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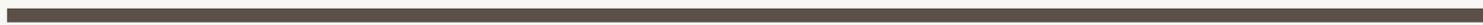
Substance Use Disorder

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Introduction

Definition :

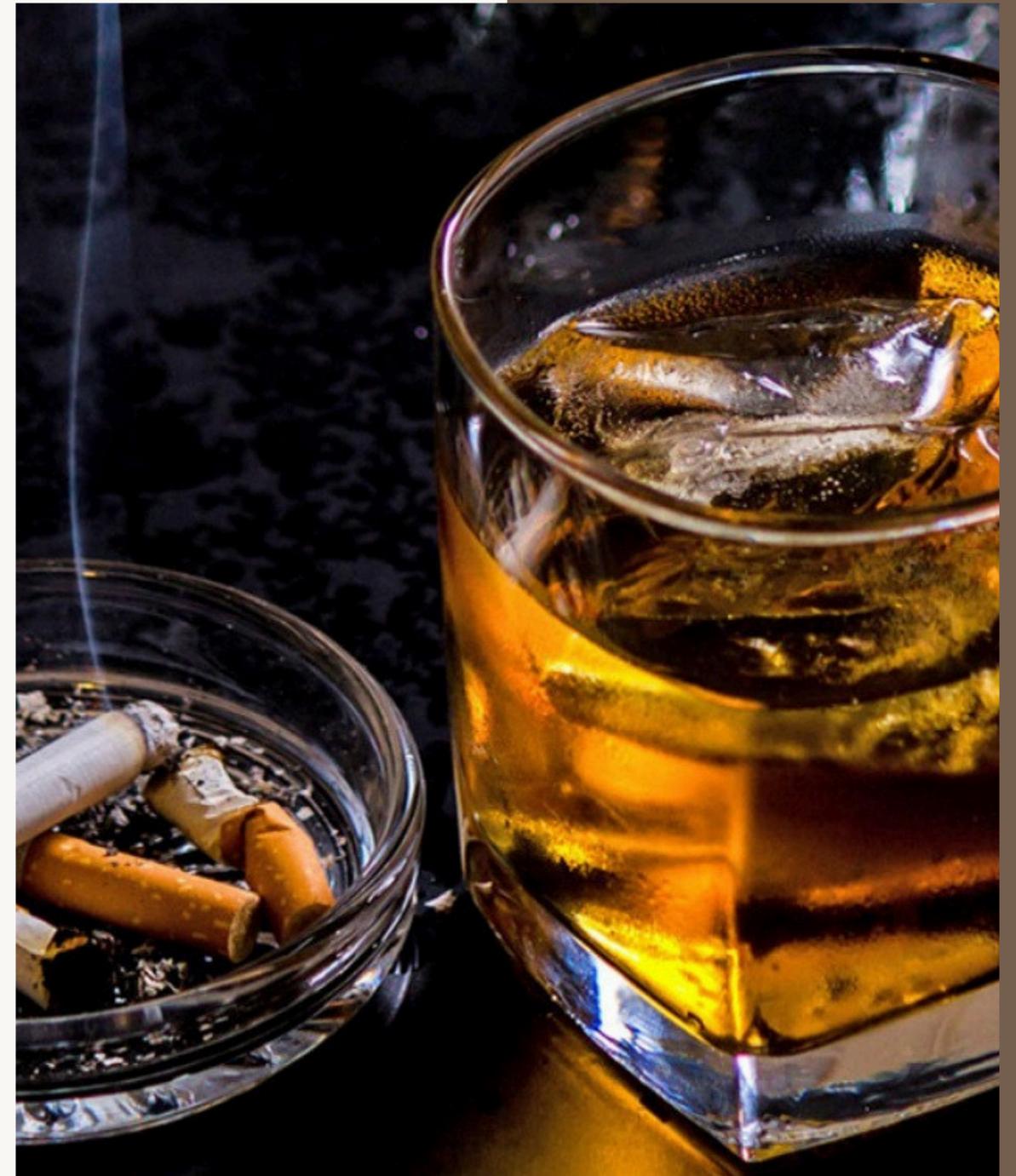
Uncontrolled pattern of substance use leads to significant physical, psychological, and social impairment or distress, with continued use despite substance-related problems.

