Substance Use Disorders

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Introduction

- Many implications for brain research & clinical psychiatry.
- Affect mental state and behavior.
- Sx 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) a social problem

b) a moral problem

c) a criminal problem

d) a primary chronic brain problem

e) a behavioral disorder occur as the result of other causes such as emotional or psychiatric problems.

Addiction is not a choice, but choice still plays an important role in getting help.

Terminology

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Withdrawal: a group of symptoms and signs occurring when the drug is withdrawn or reduced in amount.

Terminology (cont.)

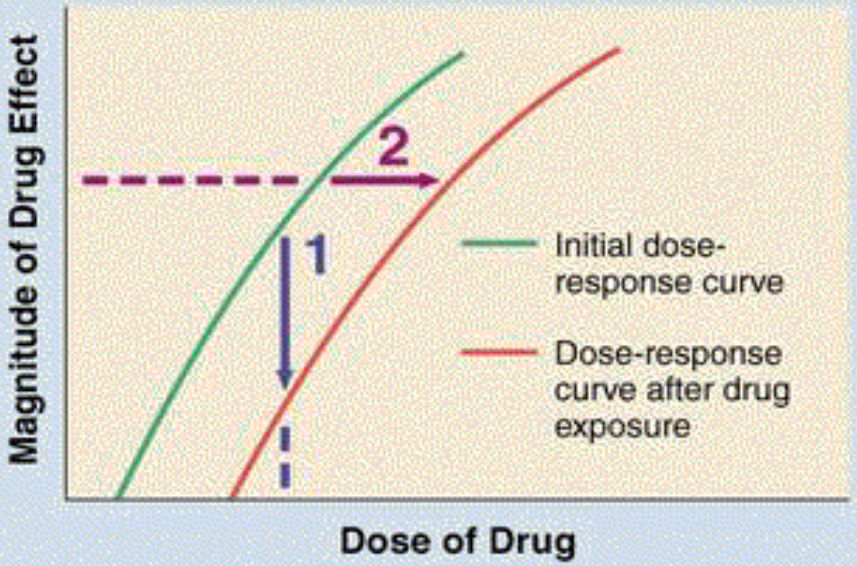
Dependence: the physiological state of neuroadaptation produced by repeated administration of a drug, necessitating continued administration to prevent appearance of withdrawal state.

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

Drug tolerance is a shift in the dose-response curve to the right. Therefore,

1. In tolerant subjects, the same dose has less effect
2. In tolerant subjects, a greater dose is required to produce the same effect



Complications

Basic classification

CNS Suppressants
Alcohol – Sedatives – Inhalants – Opioids**.**

CNS Stimulants: Amphetamine – Cocaine

Cannabis

Assessement

- Collateral history.
- 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 problems).
  - **Dependence?**
- Complications :
  - Psychosocial…..
  - Physical…..

Alcohol and Related Mental Disorders

Alcohol Kills More Than AIDS, TB or Violence-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.

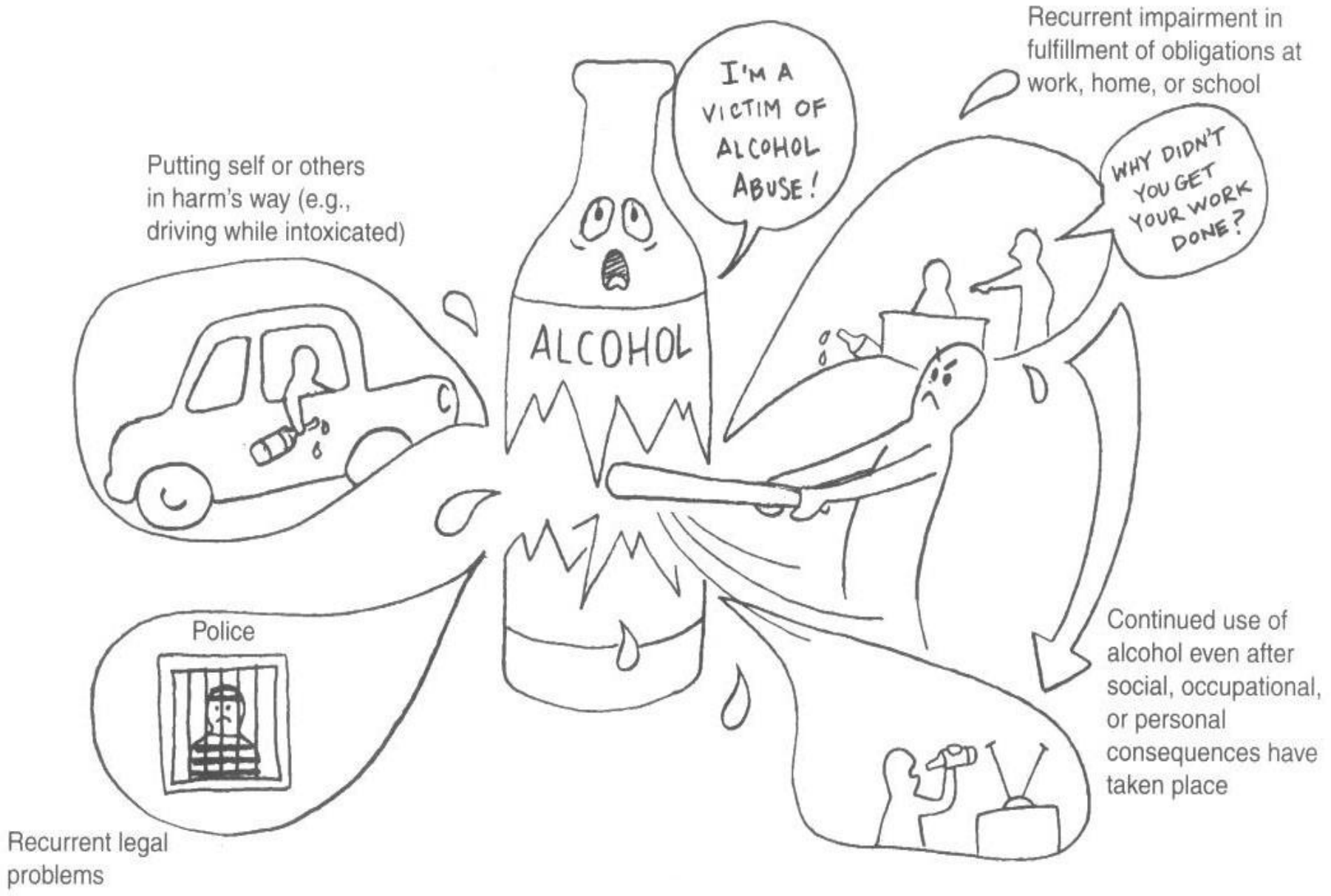
Risk factors of Alcohol abuse

- **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.

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.

Alcohol Abuse



How much is too much?

