

# Substance use and related psychiatric disorder

Małgorzata Urban –Kowalczyk PhD



your name

# Epidemiology

- Drug-related problems cut across all social and economic boundaries.
- All age groups, but particularly adolescents and young adults, are affected.
- Lifetime prevalence for drug abuse and dependence is 14,6% in men, 9,5% in women.

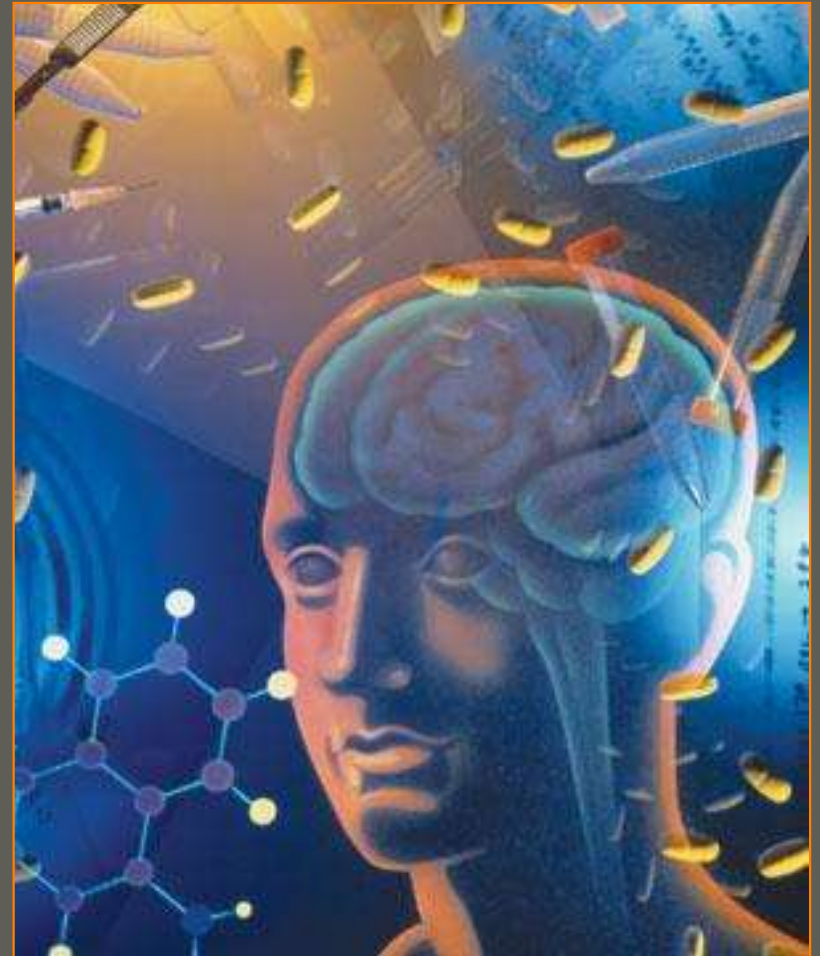
*(National Comorbidity Survey)*

# Why drugs are used ?

- Rapid relief of anxiety (e.g. opiates, sedatives, hypnotic, anxiolytics)
- Relieve boredom and fatigue, provide a sensation of energy and increase mental alertness (stimulants)
- Temporary escape from reality (hallucinogens)

# Categories of drugs

- Opiates
- Cannabis
- CNS stimulants
- Hallucinogens
- Inhalants
- Sedatives and hypnotics
- Nicotine /Tobacco
- Anabolic-Androgenic steroids
- Legal highs



your name

# Opiates - *Opium*



your name



# Opiates

- Morphine
- Heroin
- Methadone
- Codeine
- Meperidine



your name

# Opioids receptors

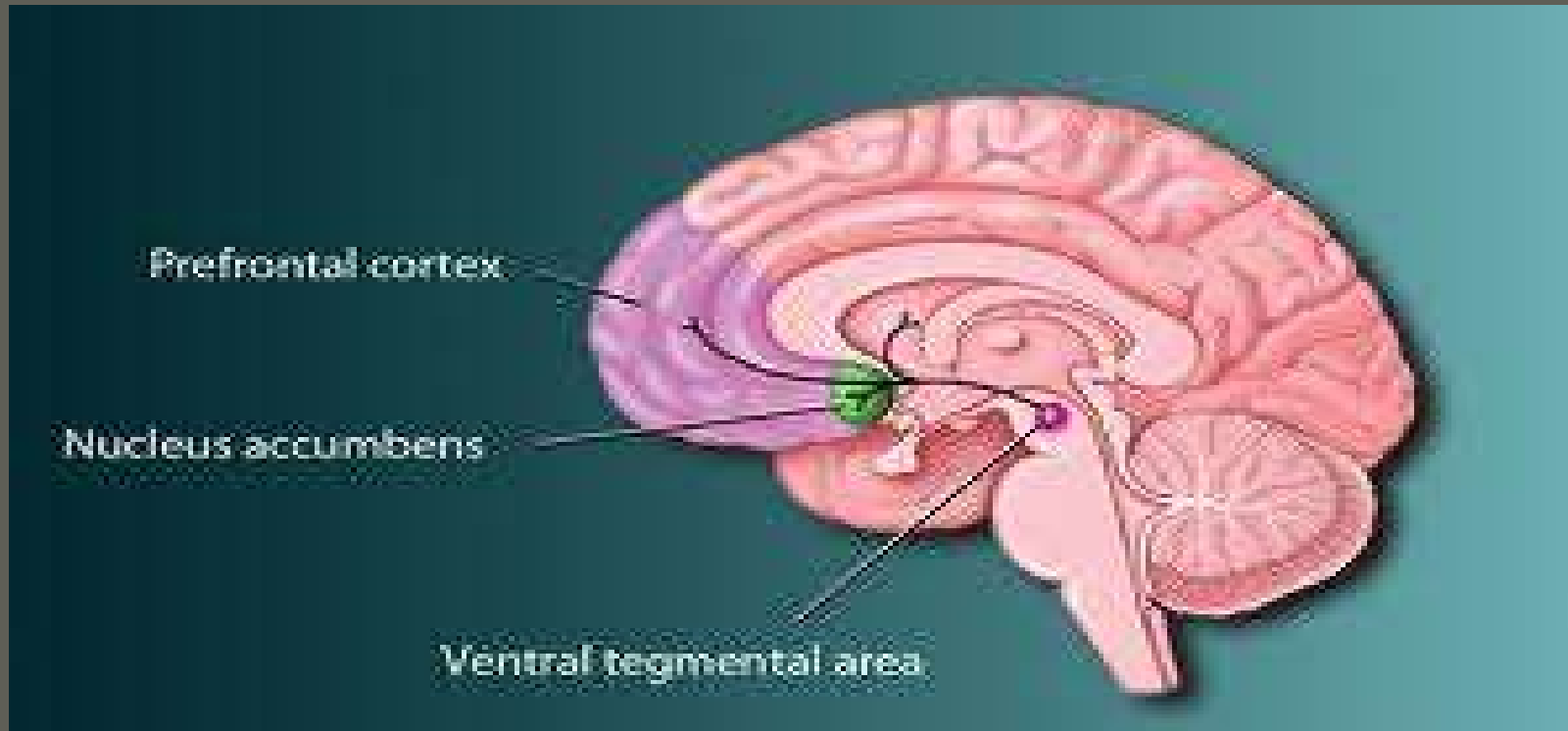
- Analgesia
- Respiratory depression
- Constipation
- Dependence
- Diuresis
- Sedation

## Additionally:

- Significant effects on dopaminergic and noradrenergic systems



# Opioids – addictive properties



Activation of the ventral tegmental area (VTA), dopaminergic neurons that project to the limbic system.

