BEHAVIORAL SCIENCES

MD3

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SUBSTANCE ABUSE DISORDER

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Learning Objectives

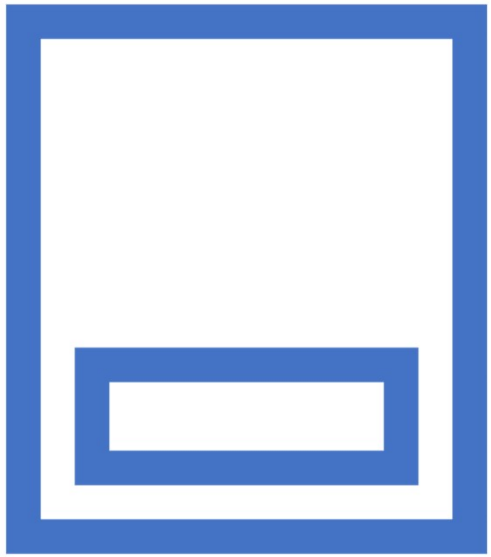
❑❑ Demonstrate understanding of how alcoholism and tobacco use relate to mortality

❑❑ Demonstrate understanding of how genetics relates to alcoholism and tobacco use

❑❑ Answer questions about the physiology of addiction

❑❑ Answer questions about how substance use disorders can affect pregnancy

❑❑ Demonstrate understanding of how to diagnose and treat a substance use disorder



SUBSTANCE ABUSE DISORDER

ALCOHOL AND TOBACCO USE

Alcoholism is the most expensive health problem in the United States, costing >$100 billion/year for alcohol-related illness and death. Tobacco, however, accounts for more loss of life. The best way to reduce long-term mortality is to eliminate smoking.

SUBSTANCE ABUSE DISORDER

Alcohol is most abused drug for all ages; ~10% of all adults are problem drinkers (men > women).

• Alcohol is most widely used illicit drug for teenagers (marijuana is most widely used illicit drug overall).

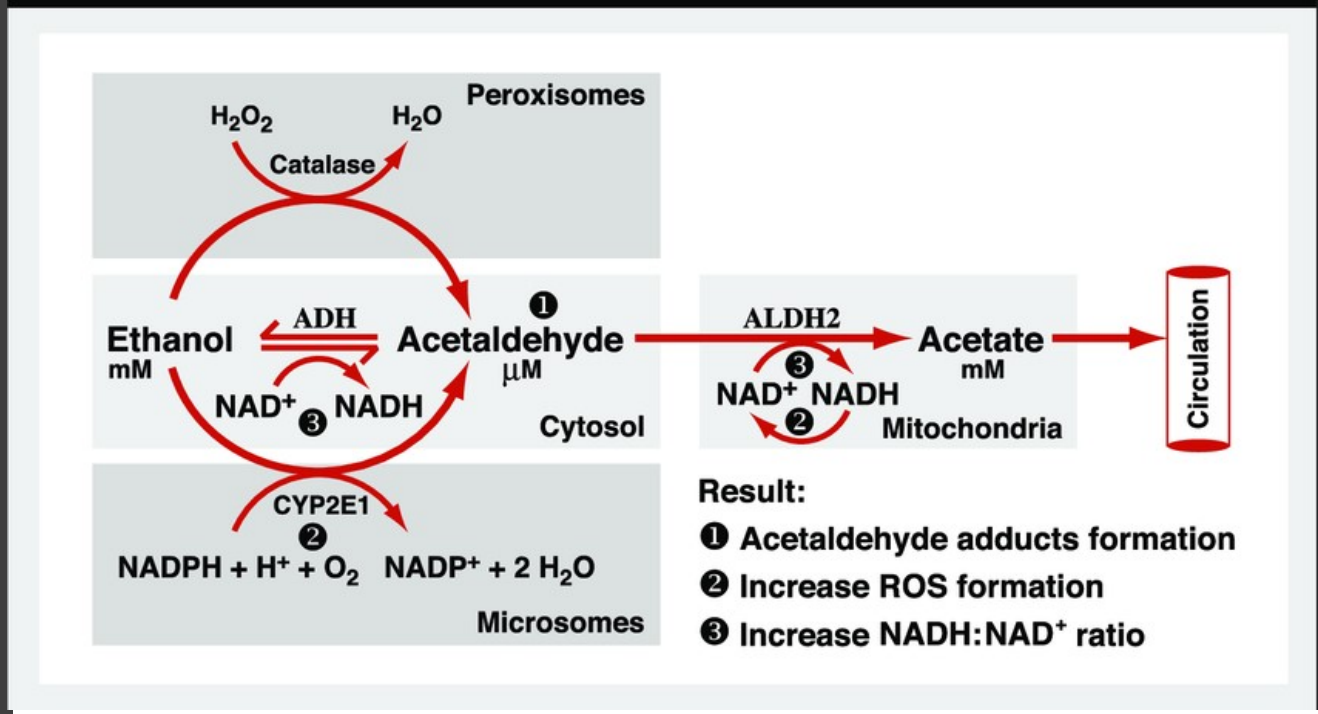
• Binge drinking is becoming more common; proportion of heavy drinkers age <20 has increased.