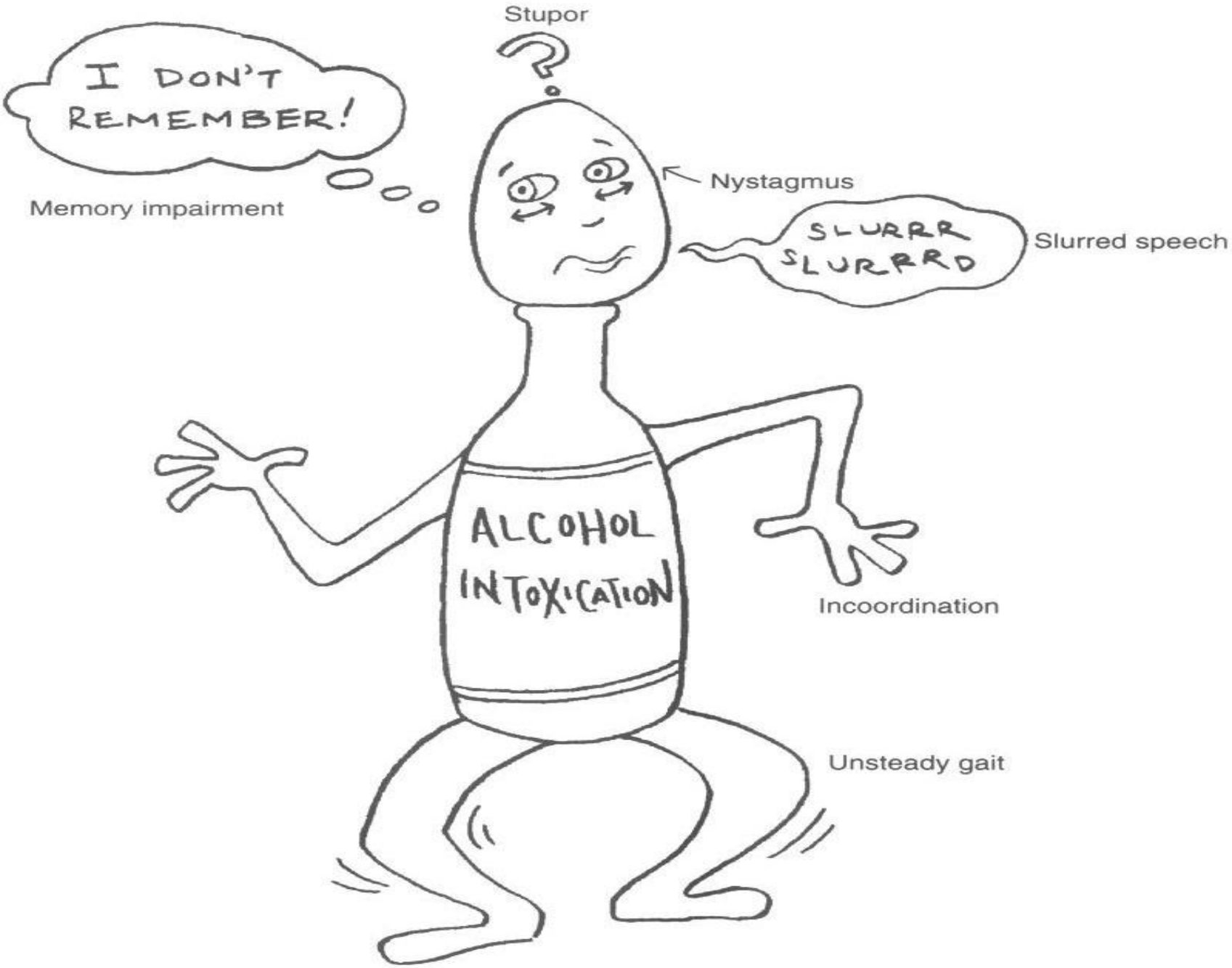
Clinical presentation

- **Alcohol intoxication:** early intoxication includes sense of well-being, emotional lability, irritability and incoordination → to ataxia and slurred speech
- 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 concentrations Vs. CNS effects

Ethanol plasma concentration (mg/dL)	Impairment
	Feeling of relaxation, euphoria
20-30	Slowed thinking
30-80	Motor incoordination
80-200	Cognition, judgement, labilty
200-300	Slurring, ataxia, nystagmus, blackouts
>300	Vital signs, coma, possible death due to the respiratory failure


Stupor
I DON'T REMEMBER!
Memory impairment
Nystagmus
SLURRR SLURRRD
Slurred speech
ALCOHOL INTOXICATION
Incoordination
Unsteady gait

Alcohol dependence

- 15-20 years before evident
- dependence is most common in

those aged 40 – 55 years.

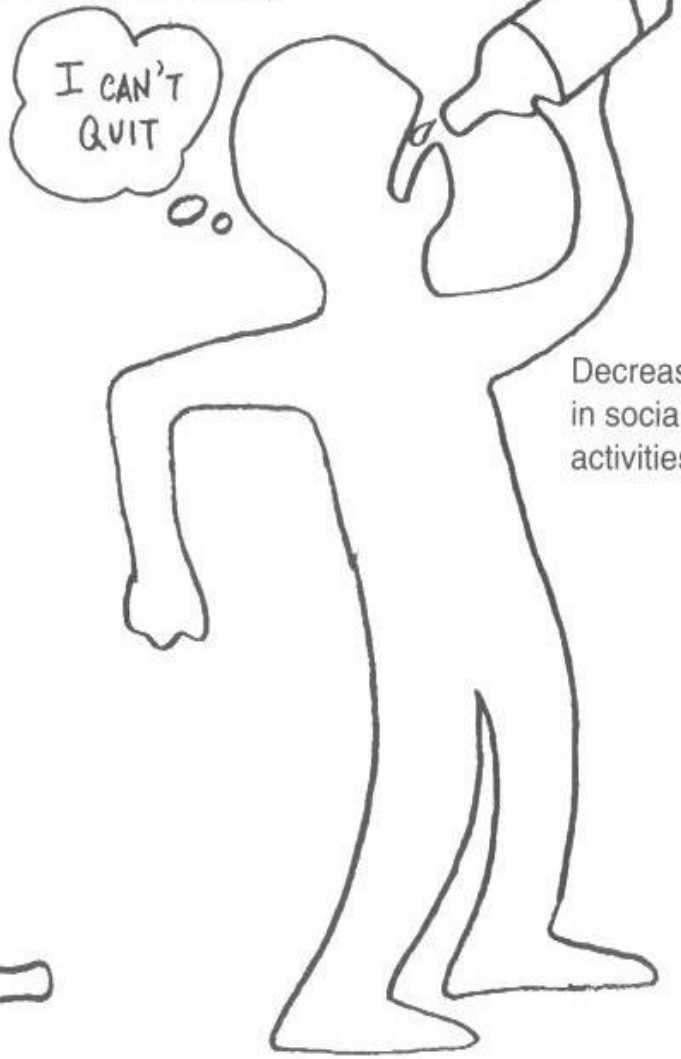
- Alcoholics who continue drinking have a shortened life-span of <u>15 years</u> why?