**BRAIN REWARD SYSTEM**

**your name**



# Opiates use consequences

- High mortality rates (inadvertent fatal overdoses, accidental deaths, and suicide).
- Often comorbid medical illness: serum hepatitis, HIV, pneumonia, skin ulcers.
- Sexual interest diminishes
- In women menstruation may cease.
- Many users turn to crime.



your name

# Opioids

## • INTOXICATION

- Psychomotor retardation
- Drowsiness
- Slurred speech
- Impaired memory and attention

## • OVERDOSE

- Unresponsiveness  
coma
- Slow respiration
- Hypothermia
- Hypotension
- Bradycardia
- Pinpoint pupils
- Respiratory depression

# Physical signs indicating opioids use

- That occur after a heroin-addicted person “shoots up” (which may occur 3 or more times a day) include:
  - Flushing
  - Pupillary constriction
  - Slurred speech
  - Respiratory depression
  - Hypotension
  - Bradycardia
  - Constipation
  - Nausea
  - Vomiting

# Opioid withdrawal syndrome

- Resembles a severe case of influenza.
- The symptoms include craving of the drug and:
  - pupillary dilatation
  - hot and cold flashes
  - lacrimation
  - muscle and joint pain
  - rhinorrhea
  - abdominal cramps
  - piloerection ("gooseflesh")
  - seizures
  - sneezing
  - severe anxiety
  - yawning
  - restlessness
  - nausea and vomiting
  - irritability
  - diarrhea
  - insomnia
  - hypertension
  - anorexia
  - tachycardia

**your name**

# Opioid withdrawal syndrome

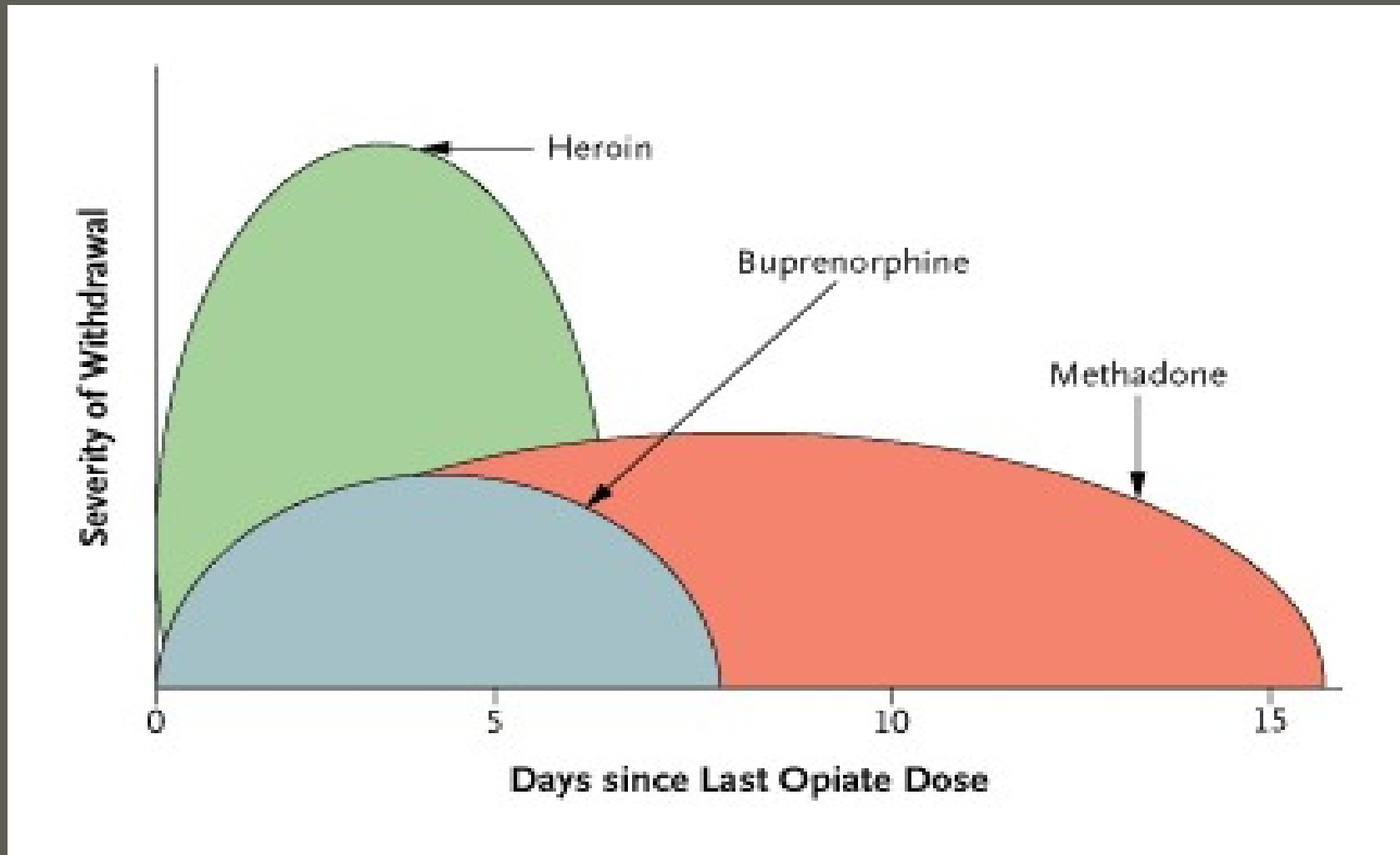
- Onset of peak opioid-withdrawal symptoms and their duration after abrupt discontinuation depend on the half-life of the drug involved:

*heroin and morphine* - symptoms peak within 36 to 72 hours and last for 7 to 10 days

*methadone* - symptoms peak at 72 to 96 hours but last for 14 days or more



# Opioid withdrawal syndrome



# Opioid withdrawal treatment

*Methadone* – a long-acting opioid

- The initial dose is determined by the presenting signs and symptoms of withdrawal
- Daily dose 20 – 80 mg
- Withdrawal from short-acting substances typically takes 7-10 days
- From longer-acting opioids proceeds more slowly (e.g., 2-3 weeks).

