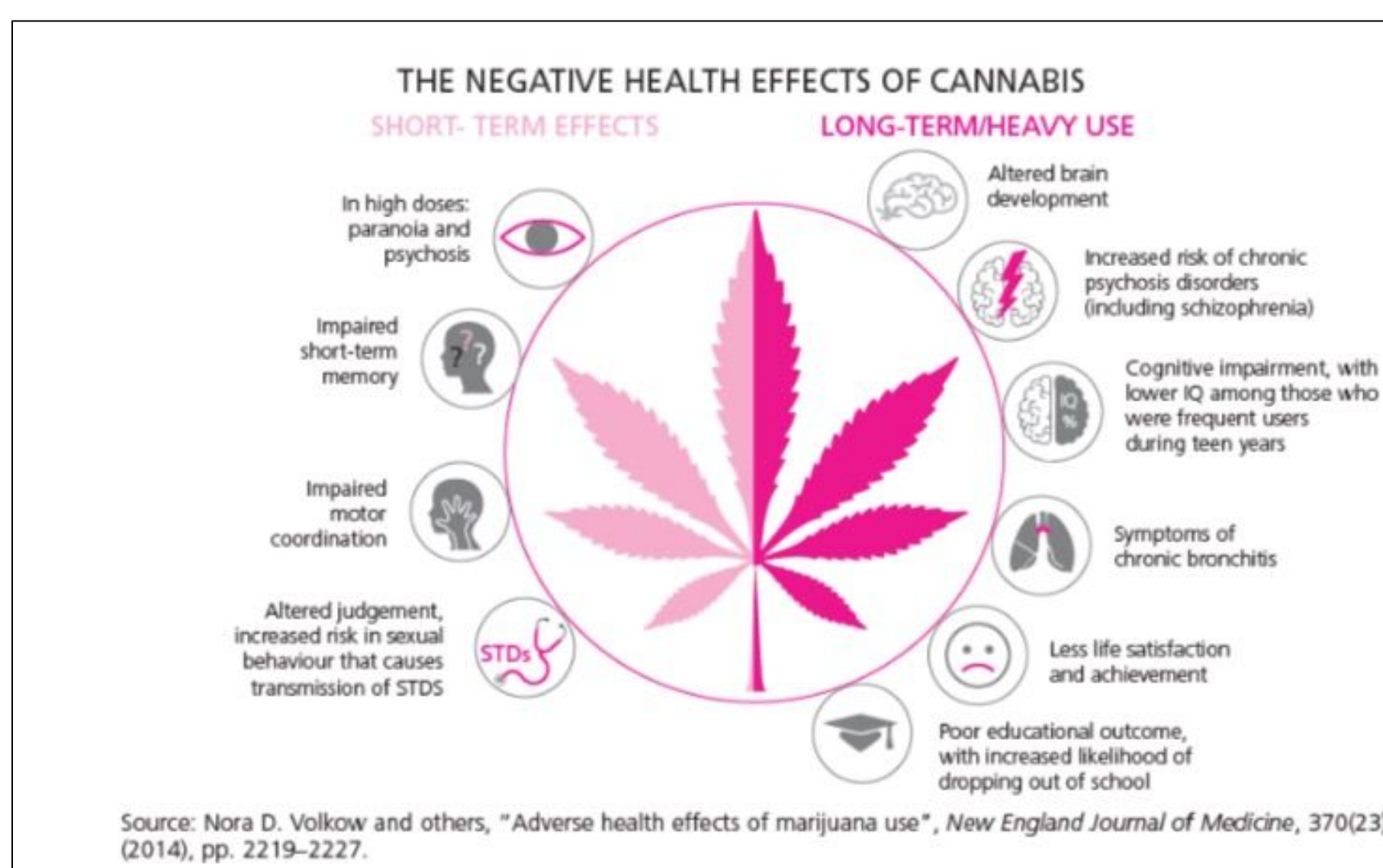
How Does It Affect Our Body?

