Lobby

What percent of US adults (18 years and older) reported having an alcohol use disorder in 2018?

a. 3.6%
b. 5.8%
c. 4.3%
d. 10.2%

Source: NIH 2018 Survey Data

Northwest (HHS Region 10)

PTTC Prevention Technology Transfer Center Network

Funded by Substance Abuse and Mental Health Services Administration

Pharmacology Basics & Alcohol

What Prevention Specialists Need to Know

Ron Jackson, MSW, LICSW
Clinical Professor
School of Social Work, University of Washington

Disclaimer

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SDRG

SCHOOL OF SOCIAL WORK
UNIVERSITY of WASHINGTON

Prevention Science Graduate Program
WASHINGTON STATE UNIVERSITY

CASAT
Center for the Application of Substance Abuse Technologies
University of Nevada, Reno

Pharmacology for Prevention Specialists – A Four-Part Webinar Series

Pharmacology of Opioids

October 15, 2020

Pharmacology of Psychostimulants (cocaine & methamphetamine)

October 22, 2020

Pharmacology of Cannabis

October 29, 2020

All webinars are from 11:00 AM – 12:30 PM Pacific Time

A Guide to HHS Region 10 State Cannabis Policies

Presenter

Ron Jackson, MSW, LICSW, is a Clinical Professor at the University of Washington's School of Social Work where he teaches courses on addiction and its treatment methods. He recently retired as the Executive Director of Evergreen Treatment Services (ETS), a private non-profit organization, in Seattle, Washington, that provides outpatient opioid treatment in clinics in western Washington and street-based case management services for homeless persons with substance misuse disorders (REACH Program) in Seattle. He served for 10 years as a Co-Principal Investigator for the Washington Node of NIDA's Clinical Trials Network and is currently on the Advisory Board for the NWATTC. Mr. Jackson has worked in the field of addiction treatment since 1972.

ADDICTION

“Addiction is a brain disease shaped by behavioral and social context.”

Dr. Alan Leshner, Former Director
National Institute on Drug Abuse

“Drug addiction is associated with altered cortical activity and decision making that appears to overvalue reward, undervalue risk, and fail to learn from repeated errors.”

Dr. Nora Volkow, Director
National Institute on Drug Abuse

“Any disease that is treated as a mystery and acutely enough feared will be felt to be morally, if not literally, contagious.”

Susan Sontag, “Illness as Metaphor” 1978

Stigma – the stain of addiction

Factors influencing stigma:

- Cause – it is/is not their fault
- Controllability – They can/can’t help it
- Safety – They are/aren’t dangerous to me

The first casualty of mental illnesses and addictions is hope.

Stigma has four distinct components:

- labeling someone with a condition
- stereotyping people who have that condition
- creating a division: a superior "us" group and a devalued "them" group, resulting in loss of status in the community
- discriminating against someone on the basis of their label(s)

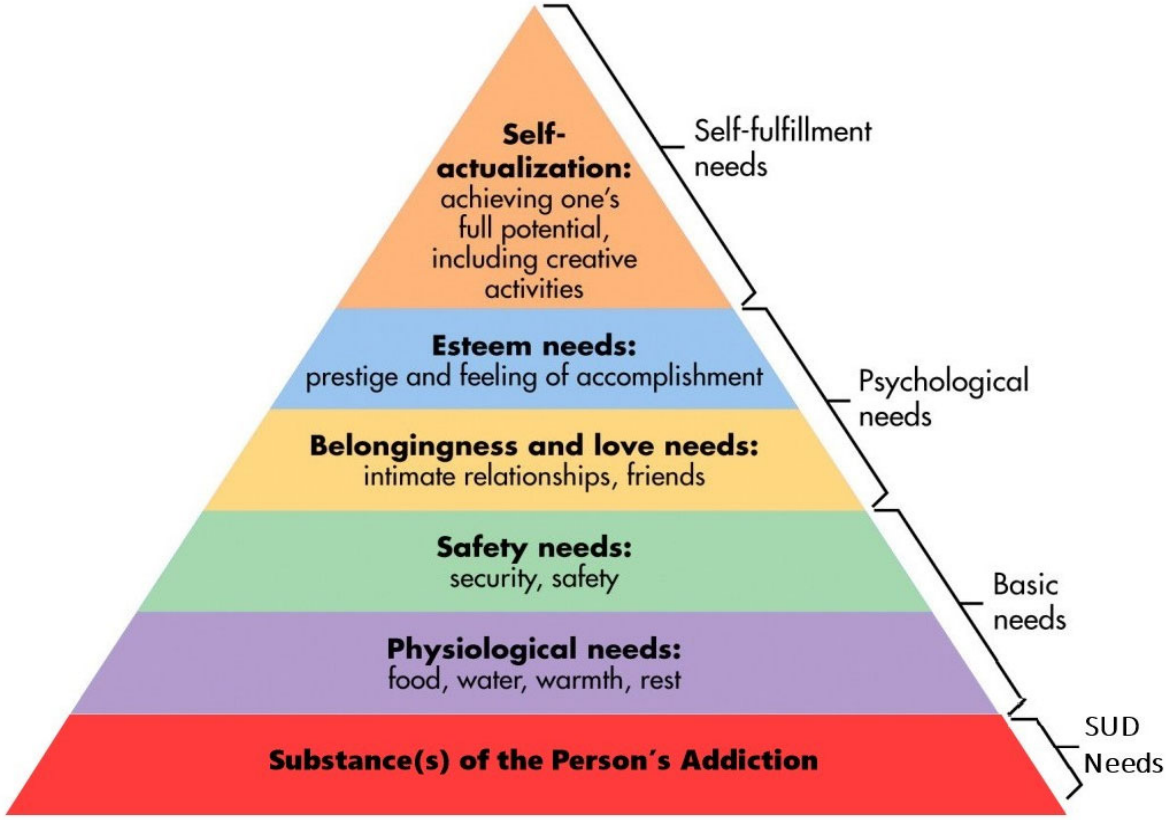
(Central LHIN Resource Manual, 2012)