# Methadone

<u>Signs &amp; symptoms</u>	<u>Initial dose</u>
Lacrimation, rhinorrhea, diaphoresis, restlessness, insomnia	5 mg
Dilated pupils, piloerection, muscle twitching, myalgias, arthralgias, abdominal pain	10 mg
Tachycardia, hypertension, tachypnea, fever, anorexia, extreme restlessness, nausea	15 mg
Diarrhea, vomiting, dehydration, hyperglycemia, hypotension	20 mg

your name

# Opioid withdrawal treatment

*Clonidine* – provides good suppression of the autonomic signs of withdrawal

- At first sign of withdrawal, the patient is given 0,1-0,3mg (three to four times a day ) of clonidine, which is repeated at bedtime.
- The dose should be withheld if the diastolic blood pressure falls below 60 mmHg or marked sedation occurs.
- On days 6-8, the dose can be decreased by 50%, and on day 9, clonidine can be discontinued altogether.

# Opioid withdrawal treatment

*Naltrexon* – a long-acting opioid antagonist = it blocks opioid receptors – preventing the behaviorally reinforcing euphoric effects of opiates

- Usually is given over 5-10 days after the last opiate use at doses of 25-50mg/day

*Buprenorphine* - the combination of clonidine and naltrexone

- a mixed opiate agonist-antagonist

- Benzodiazepines
- Psychotherapy



# Other useful medications

- Arthralgia, fever, myalgia – Ibuprofen 600-800mg every 6 h
- Diarrhea – Imodium 2mg/die
- Nausea – Metoclopramide 20mg every 6 h
- Anxiety, restlessness – Hydroxyzine 25-50mg every 6h or Lorazepam 1-2mg every 6-8 h
- Insomnia – Lorazepam 2mg/night  
Trazodone 50 –100 mg/night

# Cannabis

- The active ingredient in marijuana is delta-9-tetrahydrocannabinol (THC)
- Marijuana is a hemp plant (*Cannabis sativa*) – has been used for centuries for medical and recreational purposes
- The plant contains varying amounts of THC



# Cannabis

- Is generally smoked as a cigarette, causing intoxication within 10-30 minutes
- THC and its metabolites are highly lipid soluble and accumulate in fat cells
- The half-life is approximately 50 hours
- Intoxication can last 2-4 hours depending on the dose, although behavioral changes may continue for many hours
- Oral ingestion (e.g., from adding marijuana to baked goods) produces a slower onset of action but leads to more powerful intoxication effects.
- No characteristic withdrawal syndrome occurs, detoxification is unnecessary.

# Cannabis



your name

# Cannabis

- Unwanted effects reported by marijuana users include:
  - feelings of anxiety
  - paranoia
  - impaired attention
  - decreased motor coordination
- It rarely causes severe psychological or physical reactions
- EEG studies show a suppression of rapid eye movement (REM) sleep and diffuse slowing of background activity



# Long – term cannabis use

- Cerebral atrophy
- Seizure susceptibility
- Chromosomal damage
- Birth defects
- Impaired immune reactivity
- Alteration in testosterone concentration
- Dysregulation of menstrual cycles

# Cannabis Amotivational Syndrome

- Result of heavy marijuana use.
- Symptoms:
  - apathy, anergy
  - lethargy
  - reduced concentration
  - gaining weight
  - unwillingness to persist in a task required prolonged attention or tenacity

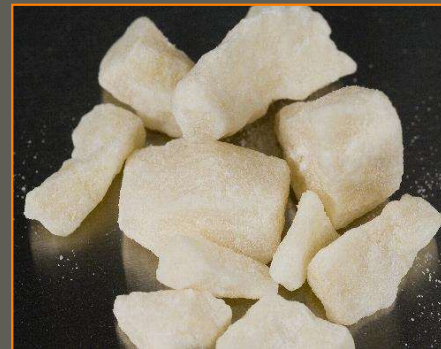
# Cocaine



your name

# CNS stimulants - Cocaine

- Second most commonly used illicit drug in the U.S.
- Can be injected, smoked, sniffed, or snorted.
- Crack cocaine looks like a small rock, chunk or chip and it is sometimes off-white or pink in color.



# CNS stimulants - Cocaine

- Powerfully addictive drug, strong stimulating CNS.
- Extracted from the leaves of the South American coca plant.
- Modifies the action of dopamine in the brain.
- increased activation of the dopaminergic reward pathway leads to the feelings of euphoria and the 'high' associated with cocaine use.
- Effects appear almost immediately after a single dose, and disappear within a few minutes or hours.
- Makes the user feel euphoric, energetic, talkative, and mentally alert, especially to the sensations of sight, sound, and touch.
- Temporarily decrease the need for food and sleep.



# Cocaine side effects

## Short – term effects

- Increased energy
- Decreased appetite
- Mental alertness
- Increased heart rate and blood pressure
- Constricted blood vessels
- Increased temperature
- Dilated pupils

your name

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# What are the hazards of cocaine?

- The short-term and long-term effects of cocaine are equally dangerous.
- The dangers of experiencing cardiac arrest or seizures followed by respiratory failure is equal in both short and long term abuse.
- Heart disease, heart attacks, respiratory failure, strokes, seizures, and gastrointestinal problems are not uncommon among long-term users of cocaine and crack.
- The long-term effects of using cocaine can include extreme agitation, violent mood swings and depression.
- Prolonged use of snorting cocaine cause ulcerations in the mucous membrane of the nose and holes in the barrier separating the nostrils.
- Using can results extreme insomnia and sexual problems

your name

# CNS stimulants - *Amphetamine*

- Potent psychomotor stimulant.
- Can modify the action of dopamine and noradrenaline in the brain.
- Can increase the concentration of dopamine in the synaptic cleft.
- Can cause an increased release of noradrenaline into the synaptic cleft.
- May be sniffed, swallowed, snorted or injected.
- Street names: speed, up, fast, louee, goey, whiz, pep pills, uppers.
- Normally detectable in urine for 24-72 hours after use.

# CNS stimulants - *Amphetamine*

- Amphetamines are used to increase performance and to induce a euphoric feeling.
- Typical users: students, longdistance truck drivers, business people, athletes in competition, soldiers during wartime.
- Amphetamine is less addictive than cocaine.
- Amphetamine-like substance: ephedrine, pseudoephedrine, phenylpropranolamine (PPA).
- Pregnant woman using amphetamines often have babies with low birthweight, small head circumference, early gestational age and growth retardation.