Epidemiology:

Alcohol and nicotine use are **most common**.

In Jordan: Nicotine is the **most common**

Sex: ♂ > ♀



Psychiatric symptoms

- Mood symptoms are common among persons with substance use disorders.
- Psychotic symptoms may occur with some substances.
- Personality disorders and psychiatric comorbidities (e.g., major depression, anxiety disorders) are common among persons with substance use disorders.
- It is often challenging to decide whether psychiatric symptoms are primary or substance-induced

Risk Factors

Environmental:

- Using the substance at an early age, or experiencing physical, sexual, or emotional abuse.
- Social and legal policies.
- Acceptability.

Genetic predisposition:

These include a family history of substance use disorder or having a mental health disorder like depression, ADHD.

Peer factors:

- Substance uses during birthday or party.
- Excessive time spending with substance using peers.



Types of Substances



Depressants	Stimulants	Hallucinogens
<ul style="list-style-type: none">▪ Alcohol▪ Barbiturates▪ Benzodiazepines▪ Opioids▪ Inhalants	<ul style="list-style-type: none">▪ Amphetamines▪ Caffeine▪ Cocaine▪ Nicotine	<ul style="list-style-type: none">▪ Lysergic acid diethylamide▪ Cannabis▪ MDMA▪ Phencyclidine



Hallucinogens: These drugs alter the user's state of consciousness. (Distort auditory and visual sensation)

Important Definitions

Addiction :

- The repeated and increased use of a substance, which gives rise to symptoms of distress and irresistible urge to use the agent again which leads to physical and mental deterioration (refers to the inability to control the use of drugs or alcohol).

Intoxication :

- A temporary condition caused by under influence of a substance that make a specific mix of sign and symptoms

Tolerance:

- The need to continuously increase the dose of a substance to achieve the same desired effect.

Withdrawl:

- Acondition characterized by behavioral, physiological, and cognitive changes caused by a sudden reduction or cessation of substance intake after a prolonged period of heavy intake; usually occurs in association with substance use
→dis Oorfdteenrs, withdrawal symptoms are the opposite of intoxication effects

Brain Reward System

Core Structures:

- VTA, Nucleus Accumbens, Prefrontal Cortex, Amygdala, Hippocampus

Neurotransmitter:

- Dopamine is the key mediator of reward, pleasure, motivation, and reinforcement.

Function:

- Activated by natural rewards (food, sex) and drugs of abuse → learning & memory of rewarding stimuli
- Drives addiction: brain learns to repeat behavior that releases dopamine.

Clinical Relevance:

- Maladaptation of this system leads to substance use disorders, craving, and relapse.

How Euphoria is induced in the brain

Mechanism:

- Drugs of abuse (e.g., heroin, cocaine, alcohol, nicotine) increase dopamine in the mesolimbic pathway.

Key Pathway:

- Ventral tegmental area (VTA) → Nucleus accumbens (NAc) via dopaminergic neurons
- NAc = brain's "pleasure center" → reinforces drug use

Examples:

- Opioids: Bind to mu-receptors → inhibit GABA → disinhibition of dopamine neurons
- Cocaine: Blocks dopamine reuptake
- Nicotine: Stimulates nicotinic ACh receptors → ↑ dopamine

Diagnosis

(≥ 2 features must occur within 1 year to fulfill the DSM-V criteria).

Impaired control:

- - 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.

Social impairment:

- - 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.

Risky use:

- Use in physically hazardous situations (e.g., driving a car under the influence, operating heavy machinery).
- Continued use despite awareness of problems related to or exacerbated by substance use (e.g., continued alcohol use despite having cirrhosis).

Pharmacologic indicators:

- Drug tolerance
- Drug withdrawal

Tobacco-Related Disorders

Substance:

Nicotine from the tobacco plant (consumed in cigarettes, cigars, pipes, e-cigarettes).

Mechanism of Action :

Stimulates nicotinic receptors in autonomic ganglia → Sympathetic and parasympathetic stimulation.