• Alcoholism rates are higher for low-SES groups, though they recover sooner.

• Alcohol use has been implicated in 15% of all car accidents, and in 50% of all MVAs not involving a pedestrian, auto accident deaths, homicides (killer or victim), and hospital admissions.

SUBSTANCE ABUSE DISORDER

Alcohol metabolism



SUBSTANCE ABUSE DISORDER

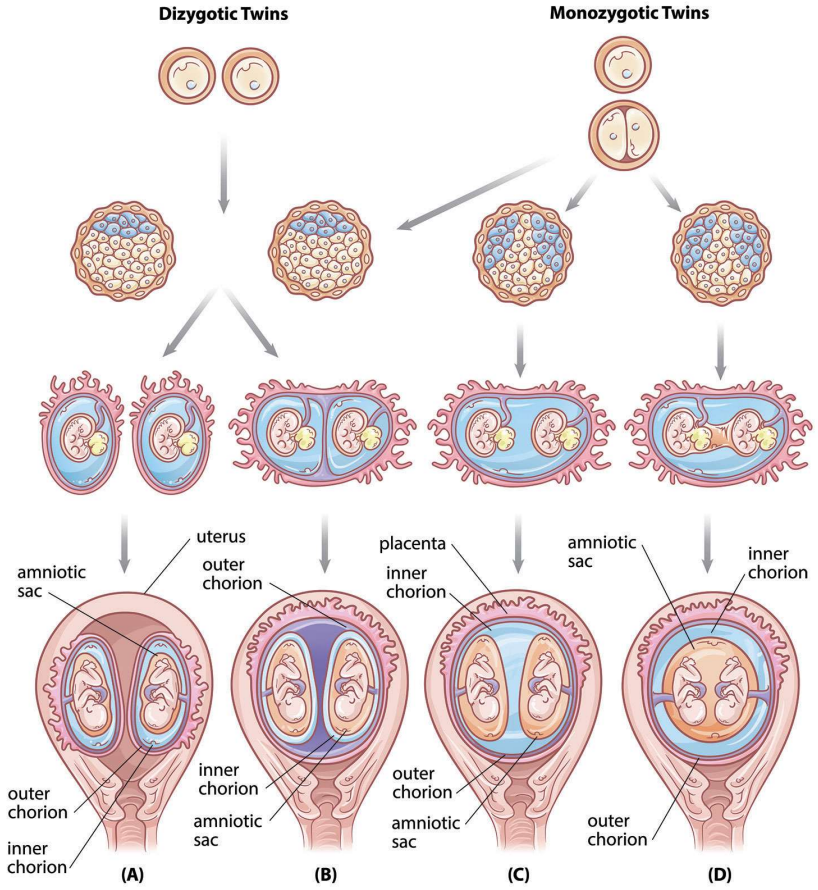
GENETICS

Can we blame drinking on inheritance?