# Amphetamine effects

## Physical symptoms

- heart rate, breathing and blood pressure increase
- dry mouth, increased sweating
- enlargement of the eye's pupils
- headaches
- insomnia

# Amphetamine adverse effects

## Life – threatening:

- Myocardial infraction
- Severe hypertension
- Cerebrovascular disease
- Ischemic colitis
- Continuum of neurological symptoms from twitching to tetany, to seizures, to coma and death

## Non - life – threatening:

Flushing

Pallor

Cyanosis

Fever

Headache

Tachycardia, palpitations

Nausea, vomiting

your name

# Amphetamine withdrawal

- Symptoms may include:
  - hunger
  - headache, muscle and stomach cramps
  - extreme fatigue
  - anxiety, irritability
  - depression, dysphoric mood
  - long but restless sleep, often interrupted by nightmares
- Some experience severe distress or feelings of panic.
- Withdrawal symptoms peak in 2 to 4 days; resolves in 1 week.

# Amphetamine induced psychosis

- Amphetamine psychosis is similar, but not identical to, paranoid schizophrenia.
- Can be differentiated from psychotic disorders when symptoms resolve after amphetamines discontinuation.
- Clinical picture: predominance in visual hallucinations, generally appropriate affects, hyperactivity, hypersexuality, confusion and incoherence, and little evidence of disordered thinking. Usually lacks the affective flattening and alogia of schizophrenia.



# Amphetamine induced psychosis

- The first step in treatment is to wait – symptoms can resolve without pharmacotherapy.
- Neuroleptics are used in treatment, because they block DA's access to postsynaptic receptor sites (e.g. haloperidol).
- Benzodiazepines are useful to treat agitation and hyperactivity (e.g. diazepam).
- Amphetamine can trigger the development of true paranoid schizophrenia !

# Amphetamine



your name

# CNS stimulants - *Methamphetamine*

- Powerfully addictive stimulant that dramatically affects the central nervous system.
- Commonly known as "speed," "meth," and "chalk." In its smoked form it is often referred to as "ice," "crystal," "crank," and "glass."
- Chemical structure is similar to that of amphetamine.
- Causes increased activity, decreased appetite, and a general sense of well-being. The effects of methamphetamine can last 6 to 8 hours.
- Typically is a state of high agitation that in some individuals can lead to violent behavior.

# Methamphetamine



your name

# Hallucinogens

- Are a diverse group of compounds.
- Most are synthetic (LSD, Ecstasy).
- Some are of botanical origin (e.g., peyote, mescaline).
- They can induce psychotic-like experiences (hallucinations perceptual disturbances, feelings of unreality).
- Some believe that hallucinogens bring them closer to God or can expand their minds.



# Hallucinogens

- They affect the neurotransmitters
  - Dopamine
  - Serotonin
  - Acetylcholine
  - $\gamma$ -aminobutyric acid (GABA)
- Tolerance can develop to some (e.g., LSD) but not to others (e.g., PCP).
- They are probably not physically addicting, but many persons have become psychologically dependent on them.

# Hallucinogens

- “Bad Trips” occasionally occur, in which patients become markedly anxious or paranoid
- Flashback – a brief reexperiencing of the drug’s effects that occurs in situations unrelated to taking the drug
  - they consist of visual distortions
  - geometric hallucinations
  - misperceptions

# Hallucinogens – Ecstasy (MDMA)

- Synthetic, psychoactive drug with both stimulant (amphetamine-like) and hallucinogenic (LSD-like) properties.
- Neurotoxic, in high doses it can cause a sharp increase in body temperature (malignant hyperthermia) leading to muscle breakdown and kidney and cardiovascular system failure.



your name



# Hallucinogens – *Ecstasy (MDMA)*

## Reported Undesirable Effects (up to 1 week post-MDMA, or longer):

- Anxiety
- Restlessness
- Irritability
- Sadness
- Impulsiveness
- Aggression
- Sleep disturbances
- Lack of appetite
- Thirst
- Reduced interest in and pleasure from sex
- Significant reductions in mental abilities

## Potential Adverse Health Effects:

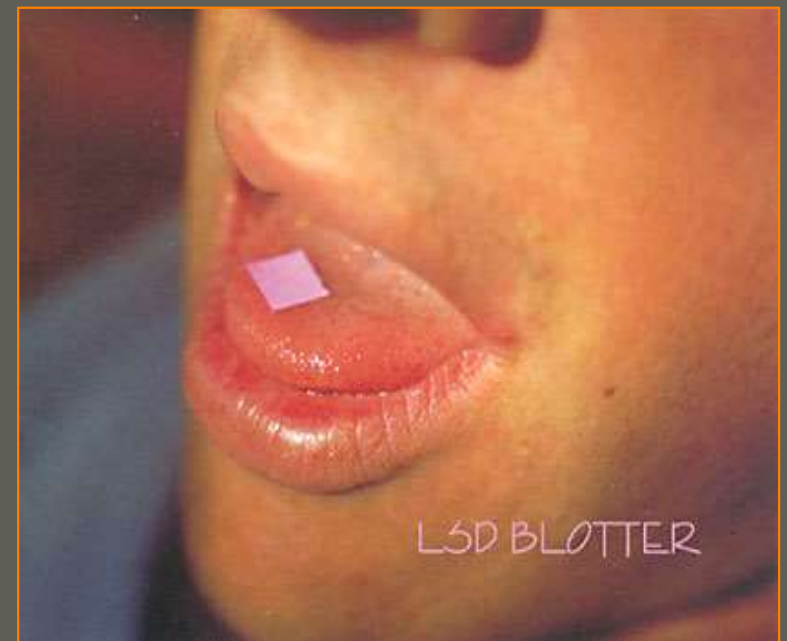
- Nausea
- Chills
- Sweating
- Involuntary jaw clenching and teeth grinding
- Muscle cramping
- Blurred vision
- Marked rise in body temperature (hyperthermia)
- Dehydration
- High blood pressure
- Heart failure
- Kidney failure
- Arrhythmia

## Symptoms of MDMA Overdose:

- High blood pressure
- Faintness
- Panic attacks
- Loss of consciousness
- Seizures

# Hallucinogens - LSD

- LSD = lysergic acid diethylamide
- Sold as tablets, capsules, liquid, or on absorbent paper.
- Many users experience flashbacks.