ELEMENTS OF ADDICTION

1. COMPULSION & CRAVING
   A. BIOLOGICAL (WITHDRAWAL)
   B. CONDITIONED RESPONSE
2. LOSS OF CONTROL OVER USE
3. CONTINUED USE DESPITE ADVERSE CONSEQUENCES
4. SALIENCE OF USE

DURATION of SYMPTOMS

Maslow's Hierarchy of Needs: As changed by addiction



Substance Use Disorders – DSM 5

- **Tolerance***
- **Withdrawal***
- **More use than intended**
- **Craving for the substance**
- **Unsuccessful efforts to cut down**
- **Spends excessive time in acquisition**
- **Activities given up because of use**
- **Uses despite negative effects**
- **Failure to fulfill major role obligations**
- **Recurrent use in hazardous situations**
- **Continued use despite consistent social or interpersonal problems**

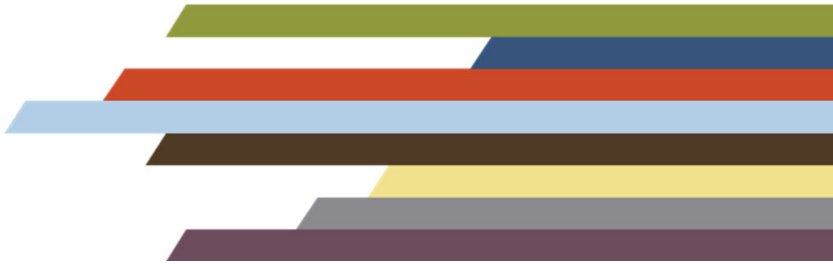
Severity measured by number of symptoms:
2-3 mild
4-6 moderate
7-11 severe