- Concordance rates are higher for monozygotic versus dizygotic twins.
- Twins born to alcoholic parents and raised by non-alcoholic parents are more likely to become alcoholics. If biologic father was an alcoholic, the incidence of alcoholism in men adopted into non-alcoholic families is equal to the incidence of alcoholism in sons raised by biologic alcoholic fathers.
- Family history of alcoholism increases likelihood of major depression in offspring.

SUBSTANCE ABUSE DISORDER

Twins



SUBSTANCE ABUSE DISORDER

PHYSIOLOGY

The addiction pathway in the brain is the mesolimbic dopamine pathway.

Activation of this pathway accounts for the euphoric feelings of substance abuse which are positively reinforcing and increase the likelihood of subsequent use and potential addiction.

Neurotransmitters involved in the addiction pathway include dopamine, which increases desire for stimulus, and serotonin, which gives the body the impression of satisfaction, so cravings are reduced.

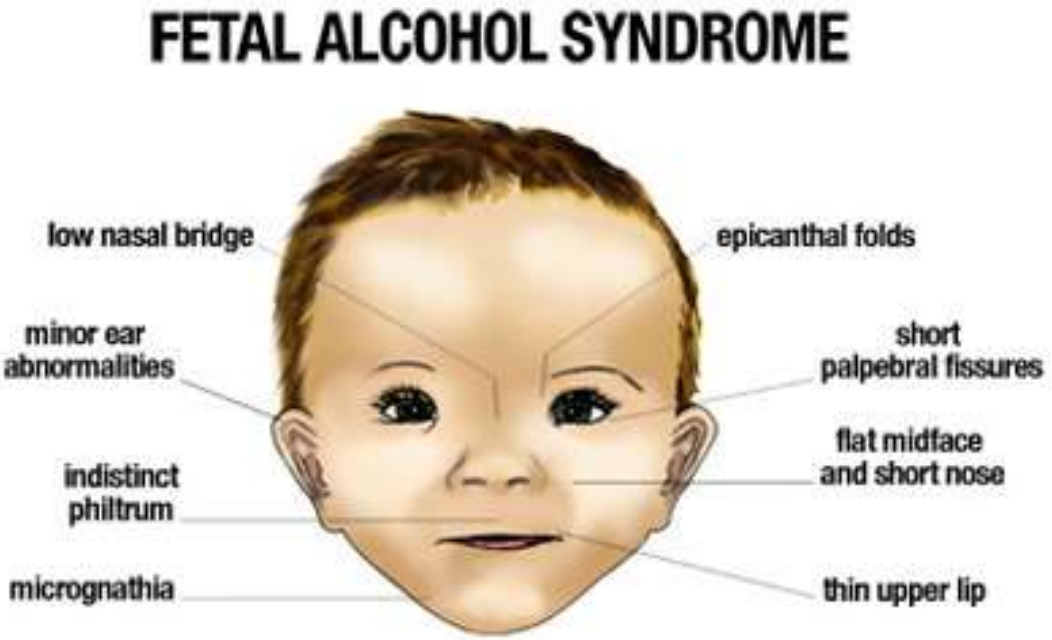
SUBSTANCE ABUSE DISORDER

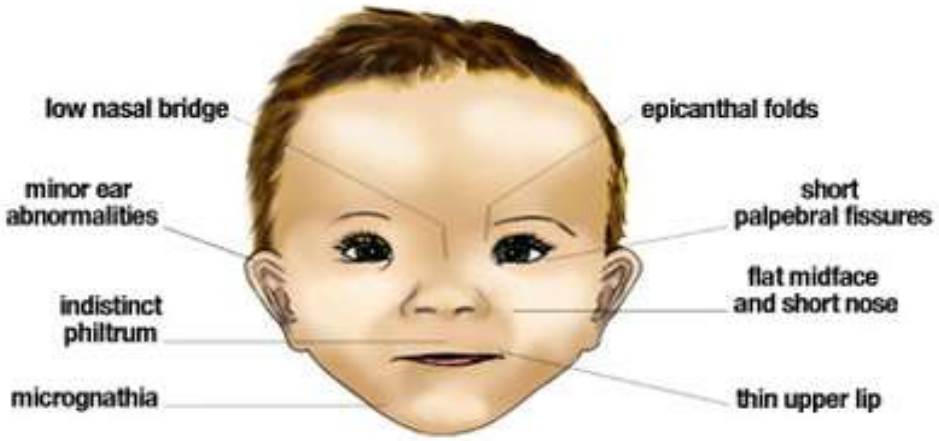
PREGNANCY

Women are encouraged to stay away from drugs and alcohol during pregnancy because of complications related to the drug/alcohol use. Drinking between weeks 6–9 (when some women might be unaware, they are pregnant) is most likely to lead to facial abnormalities associated with **fetal alcohol syndrome** (FAS). FAS can cause growth problems, mental or behavioural problems, and abnormal facial features.

SUBSTANCE ABUSE DISORDER

Fetal alcohol syndrome





SUBSTANCE ABUSE DISORDER

Fetal alcohol syndrome

SUBSTANCE ABUSE DISORDER

DIAGNOSIS AND MANAGEMENT

Self-Awareness

Most substance users do not believe they have a problem. Denial and rationalization become their main defense.

• Many substance abusers' function in society, so it is hard for them to acknowledge they have a problem related to drug and alcohol.

Typically, something significant (e.g., “hit rock bottom”) has to happen to them in order to realize there is a problem. The CAGE questionnaire is a widely used **screening test** for problem drinking and potential alcoholism.

• Have you ever tried to **C**ut down on alcohol intake and not succeeded?

• Have you ever been **A**nnoyed about criticism concerning your drinking?

• Have you ever felt **G**uilty about your drinking behaviour?

• Have you ever had to take a drink as an **E**ye-opener in the morning to relieve the anxiety and shakiness?

SUBSTANCE ABUSE DISORDER

There are common stages by which people tend to change their behaviour.