# Hallucinogens of botanical origin

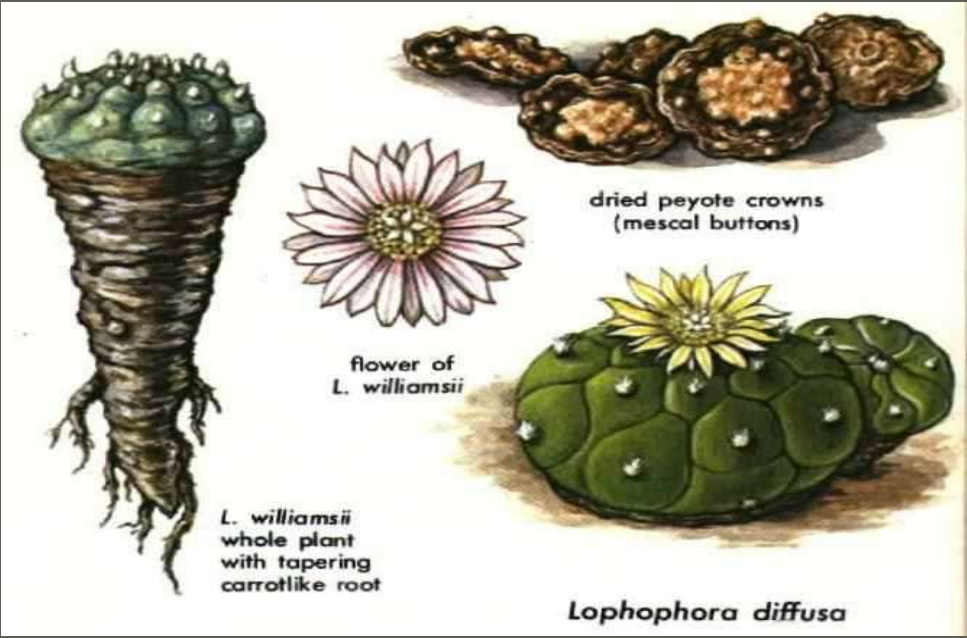


Psilocybin Mushrooms - Schedule I

*Psilocybe mexicana*



Flowering peyote button at The Peyote Foundation



*L. williamsii* whole plant with tapering carrotlike root

dried peyote crowns (mescal buttons)

flower of *L. williamsii*

*Lophophora diffusa*

# Inhalants

- Breathable chemical vapors that produce psychoactive (mind-altering) effects.
- They are often among the first drugs that young children use (3% of U.S. children have tried inhalants by the time they reach fourth grade).
- Categories of inhalants: airplane glue, paint thinner, nail polish remover, gasoline.
- The active substances in the inhalants: toluene, acetone, benzene, other organic hydrocarbons.
- Many other substances found in aerosol cans (e.g., hair spray, room deodorizers).

# Inhalants effects

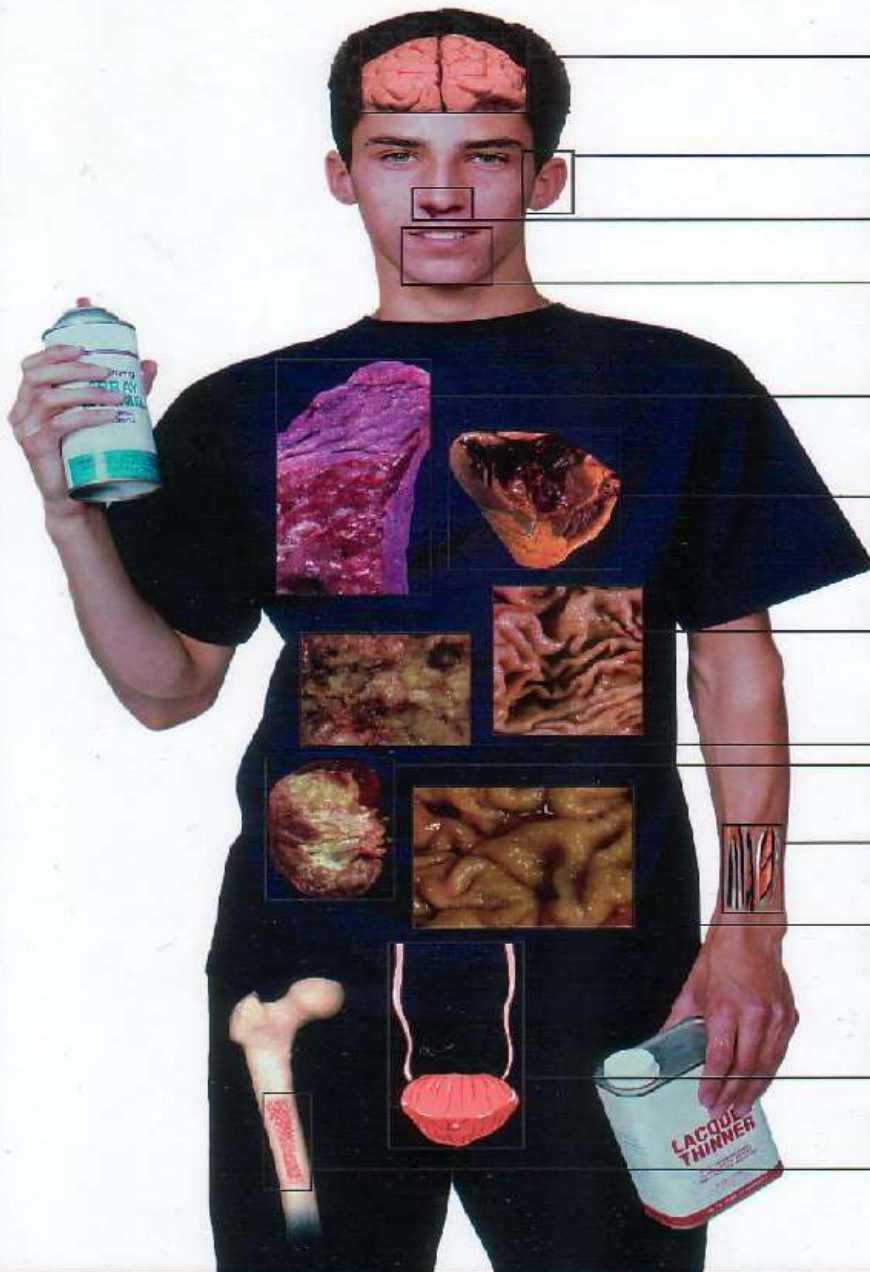
- Dizziness
- Impaired coordination
- Headache
- Distorts senses
- Slurred speech
- Nausea
- Rapid pulse



your name



# INHALANTS



## HARMFUL EFFECTS

**PERMANENT  
BRAIN DAMAGE  
MEMORY LOSS**

**HEARING  
LOSS**

**NOSE BLEEDS  
LOSS OF SMELL**

**SLURRED  
SPEECH**

**SUFFOCATION  
SUDDEN DEATH**

**IRREGULAR  
HEART BEAT  
HEART ATTACK  
AND DEATH**

**NAUSEA AND  
VOMITING**

**LIVER  
DAMAGE**

**KIDNEY  
DAMAGE**

**MUSCLE WEAKNESS  
AND CRAMPING**

**ABDOMINAL  
PAIN**

**INVOLUNTARY  
PASSING OF  
URINE & FECES**

**BONE MARROW  
DEPRESSION**

# Sedatives and hypnotics

- Mainly barbiturates and benzodiazepines.
- Barbiturates are very rarely used (high risk of intoxication) e.g. phenobarbital (Luminal)
- Benzodiazepines are very often prescribed in general medical practice (the most widely prescribed medications in the US – 15% of general population).
- Short-acting benzodiazepines (e.g. alprazolam, lorazepam) are more likely to develop dependence.