Clinical features :

Tobacco Intoxication	Tobacco Withdrawal
<ul style="list-style-type: none">- Euphoria- Tachycardia, mild HTN, weight loss- Restlessness, anxiety- Increased gastrointestinal motility- Insomnia	<ul style="list-style-type: none">- Dysphoria, depressed mood- Irritability, frustration, anger, restlessness, anxiety- Insomnia- Impaired concentration- Increased appetite, weight gain

Physical Signs

Nicotine Staining :



Complications

- COPD
- Cardiovascular disease
- Cancer(e.g.,lungcancer)

Treatment

Counseling &Support

Varenicline :

- (partialnicotine receptor agonist): Reduces positive symptoms and prevents withdrawal.

Bupropion:

- Reduces craving and withdrawal symptoms.

Nicotine replacement therapy :

- (inhaler, lozenges, transdermal patch, nasal spray, gum).

Alcohol

Alcohol is a central nervous system depressant. It can change your mood, behavior, and self-control. It can cause problems with memory and thinking clearly.

Alcohol can also affect your coordination and physical control.

Alcohol activates **gamma-aminobutyric acid (GABA)**, dopamine, and serotonin receptors in the central nervous system (CNS).

Thus, alcohol abuse can produce serious temporary psychological symptoms including depression, anxiety, and psychoses.

On Long-term, escalating levels of alcohol consumption can produce **tolerance** as well as **adaptation** of the body that cessation of use can precipitate a **withdrawal syndrome***



Signs Of Alcohol Intoxication :

- Slurred speech
 - Dizziness
 - Incoordination
 - Unsteady gait
 - Nystagmus
 - Impairment in attention or memory
 - Stupor or coma
 - Double vision
-

Treatment :

- Perform an ABCDE survey to assess hemodynamic and respiratory stability.
- Check vital signs and glucose; treat **hypoglycemia** if present.
- Administer **naloxone** for opioid overdose if co-ingestion is suspected.

Provide supportive care when appropriate; ex:

- Management of dehydration and hypovolemia.
- Respiratory support.
- Prophylactic dose of **thiamine** supplementation (**for Wernicke's encephalopathy**).
- o Electrolytes repletion.
- o Gastrointestinal evacuation (e.g., gastric lavage, induction of emesis, and charcoal) is not indicated in the treatment of EtOH overdose unless a significant amount o EtOH was ingested within the preceding 30–60 minutes (**rapid absorption of alcohol**)
- (CT) scan of the head may be necessary to rule out subdural hematoma or other brain injury.
- Severely intoxicated patients may require mechanical ventilation with attention to acid–base balance, temperature, and electrolytes while they are recovering.

Complication of chronic alcohol use



(Wernicke's Encephalopathy)

Definition:

An acute, reversible condition caused by **severe thiamine (vitB1) deficiency***, often due to chronic heavy alcohol use.

The classical triad (seen in about a third of patients):

1. Confusion
 2. Oculomotor dysfunction (vertical nystagmus is the most common), diplopia .
 3. Gait ataxia
-



Other Manifestations

- Autonomic dysfunction: hypotension, syncope, hypothermia .
- Peripheral neuropathy: paresthesia, foot drop, decreased DTR.
- Cardiovascular dysfunction: tachycardia, exertional dyspnea.

Management:

- Immediate **IV administration of high-dose Vit B1** upon suspicion of Wernicke's encephalopathy until symptoms recede, followed by a lower dose.
- Thiamine must be administered **before** IV glucose infusions because glucose administration without thiamine can worsen encephalopathy (thiamine is a necessary cofactor for glucose metabolism).
- Long-term oral replacement of **(Vit B complex)**.



Complication of chronic alcohol use



(Korsakoff Syndrome)

Definition:

It is a **late** development in patients with persistent Vit B1 deficiency

Chronic thiamine deficiency, especially in patients with alcohol use disorder, frequently progresses to Korsakoff syndrome

Characterized by :

- **Irreversible** personality changes, apathy, **amnesia***
 - Patients create fabricated memories to fill in the gaps of their memory (**Confabulation**)
 - Disorientation to time, place, and person.
 - Hallucination.
-



Management:

- Oral thiamine supplementation to prevent further progression to irreversible complications.
- Psychiatric and psychological therapy.
- Memory strengthening exercises and aids.