Complications of chronic alcohol abuse

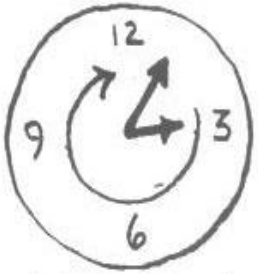
Medical	Psychiatric	Social
Neurological	Amnestic disorder	Social isolation
Cerebral degeneration	Delirium	
Seizures	Dementia	Job loss
Peripheral neuropathy	Psychosis	
Optic nerve atrophy	Depression	Marital conflicts
Alimentary Tumors (esophagus, liver)	Reduced sexual desire	
Gastritis, peptic ulcer	Insomnia	Family problems
Pancreatitis	Personality deterioration	Legal troubles
Hepatitis, liver cirrhosis	Increased risk of suicide	
Cardiomyopathy	Morbid jealousy	Social stigma
Anemia		
Gynaecomastia		

Alcohol Dependence

Repeated failures to stop

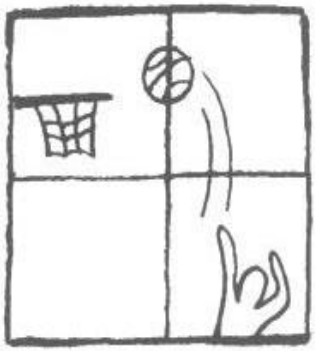


Needs to take substance to avoid withdrawal symptoms



Large amount of time devoted to substance

Decreased involvement in social or recreational activities



Need for increased amounts

Clinical presentation (cont)

- **Alcohol withdrawal:** Sx may begin after 6 hours of cessation or reduction of alcohol and peak by 48 hours, they follow a drop in blood concentration, symptoms 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

Stages of alcohol withdrawal

Stages	Symptoms
• I (6-8 hours):	➢ Autonomic hyperactivity
• II (10-30 hours):	➢ Hallucinations + above
• III (12-48 hours):	➢ Grand mal seizures
• IV (> 2-3 days):	➢ Delerium tremens (DTs)

Laboratory Tests

- Identify acute and/or heavy drinking (≥ 5 drinks/day):
  - ❑ Blood Alcohol Levels (BAL).
  - ❑ Gamma-glutamyltransferase (GGTP > 35 IU/L)
  - ❑ Erythrocyte mean corpuscular volume (MCV >91.5 μ^3)
  - ❑ High AST/ALT

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"*** to prevent the shakes?

Treatment

- **Treating Alcohol Intoxicated Patient:**

Conscious : supportive, antipsychotic if agitated. Unconscious: ABC

- **Treating Alcohol Withdrawal:**

Supportive, thiamine & long acting BDZ ± anticonvulsants for seizure.

- **Maintaining Abstinence:**
  - **Disulfiram** – blockade of aldehydedehydrogenase → cummulation of acetaldehyde - nausea, flushing, tachycardia, hyperventilation, panic…
  - **Naloxone** – reduces alcohol-induced reward.
  - **Acamprosate** – anti-craving effects .
- **Psychological:** Individual, group Rx, relapse prevention.

- **Delirium Tremens (DTs):**

Severe form of alcohol withdrawal after 2-3 days:

- gradual onset of delirium and gross tremors

Other features:

- autonomic disturbance
- dehydration and electrolyte disturbance
- insomnia

- Peaks on 3rd or 4th day and lasts 3-5 days, worsens at night and followed by a period of prolonged deep sleep from which the person awakes with no symptoms and has amnesia for the period of the delirium.

- **Complications include:**

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

Causes:

1. Volume depletion
2. Cardiac arrhythmias
3. Electrolyte imbalance
4. Infections

Treatment

1. DT is a serious MEDICAL emergency → detection and treatment – ICU or medical ward
2. Avoid antipsychotics
3. Guard against seizures
4. Rehydration
5. Thiamine (B1)
6. Adjust surroundings

Sedatives, Hypnotics, and Anxiolytics

- Similar clinical manifestations and withdrawal to alcohol.
- Risk of cross-tolerance and cross-dependence?
- Withdrawal depends on substance
- BDZ have a large margin of safety & less addiction potentials.
- **Flumazenil** is a BDZ receptor antagonists used in BDZ overdose.

OPIOIDS

1. **Opium**
2. **Heroin**
3. **Morphine**
4. **Codeine**
5. **Pethidine**
6. **Methadone**

- naturally occurring (e.g. opium, codeine) or synthetic or semi-synthetic
- medical use like pethidine or substance of abuse like heroin
- The medical use of opioids are mainly for there powerful analgesic effect - while they are abused for they are euphoriant effect

Opiod intoxication

Presentation	Treatment
Euphoria Relaxation Anelgesia Disturbed consciousness Small pupil (initially) Bradycardia Reduced appetite Constipation Respiratory depression	ICU: Monitoring Naloxone Open airway – oxygen – IV fluids

Opioid withdrawal

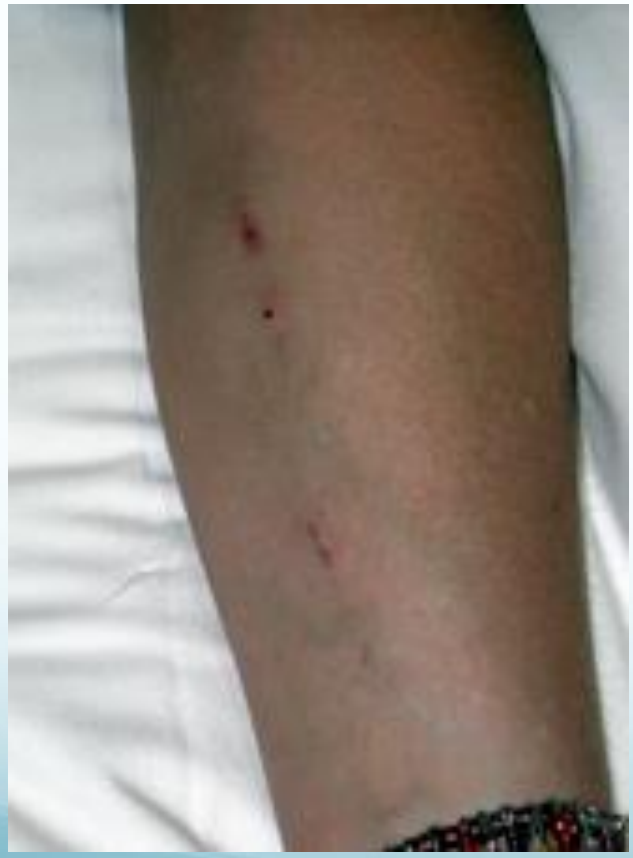
Presentation	Treatment
1. Lacrimation, rhinorrhea & yawning 2. Dysphoric mood 3. Insomnia 4. Muscle and joint aches 5. Cold and hot flushes 6. Nausea, vomiting and diarrhea 7. Fever, sweating, piloerection	Short-term: Painkillers, sedatives, observation Clonidine Long-term Harm reduction strategies Methadone Buprenorphine/Naloxone

Intense craving begins 6 hours after the last dose and peaks after 36-48 hours

Untreated withdrawal result in no serious medical sequence - but they cause great distress

Tolerance can develop very rapidly (esp. in IV use) leading to increasing dosage - then it diminishes very rapidly

Complications of injecting



- Bacterial, local and systemic
- Blood-borne viruses
- Vascular damage

- In this case:
  - Track marks
  - Early cellulitis
  - Multiple injections over a short period suggests cocaine use

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

Inhalants

- Volatile organic substances –acetone, benzene, etc.
- Brain depressants
- Adolescents – experimentations
- Intoxication – similar to other brain suppressants
- Complications:
  - Physical: multiple organ damages

- 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.