***not counted if prescribed by a physician**

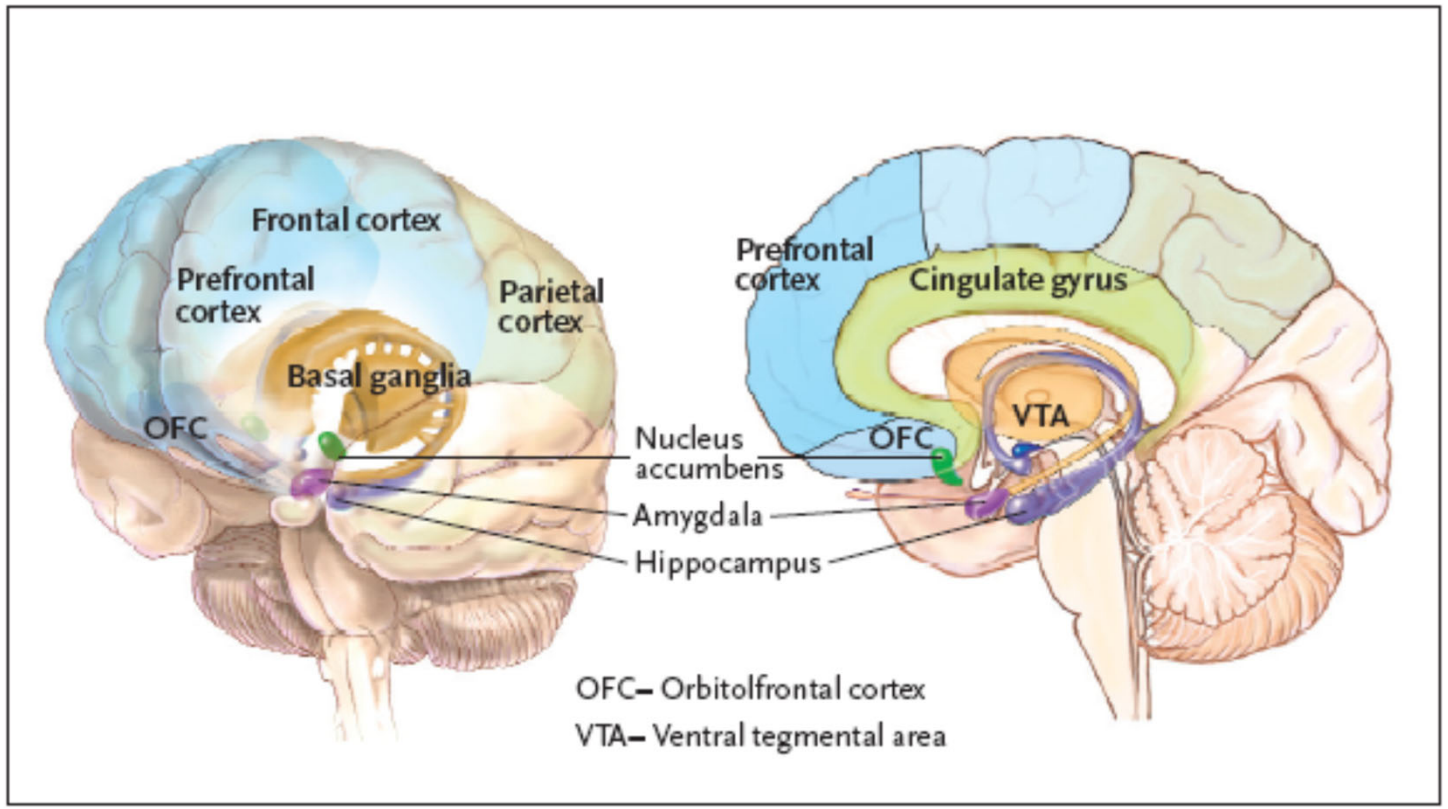
THEORIES ON THE ETIOLOGY OF ADDICTION

- DRUG BASED (AGENT)
- USER BASED (HOST)
  - PSYCHOLOGICAL
  - BIOLOGICAL
- ENVIRONMENT BASED

Basics of Pharmacology



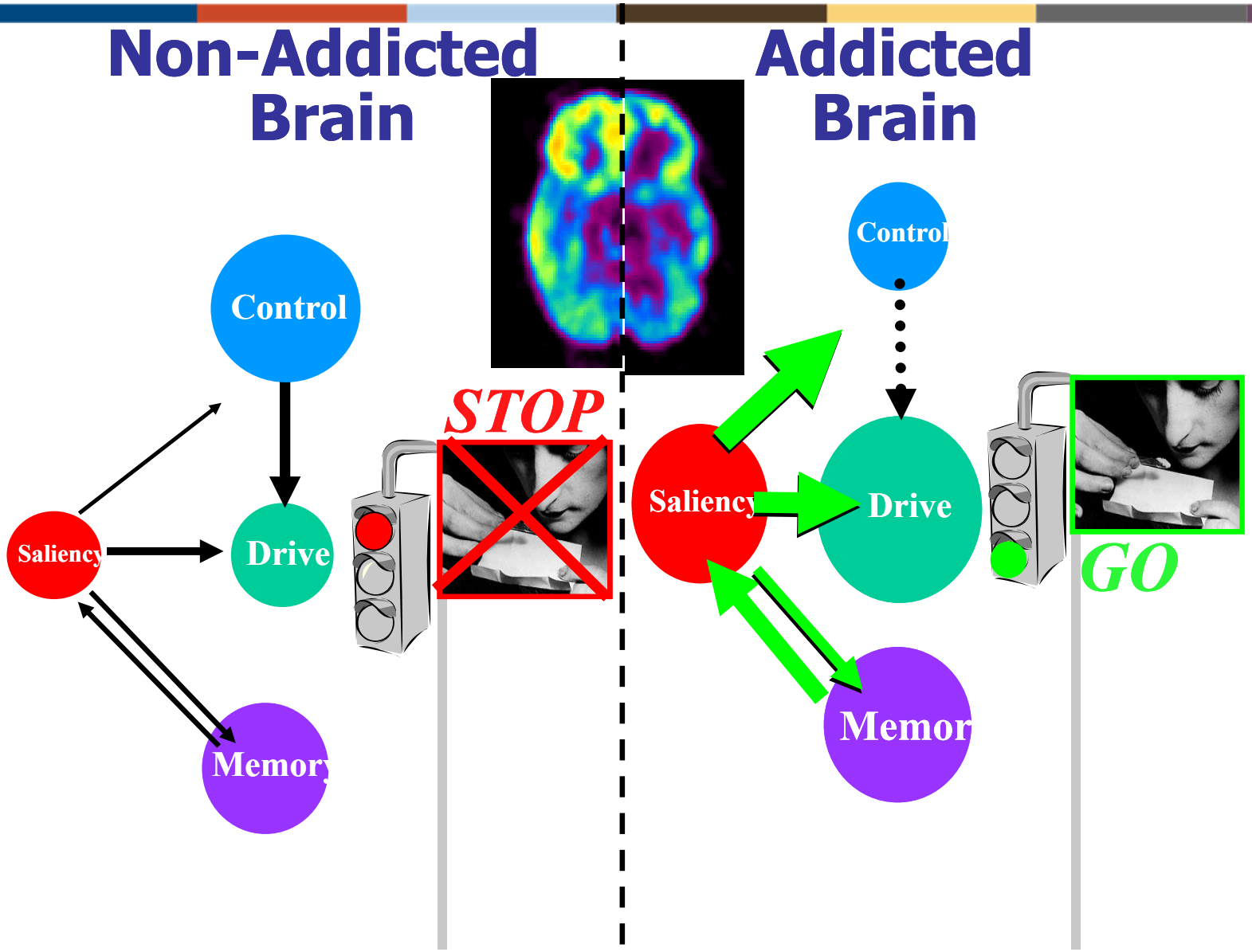
Major Brain Regions with Roles in Addiction