Fetal Alcohol Syndrome (FAS)

Definition: A spectrum of physical and neurodevelopmental abnormalities due to maternal alcohol use during pregnancy.

Key Features:

- Facial abnormalities: Smooth philtrum, thin upper lip, small palpebral fissures
- Growth retardation: Prenatal and/or postnatal
- Neurodevelopmental impairment: Microcephaly, intellectual disability, behavioral issues (e.g., ADHD-like)
- Organ defects: Congenital heart defects (e.g., VSD, ASD)

Pathophysiology:

- Alcohol crosses placenta → impairs cell migration and division → CNS and craniofacial defects.

Mnemonic: FAS = Flat face, Attention deficits, Small size

Alcohol Withdrawal

The **DSM-V criteria** for alcohol withdrawal require the cessation or reduction of alcohol use that was heavy and prolonged as well as the presence of specific physical or neuropsychiatric symptoms.

Clinical Presentation of Alcohol Withdrawal Syndrome :

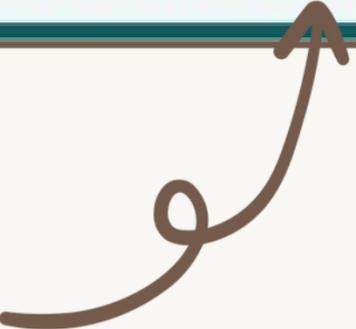
TABLE 7-3. Alcohol Withdrawal Symptoms

EtOH withdrawal symptoms usually begin in 6–24 hours and last 2–7 days.

Mild: Irritability, tremor, insomnia.

Moderate: Diaphoresis, hypertension, tachycardia, fever, disorientation.

Severe: Tonic-clonic seizures, DTs, hallucinations.



Delirium Tremens

It is the **most severe form of ethanol withdrawal**, and it is a medical emergency that can result in significant morbidity and mortality, occurs in **5%** of patients with **20%** risk of mortality

Clinical features:

- Altered mental status (**confusion**).
- Autonomic hyperactivity (such as tachycardia, **fever**, anxiety, insomnia, and hypertension).
- Visual or tactile **hallucinations**.

Onset: Usually **72–96 hours** after cessation of or reduction in alcohol consumption.

Peak: 2-5 days

- Patients with delirium are a danger to themselves and to others, **Because of the unpredictability of their behavior**, patients may be assaultive or suicidal or may have hallucinations or delusional thoughts.

Treatment Of Alcohol Withdrawal

Minor alcohol withdrawal syndrome may not need pharmacotherapy in all cases. The patient needs supportive care in a **calm and quiet environment and low lighting**, and observation for a period of up to **36 h**, after which he is unlikely to develop withdrawal symptoms.

Benzodiazepines are the mainstay of management of alcohol withdrawal states, followed by **anticonvulsants**, which may be considered in mild withdrawal states due to their advantages of lower sedation and lower chances of dependence.

Moderate to severe alcohol withdrawal syndrome without seizures or DT, patients should be started immediately pharmacological therapy, while monitoring the clinical signs of tachycardia and hypertension.

Severe alcohol withdrawal **with seizures**, the occurrence of seizures during the alcohol withdrawal period is indicative of severe alcohol withdrawal. Seizure prophylaxis with **lorazepam intravenously** must be given to all patients with seizures in the current withdrawal period at presentation.

Treatment Of Alcohol Withdrawal

Severe alcohol withdrawal with DT, the treatment is by achieving a calm, but awake state or defined as a sleep from which the patient is easily aroused, done by using **intravenous diazepam** while closely monitoring the patient during the procedure.

Refractory DT can be managed with **phenobarbital or adjuvant antipsychotics**.

Detoxification is the process of weaning a person from a psychoactive substance by gradually tapering the substance or by **substituting it with a cross-tolerant pharmacological agent and tapering it**.