Psychostimulants

Commonly used Stimulants

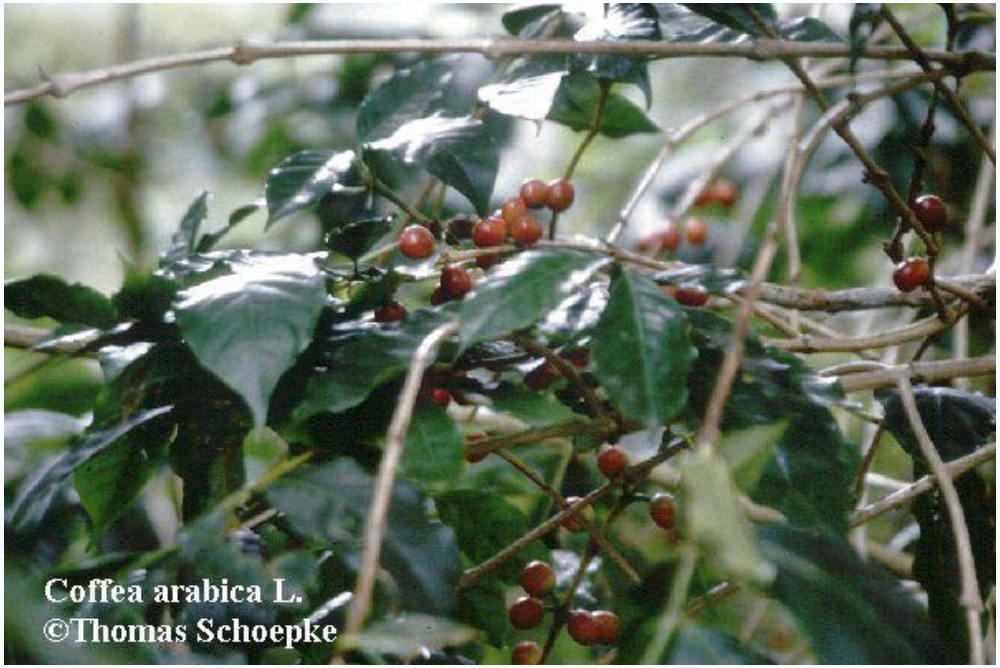
- Nicotine
- Caffeine
- Cocaine – Freebase/crack
- Amphetamine/Methamphetamine
- Methylenedioxymethamphetamine (MDMA)
- Appetite suppressants
  - (e.g. phentermine and diethylpropion)

Psychological FX of non dependent use

- Recurrent intoxication
- Some users may self-medicate with antidepressants and/or benzodiazepines
- After-effects: termed ‘crash’ or ‘come down’
  - Dysphoria
  - Depressed mood
  - Anxiety
  - Reduced appetite
  - Restlessness

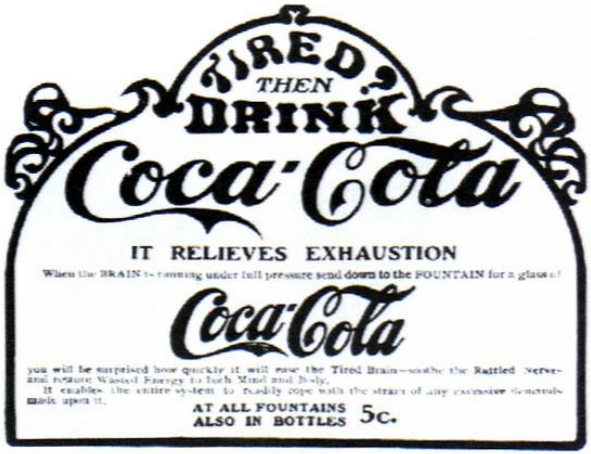
Clinical effects of stimulants

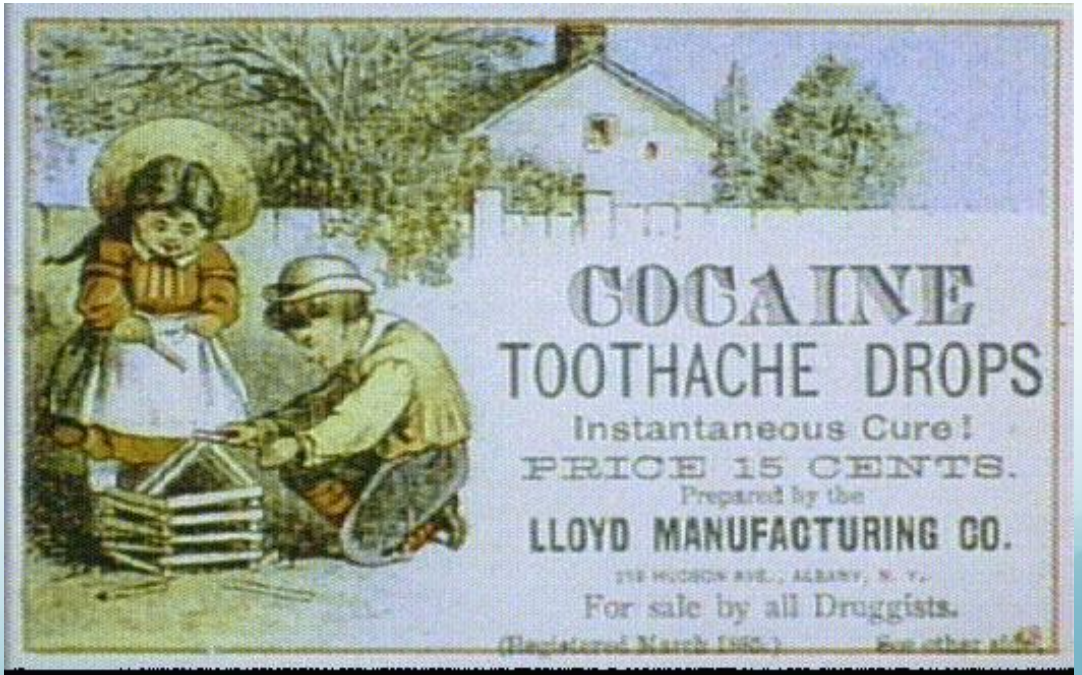
Psychological	Physical
Enhanced cognitive function Elevated mood Over activity Increased confidence, self-esteem and sociability Overtalkativeness Insomnia **In high doses/prolonged use:** Restlessness, irritability Paranoid psychosis, hallucinations (visual) Aggressiveness, hostility	Reduced sense of fatigue Reduced appetite (anorexia) Dilated pupils Tremors **In high doses/prolonged use:** Nausea, vomiting, hyperthermia, cardiac arrhythmias, severe hypertension, CVA, seizures Dizziness, respiratory distress,


Coffea arabica L.
©Thomas Schoepke


Cocoa Fruit (leaves not from cocoa) - Hilo Hawaii
photo by Erowid, ® 2001 erowid.org