- Precontemplation: unaware of problem
- Contemplation: aware of problem but ambivalent about action
- Preparation: first decision to change; small steps taken
- Action: change begins; trial and error
- Maintenance: new behaviors practiced; focus on relapse prevention
- Relapse: efforts to change abandoned

SUBSTANCE ABUSE DISORDER

The cycle may repeat until sobriety is established.
Alcohol abuse can cause many medical complications: cirrhosis, alcoholic hepatitis, pancreatitis, gastric or duodenal ulcer, esophageal varices, middle age onset of diabetes, gastrointestinal cancer, hypertension, peripheral neuropathies, myopathies, cardiomyopathy, cerebral vascular accident, erectile dysfunction, vitamin (thiamine) deficiencies, pernicious anemia, and brain disorders including Wernicke-Korsakoff syndrome. Chronic alcohol use can lead to cognitive decline.

- Laboratory evidence of alcohol use will include:
  - Increased transaminases (AST/ALT) (typically 2:1 ratio)
  - Increased bilirubin
  - Increased gamma GT (recent alcohol intake)
  - Breathalyzer
  - Blood alcohol level

SUBSTANCE ABUSE DISORDER

DIAGNOSIS
Diagnoses will be of both intoxication with and withdrawal from drugs and alcohol. Oftentimes the diagnosis is clinical. Confirm with urine and blood toxicology screens.

- Alcohol Intoxication: impairment due to acute drug use.
- Alcohol Withdrawal: effects of cessation or reduced drug use once patient develops tolerance for the drug (tolerance is the diminished efficacy of a drug after repetitive use; requires increased dosage for the same effect)
- Substance use disorders may have legal ramifications: driving under the influence (DUI) or driving while intoxicated (DWI). Use disorders include the presence of cravings, tolerance, withdrawal, continued use despite adverse consequences, negative impact on home, work and social settings

SUBSTANCE ABUSE DISORDER

TREATMENT
* Drugs (e.g., naltrexone, acamprosate) to block reward center for alcohol use disorders
* Alcoholics Anonymous (AA), the original 12-step program and largest source of alcohol treatment in the United States
* Narcotics Anonymous (NA) for other drugs
* Al-Anon, for family and friends deal with codependency and enabling behaviors
* Behavior modification techniques (e.g., aversive conditioning), where disulfiram is given to reduce alcohol use

SUBSTANCE ABUSE DISORDER

Treatment Options for Substance Abuse
Disulfiram may work as an adjunct to psychosocial treatment to reduce alcohol use. Patients must be able committed to maintaining abstinence and to taking the medication.