# Benzodiazepines

## Short-acting:

- Alprazolam
- Estazolam
- Lorazepam
- Oxazepam
- Triazolam

## Long-acting:

Clorazepate

Diazepam

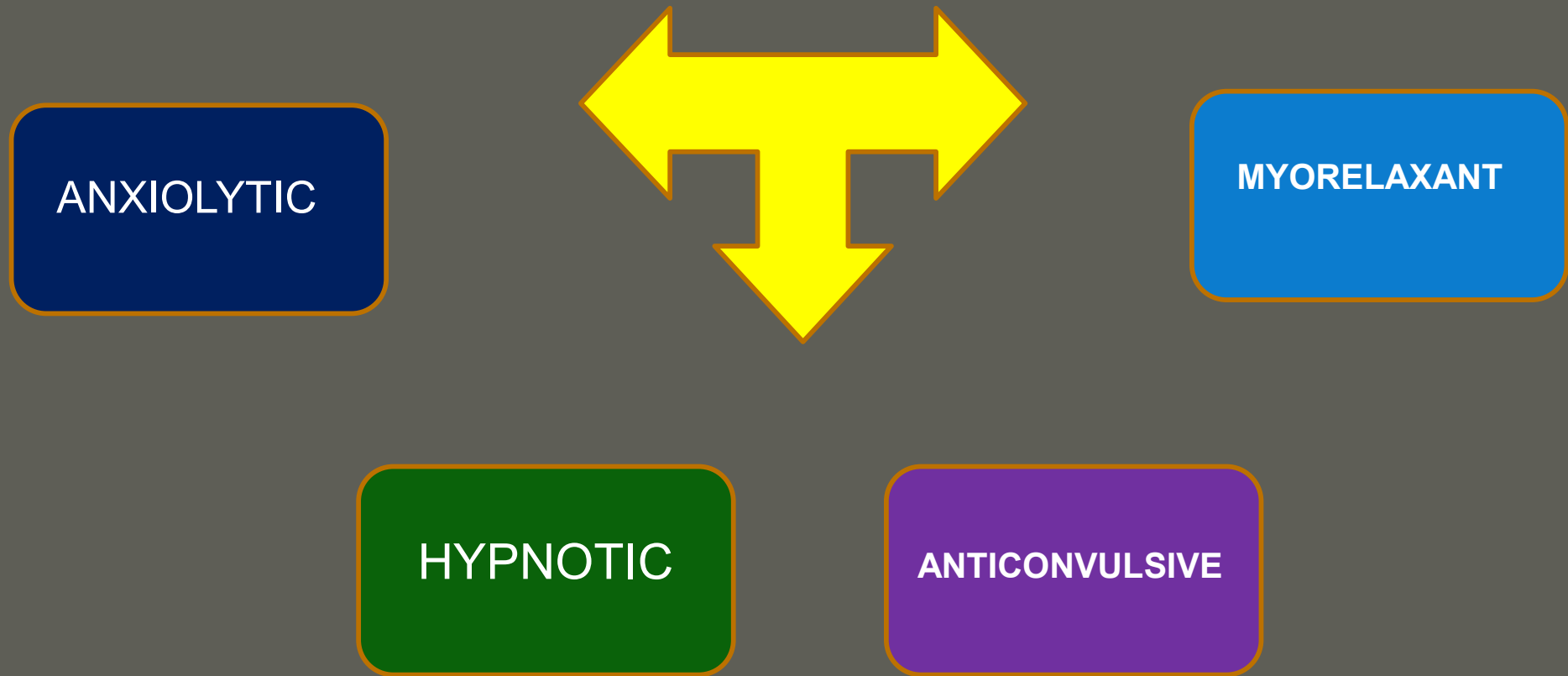
Flunitrazepam  
(Rohypnol)

Clonazepam  
(Klonopin, Rivotril)

Medazepam



# Benzodiazepines properties



# Benzodiazepines overdose



Symptoms include:

- Drowsiness, lethargy
- Ataxia
- Confusion
- Depression of user's vital signs

Often taken in suicidal Attempts.

Antidotum - flumazenil

# Withdrawal

- Should be carefully monitored
- During the first 24 hours of withdrawal, the patient is typically anxious, restless, and apprehensive
- Tremors develop, and deep tendon reflexes become hyperactive
- Signs of autonomic hyperarousal: weakness, nausea and vomiting, orthostatic hypotension, sweating.
- On the second or third day of withdrawal, grand mal seizures can occur
- A withdrawal delirium is associated with confusion, disorientation and visual and somatic hallucinations

# Benzodiazepine Withdrawal

- Increased anxiety
- Panic attacks
- Insomnia, nightmares
- Fears of going mad
- Increased depression
- Breathless feeling
- Suicidal feelings
- Aggression
- Symptoms like "flu"
- Nausea
- Constipation, diarrhea

# Benzodiazepine Withdrawal

- Distorted vision
- Dizziness
- Shaking
- Tight chest
- Ringing in the ears
- Hormone problems
- Headaches
- Rubbery legs
- Sore eyes
- Feelings of tight band around head
- Pain in the neck and shoulders
- Loss of interest in sex, impotence

your name

# Benzodiazepine Withdrawal

- Agoraphobia
- Hallucinations
- Creeping sensation in the skin
- Increased sensitivity to light, sound, touch, and smell
- Outbursts of rage
- Tight throat
- Skin rashes
- Abdominal pain
- Hyperactivity
- Confusion

# Benzodiazepine Withdrawal

- Sweating
- Palpitations, slow pulse
- Chest pain
- Loss of taste, metallic taste
- Thyroid problems
- Sinus problems
- Heavy, aching limbs
- Blurred vision
- Feelings of being pricked with tiny needles



# Benzodiazepine Withdrawal

- Craving for your sleeping pills or tranquilizers
- Pain in the face or jaw that resembles a toothache
- Tingling around mouth, hands, and feet
- Seizures may occur when drugs have been stopped abruptly

# Adjuvant drugs in benzodiazepine withdrawal

## Sometimes indicated:

- Antidepressants – depression, agoraphobia, sedation
- B – blockers – tremor, palpitations
- Carbamazepine (high dose BZD)
- Sedative antihistamines

## No help:

- Buspirone
- Clonidine

# Rational prescribing of sedative and hypnotic agents

- Avoid or limit prescribing to patients if risk for substance abuse is suggested by:
  - A history of alcohol abuse or dependence
  - A history of drug abuse or dependence
  - A presence of borderline or antisocial personality disorder
  - A strong family history of substance abuse or dependence.