Erythroxylum coca
Erythroxylaceae
George K. Linney

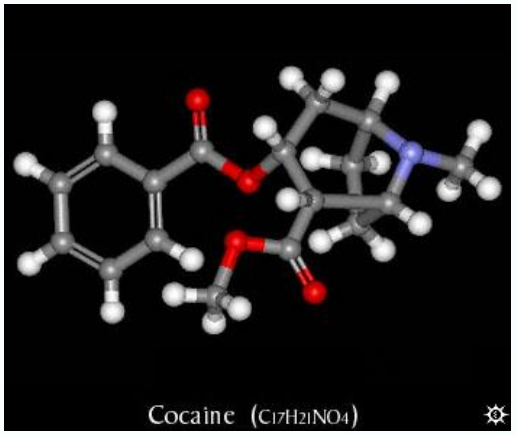


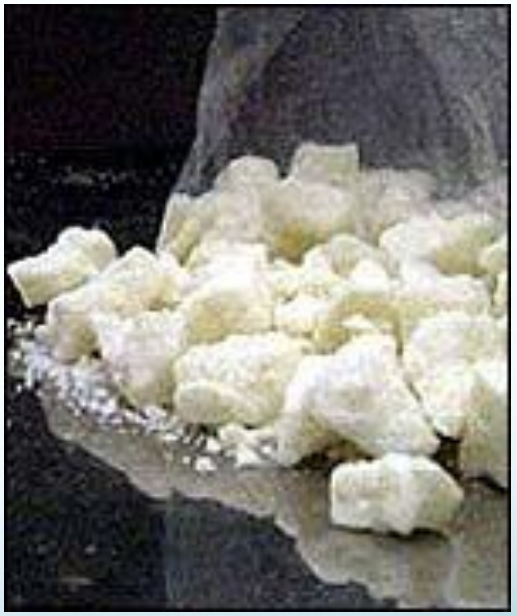


1885 Advertisement for Cocaine Toothache Drops

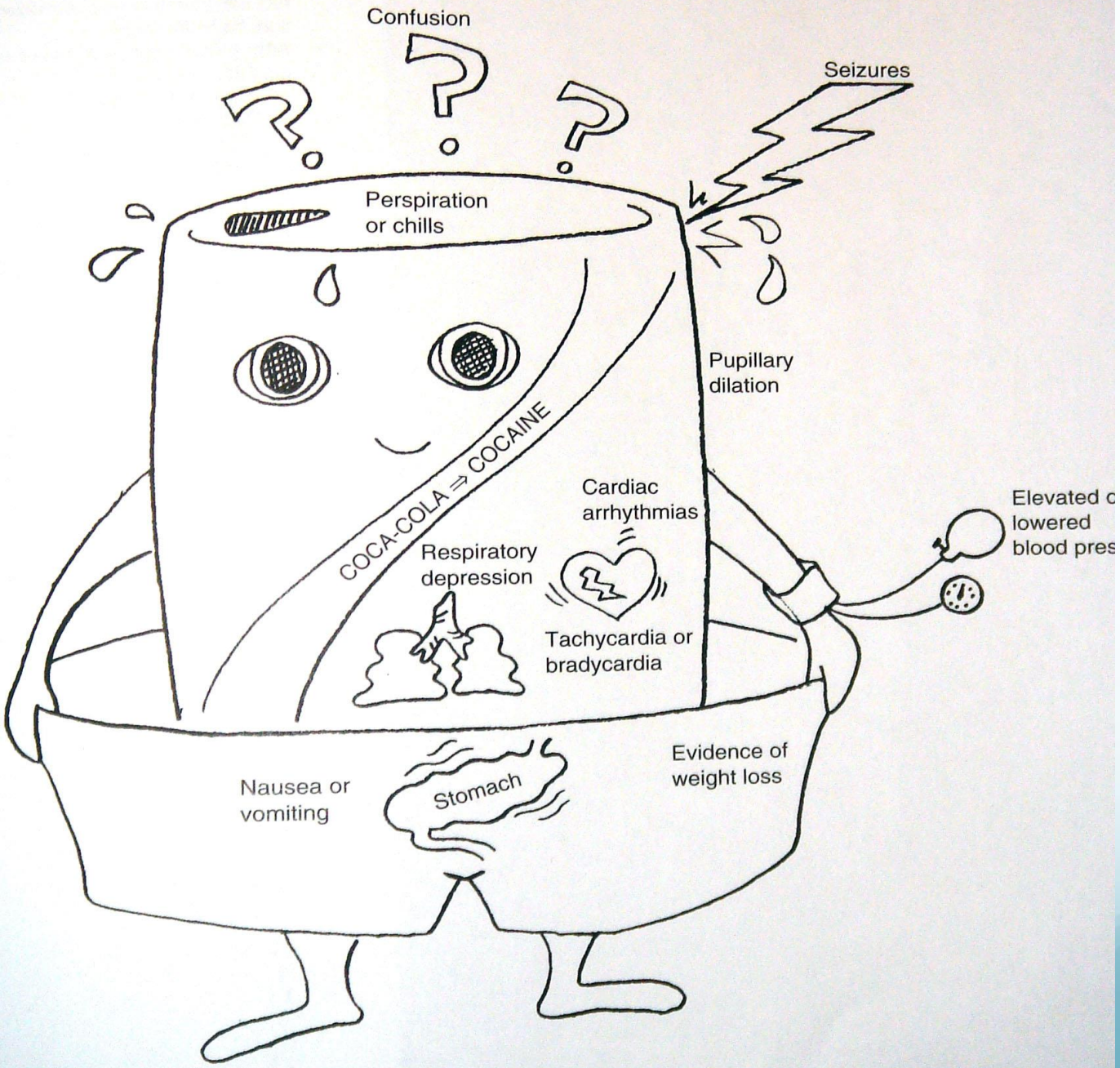
Cocaine

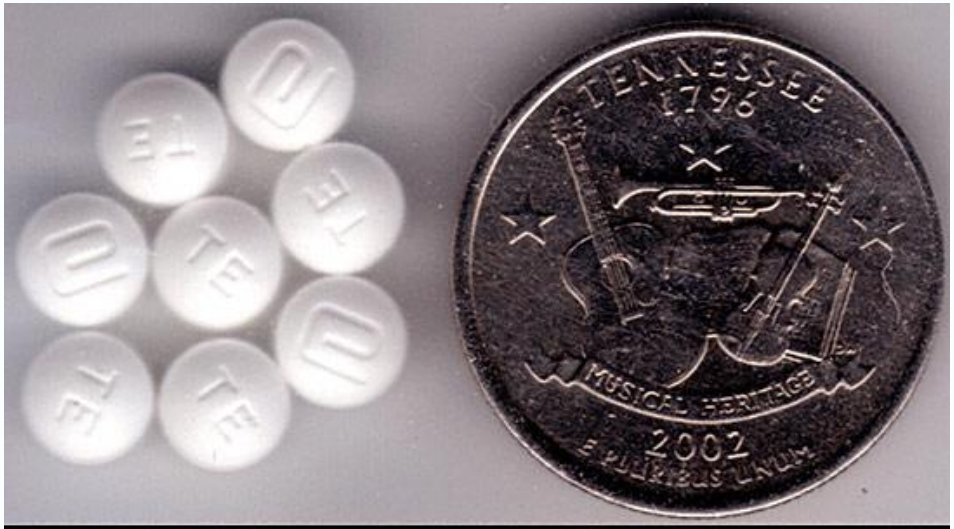
- Forms of cocaine:
  - Free base
  - Crack
- Routes of use:
  - Intranasal
  - Intravenous/SC