SUBSTANCE ABUSE DISORDER

Substance: Phencyclidine (PCP)
Signs & Symptoms of Intoxication: Belligerence, psychomotor agitation, violence, nystagmus, hypertension, seizures
Treatment of Intoxication:
- Place in quiet room
- Antipsychotics
- Benzodiazepines

Signs & Symptoms of Withdrawal: Elevated body temperature, seizures, and muscle breakdown, Muscle twitching, agitation, and hallucinations may also occur
Treatment of Withdrawal: Benzodiazepines, antipsychotics
Location/Effect of Drug Action: Antagonist of N-methyl D-aspartate glutamate receptors

SUBSTANCE ABUSE DISORDER

Substance: Amphetamine *cocaine
Signs & Symptoms of Intoxication: Euphoria, hypervigilance, autonomic hyperactivity, weight loss, pupillary dilatation, perceptual
disturbances
Treatment of Intoxication: Antipsychotics and benzodiazepines, antihypertensives
Signs & Symptoms of Withdrawal: Anxiety, tremors, headaches, increased appetite, depression, risk of suicide
Treatment of Withdrawal: If suicidal, consider antidepressants
Location/Effect of Drug Action: Mesolimbic pathway, nucleus accumbens

SUBSTANCE ABUSE DISORDER

Substance: Cannabis
Signs & Symptoms of Intoxication: Impaired motor coordination, slowed sense of time, social withdrawal, increased appetite, conjunctival injection, psychosis
Treatment of Intoxication: Antipsychotics if needed Irritability, anxiety
Signs & Symptoms of Withdrawal: Irritability and anxiety
Treatment of Withdrawal: N/A
Location/Effect of Drug Action: Inhibitory G protein, GABA, increased serotonin

SUBSTANCE ABUSE DISORDER

Substance: Hallucinogens
Signs and symptoms of intoxication: Ideas of reference, perceptual disturbances, impaired judgment, dissociative symptoms
Treatment of intoxication
- Place in quiet room
- Antipsychotics, benzodiazepines

Symptom of withdrawal: N/A
Treatment of withdrawal: N/A
Location/MOA: Stimulate glutamate and serotonin

SUBSTANCE ABUSE DISORDER

Substance: Inhalants
Signs and symptoms of intoxication:
- Belligerence, apathy, aggression, impaired judgment, stupor or coma
- Nasal crusting, rash, drunken appearance, dilated pupils
- Use can be fatal
- Parkinsonism has been associated with huffing

Treatment of intoxication: Antipsychotics
Symptoms of withdrawal: Nausea, excessive sweating, muscle cramps, headaches, chills, agitation, shaking, and hallucinations
Treatment of withdrawal: Benzodiazepines, antipsychotics
Location/MOA: GABA, cerebellum

SUBSTANCE ABUSE DISORDER

Substance: Opiates
Signs and symptoms of intoxication: Apathy, dysphoria, pinpoint pupils, drowsiness, slurred speech, coma, death
Treatment of intoxication: Naloxone
Signs and symptoms of withdrawal: Fever, chills, runny nose, diarrhea, muscle spasms, cramps
Treatment of withdrawal: Clonidine, methadone, buprenorphine
Location/MOA
- Mu, kappa, and delta receptors
- Nucleus accumbens

SUBSTANCE ABUSE DISORDER

Substance: Barbiturates
Signs and symptoms of intoxication
- Restlessness, agitation, insomnia, N/V, anxiety
- Tremors, seizures, hallucination, increased heart rate
- Respiratory depression

Treatment of intoxication:
Supportive mechanical ventilation if needed
Signs and symptoms of withdrawal:
- Anxiety, depression
- Cognitive impairments
- Memory deficits, lack of attention
- Seizures, delirium

Treatment of withdrawal: Phenobarbital
Location/MOA: GABA

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