# Rational prescribing of sedative and hypnotic agents

- Learn to recognize “red flag” presentations by patients seeking prescription drugs, as suggested by:
  - Dramatic claims of need for a scheduled drug
  - Reports of lost prescriptions
  - Frequent request for early refills
  - Requests for a specific scheduled drug, reports of allergies to other drugs, or use of nonscheduled drugs for pain relief or anxiety
  - Obtaining prescriptions from many physicians

# GHB (gamma- hydroxybutyrate) „date rape”

- GHB has euphoric and sedative qualities, that is most commonly used in nightclub.
- Side effects include loss of conscience, coma, and seizures.
- Often used in combination with other drugs, such as ecstasy and alcohol.
- Also called "liquid ecstasy," "somatomax," "scoop," or "grievous bodily harm."

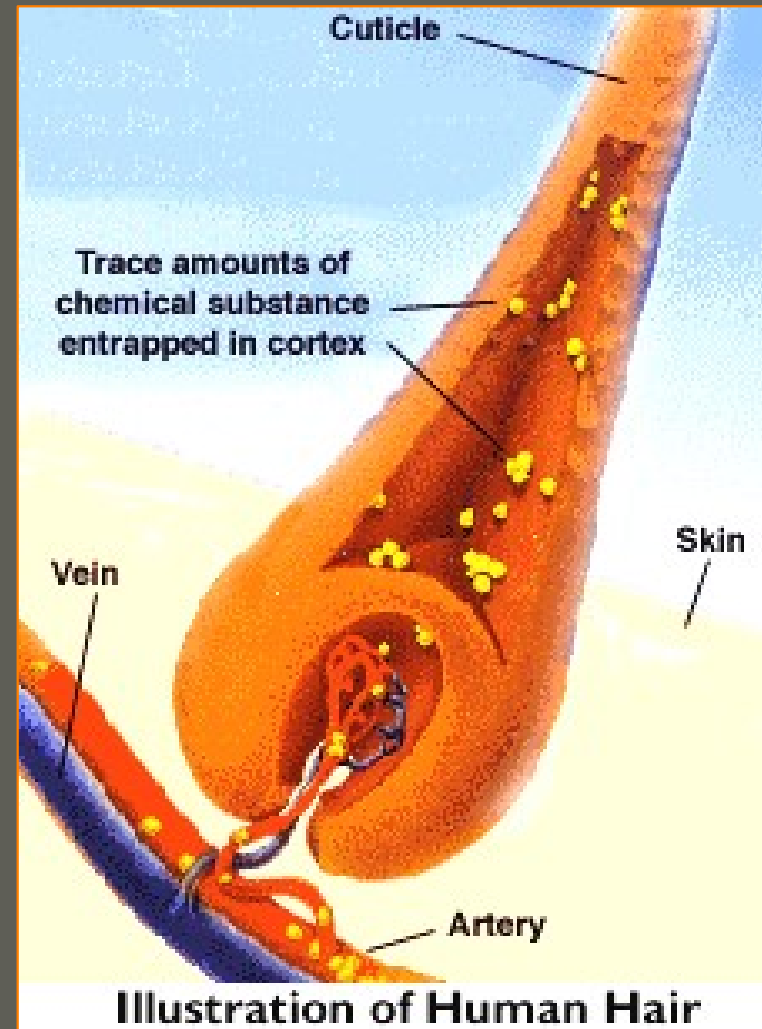


# GHB (gamma- hydroxybutyrate) „date rape“

- Used as a general anesthetic and in treatment of anxiety, stress, insomnia, narcolepsy, alcoholism, and alcohol withdrawal.
- Acts as CNS depressant.
- When used without the person's knowledge, in higher doses than appropriate for their body, and/or mixed with alcohol, it creates memory loss, respiratory depression, muscular fatigue, passing out, coma, and can even cause death.
- In the case of overdose, there is no known antidote.

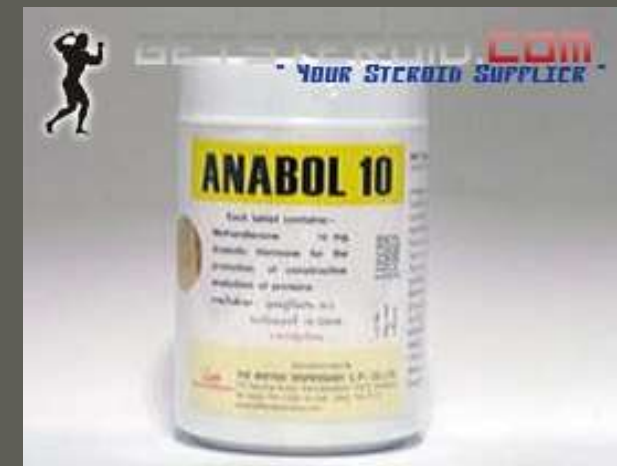
# GBH detection

- GBH leaves the bloodstream after 4-7 h.
- Can still be detected in urine within 24 hours.
- Date Rape Drug Hair Test - detection period 3-6 month
- GBH has no colour, no taste, no odour.



# Anabolic - Androgenic Steroid

- Family of drugs composed of the natural male hormone testosterone and a group of 50 synthetic analogs of testosterone.
- Anabolic effect → muscle building
- Androgenic effect → masculinization
- Anabolic-androgenic steroids ≠ corticosteroids





# Anabolic - Androgenic Steroid

- Initially may induce euphoria and hyperactivity.
- In next phase: increased anger, arousal, irritability, hostility, anxiety.
- 2-15% of abusers experience hypomanic or manic episodes (psychotic symptoms may occur).
- Withdrawal symptoms: depressive mood, anxiety, concern about their bodies' physical state, musculoskeletal pain, headaches.

Symptoms are not life threatening and do not ordinarily require pharmacotherapy.