First Line Treatments

- **Naltrexone:** Opioid receptor antagonist, reduces desire and the “high” associated with alcohol. Will precipitate withdrawal in patients with physical opioid dependence.
- **Acamprosate:** Thought to modulate glutamate transmission. Use for relapse prevention in patients who have stopped drinking (post-detoxification). Major advantage is that it can be used in patients with liver disease. Contraindicated in severe renal disease.
- Side effect as diarrhea

Second Line Treatments

- **Disulfiram:** Blocks the enzyme **aldehyde dehydrogenase** in the liver, causing aversive reactions to alcohol (**flushing, headache, nausea/vomiting, palpitations, shortness of breath**) due to catecholamine release. Absolute contraindication with severe cardiac disease, pregnancy, and psychosis. Liver function should be monitored. Best used in highly motivated patients, as medication adherence is an issue.
- **Topiramate:** Anticonvulsant that potentiates GABA and inhibits glutamate receptors, reduces desire for alcohol and decreases alcohol use.

Sedatives

1- Benzodiazepines

Examples

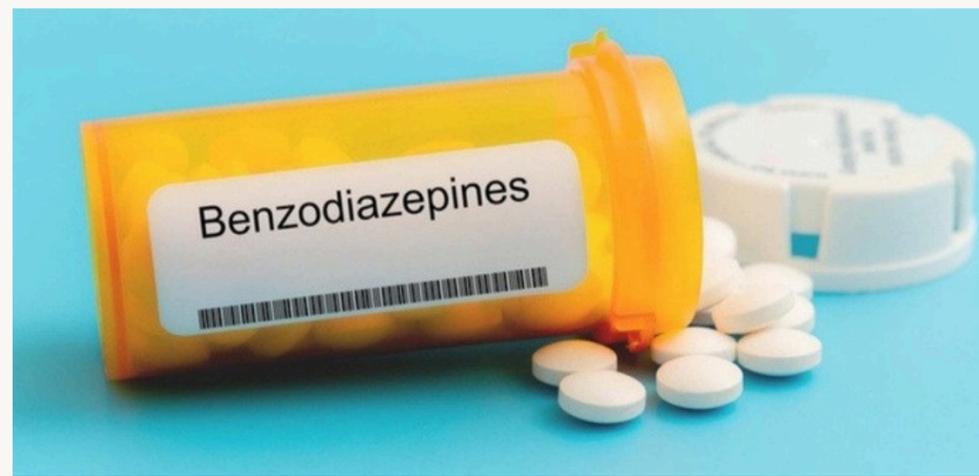
Diazepam, Oxazepam, Lorazepam.

Medical uses

anxiety, alcohol and barbiturates withdrawal

Classic overdose presentation:

- o CNS depression with normal vitals
- o Altered mental status
- o Slurred speech
- o Ataxia
- o Rarely cause respiratory depression (safer drugs)



withdrawal:

- Occurs with abrupt cessation in chronic user.
- Timing depends on drug; Long-acting BZD → Longer washout
- Presentation: Tremors / Anxiety / Depressed mood (“dysphoria”) / Hypersensitivity to sensations (noise, touch) / Psychosis / Seizures

Management (Flumazenil):

- Antagonist of benzodiazepine receptor.
- FDA-approved clinical uses for flumazenil include reversal agents for benzodiazepine overdose.
- Overdose has low mortality rate.
- Flumazenil may cause withdrawal seizures in patients with a history of seizures.



2- *Barbiturates*

Examples : Phenobarbital, pentobarbital.

- o Potentiate the effects of GABA by binding to the receptor and increasing duration of chloride channel opening.
- o Used in the treatment of epilepsy and as anesthetics.
- o Have a lower margin of safety relative to BZDs.
- o They are synergistic in combination with BZDs, respiratory depression can occur.
- o They are physiologically addicting if taken in high doses over 1 month.
- o Overdose: Respiratory depression.
- o Abrupt abstinence after chronic use can be life threatening.