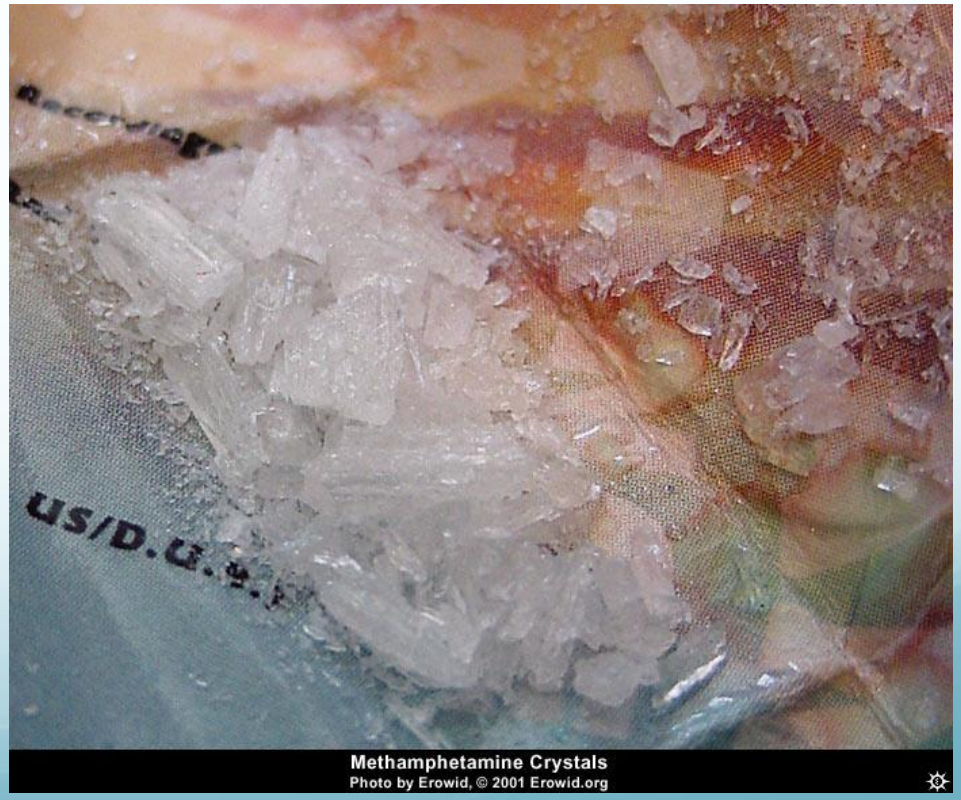


Crack cocaine


Confusion
Seizures
Perspiration
or chills
Pupillary
dilation
COCA-COLA ⇒ COCAINE
Cardiac
arrhythmias
Respiratory
depression
Tachycardia or
bradycardia
Elevated o
lowered
blood pres
Nausea or
vomiting
Stomach
Evidence of
weight loss