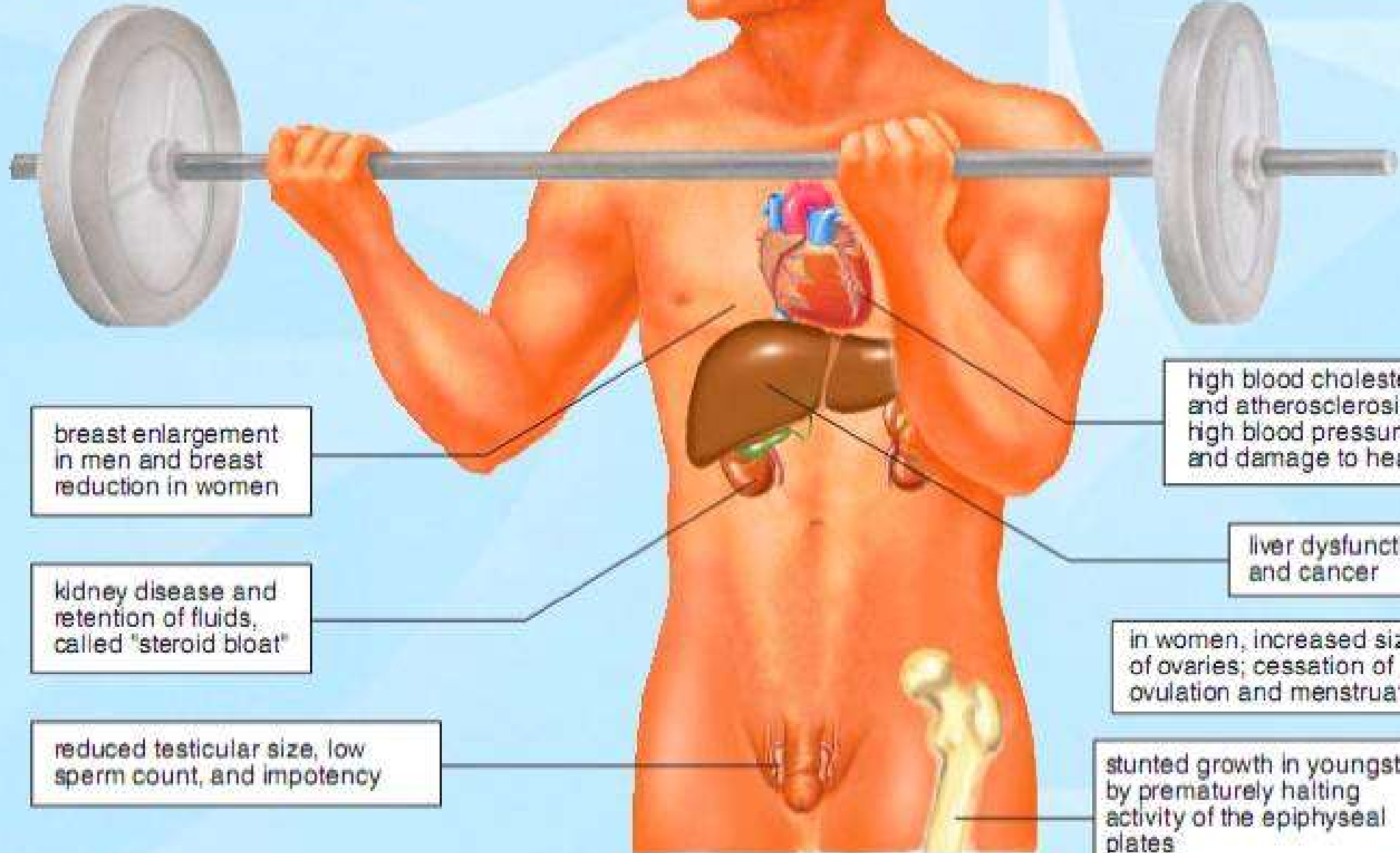
your name

balding in men and women;  
hair on face and chest  
in women

beard and deepening of voice  
in women

roid mania- hostility and  
aggression; delusions and  
hallucinations; depression  
upon withdrawal

severe acne



breast enlargement  
in men and breast  
reduction in women

kidney disease and  
retention of fluids,  
called "steroid bloat"

reduced testicular size, low  
sperm count, and impotency

high blood cholesterol  
and atherosclerosis;  
high blood pressure  
and damage to heart

liver dysfunction  
and cancer

in women, increased size  
of ovaries; cessation of  
ovulation and menstruation

stunted growth in youngsters  
by prematurely halting  
activity of the epiphyseal  
plates



(A) Severe acne conglobata



(B) Lesions include papules, pustules, abscesses and deep ulceration



(C) After 6 weeks of antiseptic-antibiotic therapy

your name

# Legal highs

- Exact chemical composition is not known.
- Natural (*Salvia divinorum*) and synthetic substances (mephedron).
- Serious side effects and lethal somatic complications (including delirium).
- Risk of drug – induced acute psychosis.

# *Salvia divinorum*



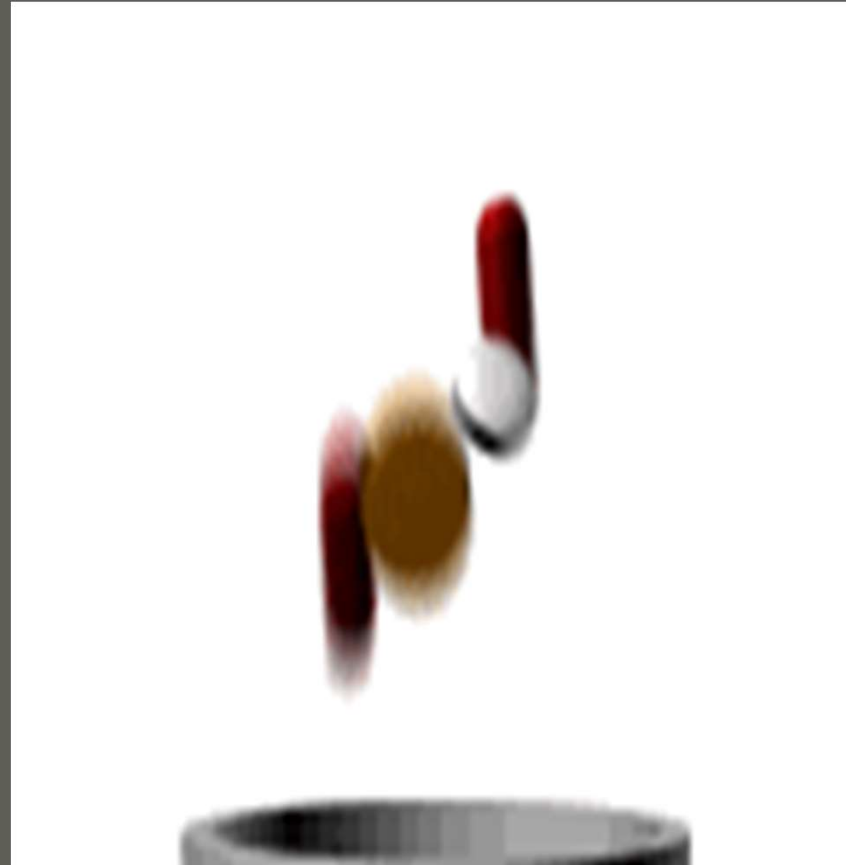
# Clinical management of psychoactive substance use

An acute phase:

- Detoxification
- Treatment of comorbid psychiatric/somatic disorders

The continuation phase:

- Efforts to rehabilitate the patient
- To prevent future use of psychoactive substances



**your name**