Acute Effect	Effect on Physical Health
<ul style="list-style-type: none"> ● When smoked, euphoric effects appear within minutes, peak in about 30 minutes, and last 2 to 4 hours. ● If ingested, short term effects begin more slowly, usually 0.5 to 1 hr. ● After few min. heart begins beating, the bronchial passages relax and became enlarged, and the blood vessels in the eyes look red. ● THC activates the reward system - releasing dopamine. ● A pleasant sensation, color and sounds may seem more intense, and time appears to pass very slowly, mouth feels dry and he or she become very hungry and thirsty. ● THC disrupts coordination and balance. ● Anxiety +/- panic attacks. ● High doses may cause acute toxic psychosis. ● Amotivational syndrome. 	<ul style="list-style-type: none"> ● Increases difficulty in trying to quit smoking tobacco. ● Red eyes, tachycardia. At high doses: orthostatic hypotension, increased appetite & dry mouth. ● Heavy users are at risk for chronic respiratory disease. ● Also associated with: cerebral atrophy, seizure susceptibility, chromosomal damage, birth defects, impaired immune reactivity, alterations in testosterone conc. & dysregulation of menstrual cycles. ● Same carcinogenic hydrocarbons in conventional tobacco.

◀ Treatment of Cannabis

- Same principles as Rx of other substances of abuse- abstinence and support.
- **Education is cornerstone** for both abstinence & support.
- Support through individual, family, and group psychotherapies.
- Antipsychotic medication.
- Anti-anxiety/antidepressant drug may be useful.

◀ Summary of The Effects of Cannabis



◀ Injection Complications

- Bacterial, local and systemic.
- Blood-borne viruses. **HIV, hepatitis B&C.**
- Vascular damage.
- Track marks.
- Early cellulitis.
- Multiple injections over a short period suggests cocaine use. **"due to short half-life".**



Doctor's Quiz

1. A 41-year-old businessman came to the emergency department complaining of insomnia for 3 days after he ran short of his sleeping pills. He was asking for a specific drug manufactured by ROCHE Company. He knows that each tablet is 2 mg. He said he uses 5 tablets each night to sleep. The most likely problem of this patient is:
 - a) Heroin abuse.
 - b) Benzodiazepines abuse.
 - c) Methadone abuse.
 - d) Abuse of painkillers.
- 2) A 33-year-old single man was caught by police officers and put in prison because he was driving his car recklessly with high speed at 3am in the highway. Next day he started to show excessive lacrimation, runny nose, repeated vomiting, and abdominal cramps. However, his consciousness was intact. The most likely problem of this patient is:
 - a) Cannabis abuse.
 - b) Methadone intoxication.
 - c) Abuse of naloxone.
 - d) Opioid withdrawal.
- 3) A 32-year-old man became increasingly irritable, insomniac, hypervigilant for the past 4 weeks with unpredictable mood and accusing his wife with extramarital sexual relationships. The most likely diagnosis is:
 - a) Heroin abuse.
 - b) Generalized anxiety disorder.
 - c) Amphetamine abuse.
 - d) Paranoid Schizophrenia.
- 4) A 43-year-old man has episodic behavioral disturbances including; euphoria, talkativeness, and disinhibition. His eyes look red most of the time. The most likely diagnosis is:
 - a) Alcohol abuse.
 - b) Cannabis abuse.
 - c) Amphetamine abuse.
 - d) Cocaine abuse.
- 5) A 16-year-old boy presented with slurred speech, incoordination and nausea. Physical examination revealed facial rashes around his mouth and nose. When asked about substance abuse his reply was affirmative. The most likely substance is:
 - a) Cannabis.
 - b) Alcohol.
 - c) Volatile substance.
 - d) Morphine.

Answer Key: 1) B, 2) D, 3) C, 4) B, 5) C

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