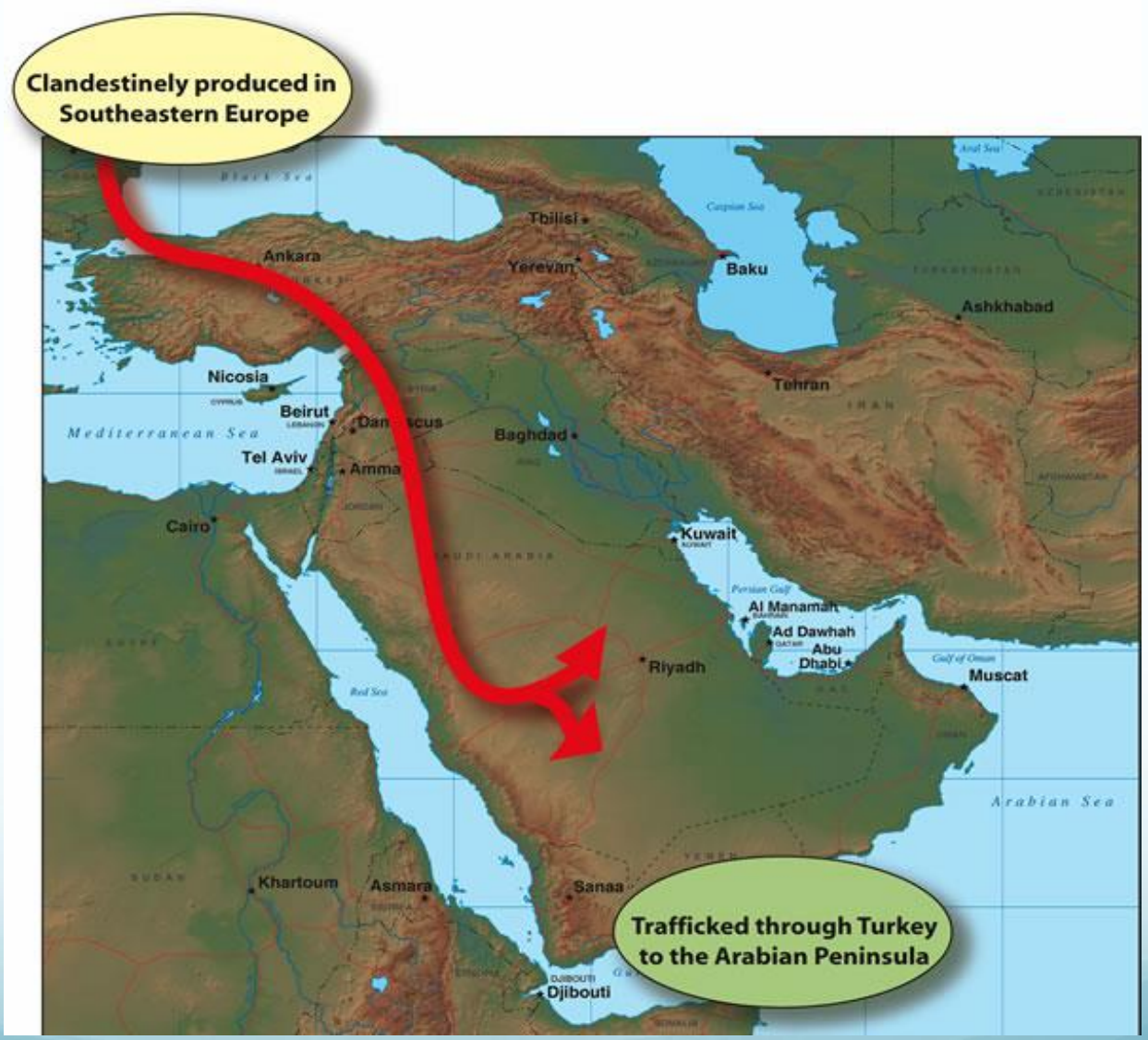


Desoxyn (Methamphetamine) Tablets
Anonymous Photographer, © 2002 Erowid.org



Methamphetamine Crystals
Photo by Erowid, © 2001 Erowid.org

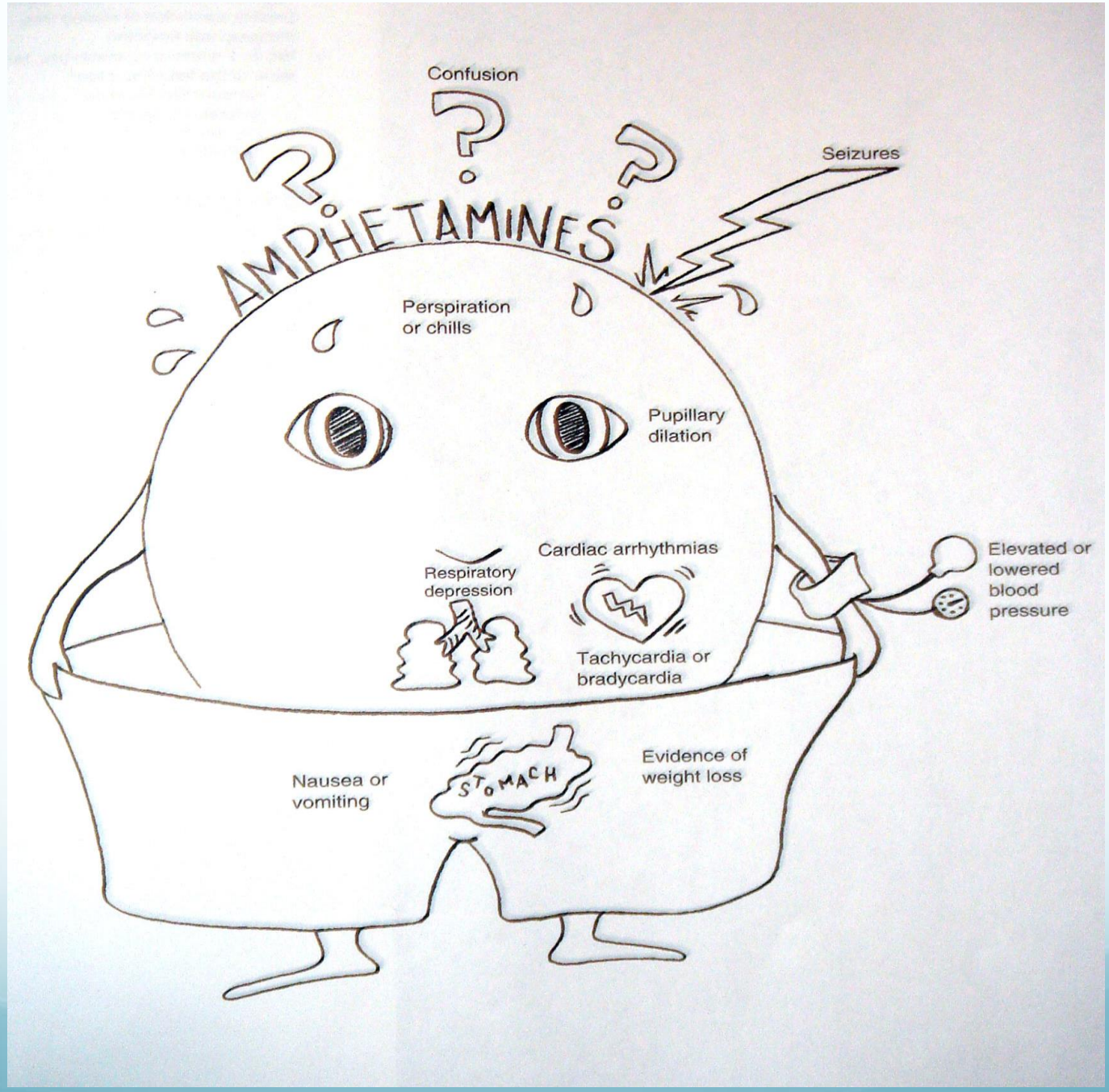
Captagon (Fenethylline)



Other uses for amphetamines

Globally and historically, probably most common use crosses social and occupational boundaries

	Driver	Student	Women	Sports
Euphoria	+	+	+	+
Energy	++	++		++
Concentration	++	++		++
Reduction of hunger			++	
Sexual function/ libido			++	


Confusion
AMPHETAMINES
Seizures
Perspiration or chills
Pupillary dilation
Cardiac arrhythmias
Respiratory depression
Elevated or lowered blood pressure
Tachycardia or bradycardia
Nausea or vomiting
STOMACH
Evidence of weight loss

Treatment

- Symptomatic use of antipsychotic
- Antidepressant sometimes useful
- Psychotherapy (individual, family & group)

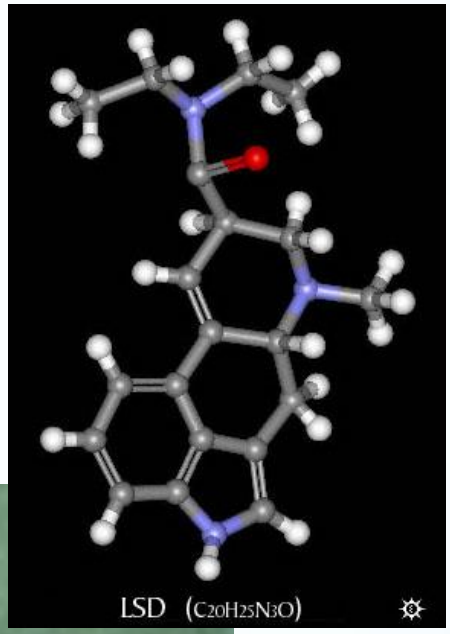
Hallucinogens

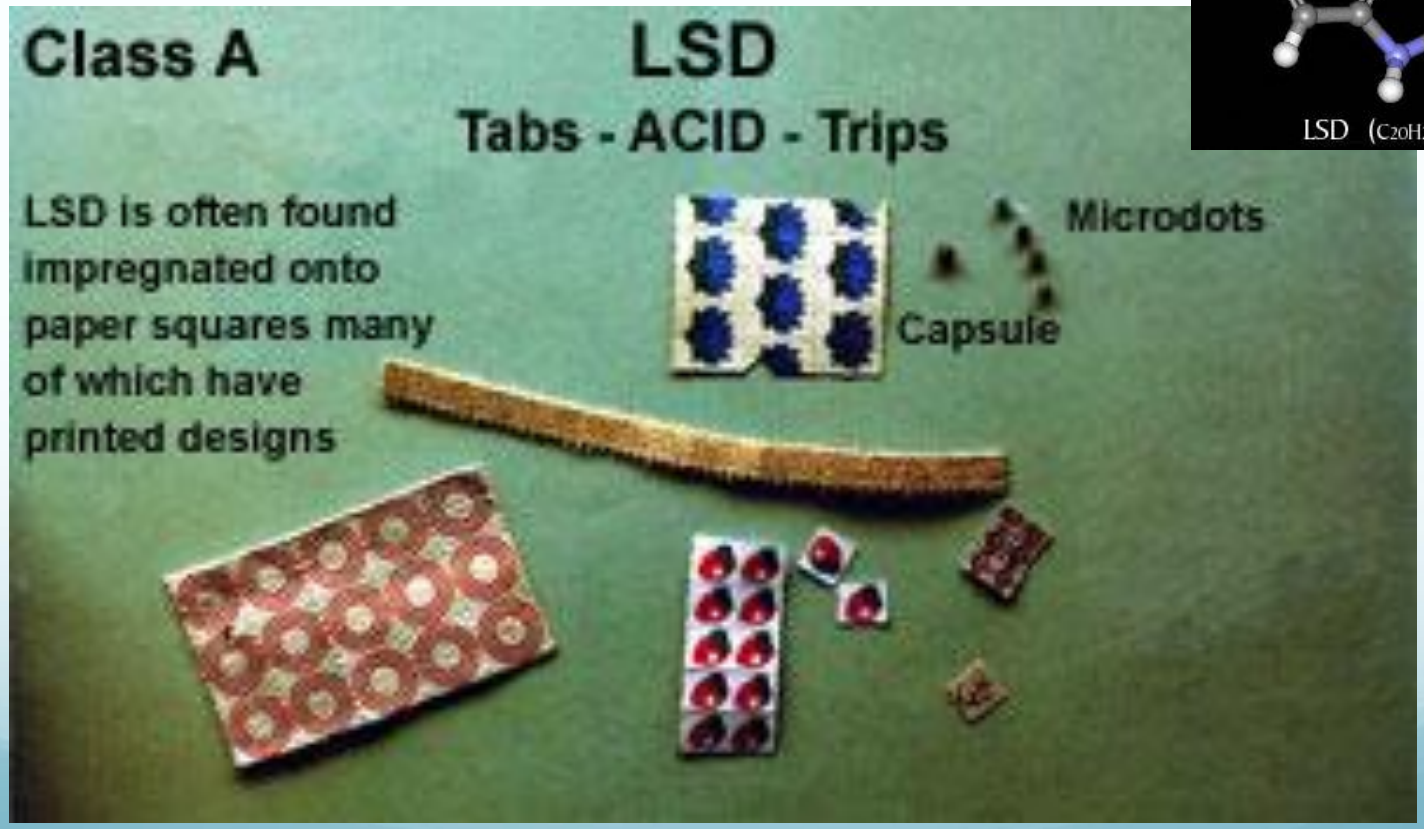
- These are group of substances that induce hallucination and produce loss of contact with reality
- Natural and synthetic substances that are also called *psychedelics* or *psychotomimetics*
- Natural e.g. psilocybin (magic mushroom) or synthetic like lysergic acid diethylamide (LSD)
- No medical use and high abuse potential