Clinical Presentation :

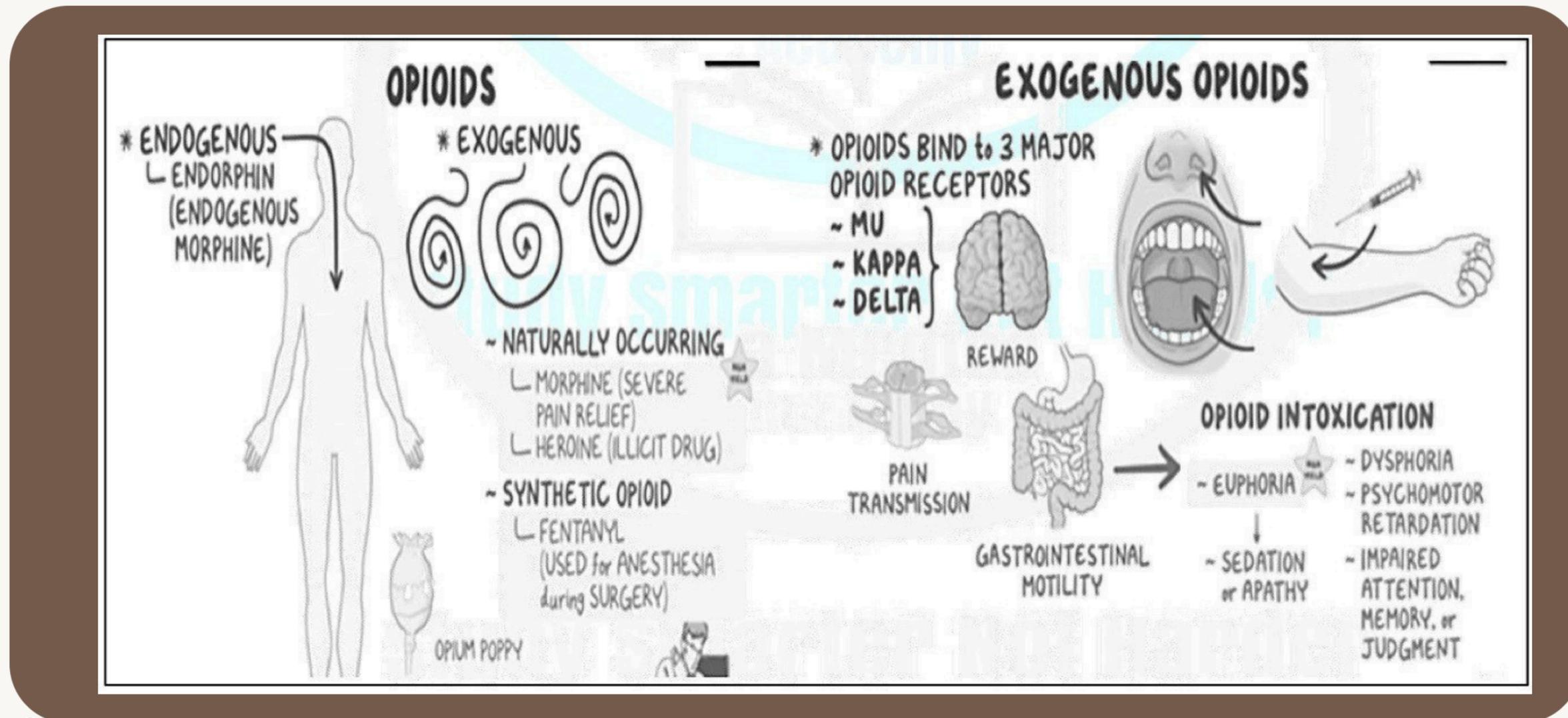
- o Signs and symptoms of withdrawal are the same as these of alcohol withdrawal.
- o Tonic-clonic seizures may occur and can be life threatening.

Treatment :

Benzodiazepines (stabilize patient, then taper gradually).



3- Opioids



- Opioid overdose results from the toxic effects of exogenous opioid
- Deaths related to opioid overdose have been steadily increasing in the United States over the past two decades because of a sharp increase in the prescription of opioid for chronic pain and increasing amounts of illegally manufactured fentanyl.

Sedatives:Opioids

Common clinical features of opioid overdose include :

- Respiratory depression
- CNS depression
- miosis .

Tx of suspected opioid overdose:

● Airway management and prompt assessment of the need for naloxone to counter opioid induced respiratory depression, which can be fatal. Inpatient admission is indicated for patients

with ongoing respiratory depression , overdose from long-acting opioid , or medical complications from an opioid overdose.