Clinical effects

Psychological	Physical
Marked perceptual distortion (changing shapes and colors) Hallucination (visual and tactile) False sense of achievement and strength Euphoria, anxiety, panic Paranoid ideation Homicide and suicide tendencies Flashbacks Delirium	Tachycardia Hypertension Cerebellar signs Wide pupils Hyperemic conjunctiva Blurred vision Hyperthermia

Lysergic Acid Diethylamide (LSD)





3 Forms of LSD

Effects of LSD

Effects of drug come on in about 30 min

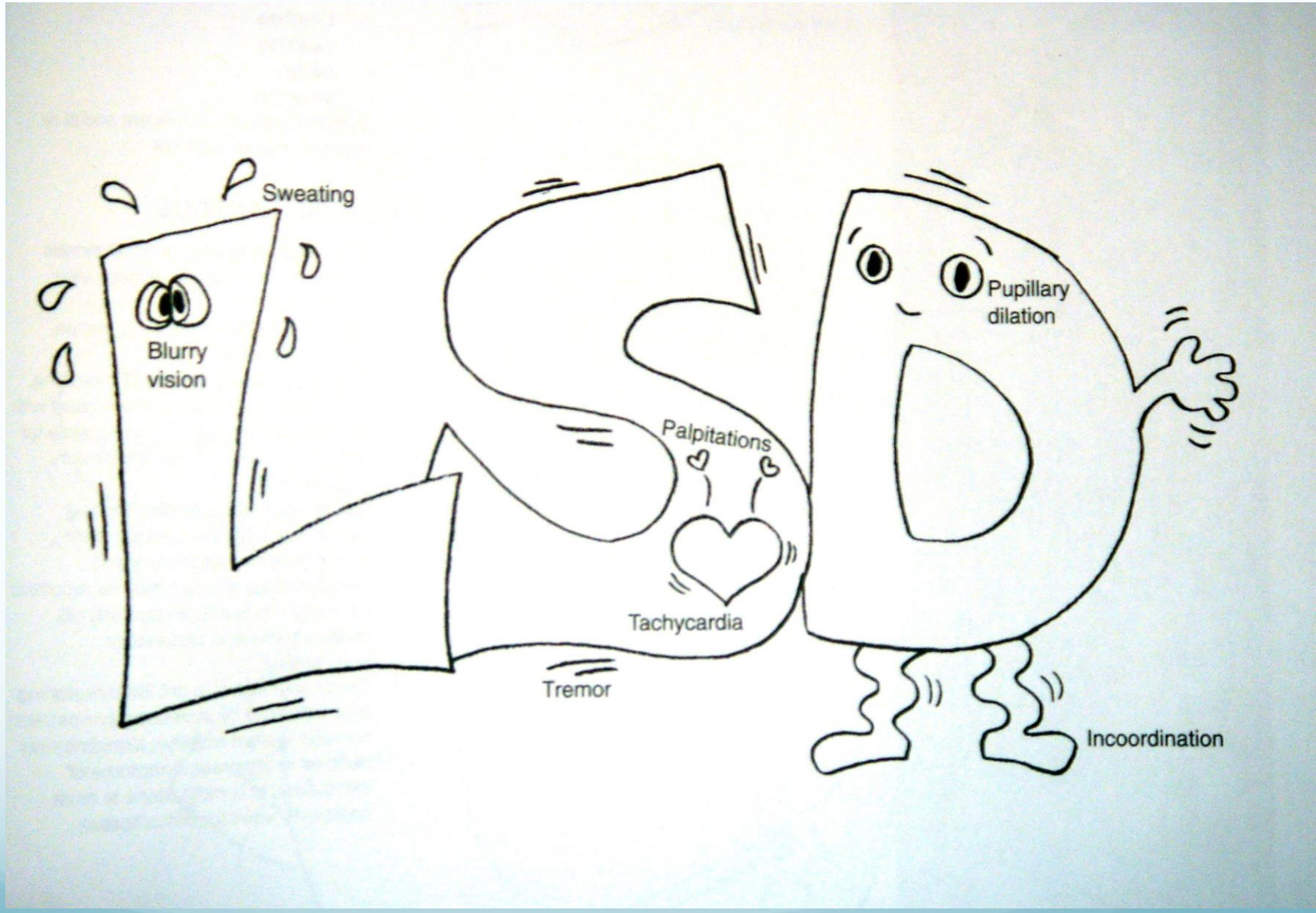
- first signs are autonomic activation
- followed by overt behavioral signs - loosening of emotional inhibitions
  - giddiness, laughter for no reason
  - mood euphoric and expansive, but labile mood swings notable
- abnormal color sensations, luminescence
- colors reported as more brilliant

Effects of LSD

- 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 withdrawal either
- Problems related to the things people do while under the influence
  - Accidents
  - Suicide
  - Aggression/violence
  - Toxic reactions


Sweating
Blurry vision
Palpitations
Tachycardia
Tremor
Pupillary dilation
Incoordination

CANNABIS

- 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.

What is Cannabis (marijuana)?

Cannabis sativa.

- psychoactive cannabinoids, (delta9-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.

What are the acute effects?

- 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 to1h.
- 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.

What are the acute effects?

- 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

Effect on physical health?

- 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

- 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

- 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:
  - Heroin abuse.
  - Benzodiazepines abuse.
  - Methadone abuse.
  - Abuse of painkillers.

- 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:
  - Cannabis abuse.
  - Methadone intoxication.
  - Abuse of naloxone.
  - Opioid withdrawal.

- 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:
  - Heroin abuse.
  - Generalized anxiety disorder.
  - Amphetamine abuse.
  - Paranoid Schizophrenia.

- A 43-year-old man has episodic behavioral disturbances including; euphoria, talkativeness, and disinihibition.

His eyes look red most of the time. The most likely diagnosis is:

- Alcohol abuse.
- Cannabis abuse.
- Amphetamine abuse.
- Cocaine abuse.

- 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:
  - Cannabis.
  - Alcohol.
  - Volatile substance.
  - Morphine.