● All patients with a non iatrogenic opioid overdose should undergo an assessment for

- substance use disorder and be discharged with take-home intranasal naloxone .

Neonatal Abstinence Syndrome (NAS)

Definition:

~~Withdrawal~~ symptoms in newborns exposed to opioids (e.g., heroin, methadone) in utero.

Symptoms (start 24-72 hrs after birth):

- Neurologic: Irritability, high-pitched cry, tremors, seizures
- GI: Diarrhea, vomiting, poor feeding
- Autonomic: Sweating, fever, yawning
- Other: Sneezing, nasal congestion

Management:

- Supportive care: swaddling, low-stimulation environment
- Pharmacologic: Morphine or methadone (tapered), sometimes clonidine

Stimulants: 1- Amphetamine

- Potent stimulant by increasing synaptic levels of the biogenic amines, dopamine, norepinephrine and serotonin.
 - Amphetamine are FDA-approved for treatment of attention deficit-hyperactivity disorder (ADHD) and narcolepsy .



Symptoms of amphetamine intoxication include

- Euphoria
- Dilated pupils
- Tachycardia
- Chest Pain



- Amphetamine withdrawal can cause prolonged depression.
- Complications of their long half-life can cause: ongoing psychosis, even during abstinence ,
- so treatment is: sedation and observation with antipsychotics .

Stimulants: 2- Cocaine

Uncontrolled pattern of substance use leads to significant physical, psychological, and social impairment or distress, with continued use despite substance-related problems.

Overdose can cause :

- Death secondary to cardiac arrhythmia
- MI
- Seizure
- Respiratory depression.



Treatment of cocaine use disorder :

- There is no (FDA)-approved pharmacotherapy for cocaine use disorder.
- Off-label medications are sometimes used as naltrexone
- Psychological interventions are the mainstay of treatment

Cocaine Withdrawal :

- Abrupt abstinence is not life threatening.
- Causes post-intoxication depression .
- Occasionally, these patients can become suicidal.
- With mild-to-moderate cocaine use, withdrawal symptoms resolve within 72 hours with heavy, chronic use, they may last for 1-2 weeks.
- Treatment is supportive, but severe psychiatric symptoms may warrant hospitalization.

Marijuana

Cannabis ("marijuana," "pot," "weed," "grass") is the most commonly used illicit substance in the world.

The main psychoactive component which produces the "high" in cannabis is THC (tetrahydrocannabinol).

Cannabinoid receptors in the brain inhibit adenylate cyclase.

- Marijuana has shown some efficacy in treating nausea and vomiting in chemotherapy patients, increasing appetite in AIDS patients, in chronic pain (from cancer), and lowering intraocular pressure in glaucoma. A specific class of compounds found in marijuana, cannabidiols (CBDs), is currently being studied for management of pain, seizures, and anxiety/depression.

Intoxication

- Marijuana causes euphoria, anxiety, impaired motor coordination, perceptual disturbances (sensation of slowed time), mild tachycardia, anxiety, conjunctival injection (red eyes), dry mouth, and increased appetite ("the munchies").
- Cannabis-induced psychotic disorders with paranoia, hallucinations, and/or delusions may occur. There is no overdose syndrome for marijuana use.
- Cannabis use disorder occurs in approximately 10% of those who use (up to 50% of daily users).
- Chronic use may cause respiratory problems such as asthma and chronic bronchitis, immunosuppression, cancer, and possible effects on reproductive hormones.
- **Treatment:** Supportive, psychosocial interventions (e.g., contingency management, groups).

Withdrawal

- Withdrawal symptoms may include irritability, anxiety, restlessness, aggression, strange dreams, depression, headaches, sweating, chills, insomnia, and low appetite.
- **Treatment:** Supportive and symptomatic.



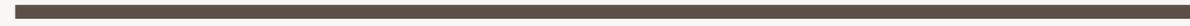
KEY FACT

An LSD flashback is a spontaneous recurrence of symptoms mimicking a prior LSD "trip" that may last for minutes to hours.



KEY FACT

Dronabinol is a pill form of THC that is FDA-approved for certain indications.



Thank you