The prefrontal cortex is the focal area for cognition and planning. The ventral tegmental area (VTA) and nucleus accumbens (NAc) are key components of the brain's reward system. The VTA, NAc, amygdala, and hippocampus are major components of the limbic system, which coordinates drives, emotions, and memories.

How Drugs Work

- Interact with neurochemistry
- Results:
  - ✓Feel Good – Euphoria/reward
  - ✓Feel Better – reduce negative feelings
- Final result – behavior persists


Non-Addicted Brain
Addicted Brain
Control
Saliency
Drive
Memory
STOP
Control
Saliency
Drive
Memor
GO

Drug Dependence: A Chronic Medical Illness

- Genetic Heritability – twin studies
  - Hypertension – 25-50%
  - Diabetes – Type 1: 30-55%; Type 2: 80%
  - Asthma – 36-70%
  - Nicotine – 61% (both sexes)
  - Alcohol – 55% (males)
  - Marijuana – 52% (females)
  - Heroin –34% (males)
- Voluntary Choice – shaped by personality and environment
- Pathophysiology – neurochemical adaptations
- Treatment Response
  - Medications – effectiveness and compliance
  - Behavioral interventions

McLellan, A.T., et.al., Drug Dependence, a Chronic Medical Illness *Journal of the American Medical Association* 284:1689-1695, 2000.

VARIABLES DETERMINING DRUG EFFECTS

- DOSE
- ROUTE OF ADMINISTRATION
- SET & SETTING
- OTHER DRUGS IN COMBINATION
- BIOCHEMICAL INDIVIDUALITY

DRUG CLASSIFICATION

- CNS DEPRESSANTS
  - SEDATIVE-HYPNOTICS
    - ETHANOL, BARBITURATES, BENZODIAZEPINES, METHAQUALONE, VOLATILE INHALANTS, GHB
  - OPIATE ANALGESICS
    - MORPHINE, HEROIN, METHADONE, CODEINE, OXYCODONE, DEMEROL
- CNS STIMULANTS
    - COCAINE, AMPHETAMINE / METHAMPHETAMINE, METHYLPHENIDATE, NICOTINE, CAFFEINE
- HALLUCINOGENS
    - LSD, PSYLOCIBIN, MESCALINE, MDA / MDMA, PCP, KETAMINE
- CANNABIS - MARIJUANA & HASHISH

Alcohol

What is considered a standard drink?

a. 5 ounce glass of wine
b. 12 ounce can of beer
c. 1.5 ounce glass of spirits (vodka, whiskey, gin)
d. All of the above
e. None of the above

What Is a Standard Drink?

A standard drink contains about 14 grams (about 0.6 fluid ounces) of pure alcohol. Below are approximate standard drink equivalents.

12 oz. of beer or cooler

12 oz.

8–9 oz. of malt liquor

8.5 oz. shown in a 12-oz. glass that, if full, would hold about 1.5 standard drinks of malt liquor

8.5 oz.

5 oz. of table wine

5 oz.

3–4 oz. of fortified wine

(such as sherry or port)

3.5 oz. shown

3.5 oz.

2–3 oz. of cordial, liqueur, or aperitif

2.5 oz. shown

2.5 oz.

1.5 oz. of brandy

(a single jigger)

1.5 oz.

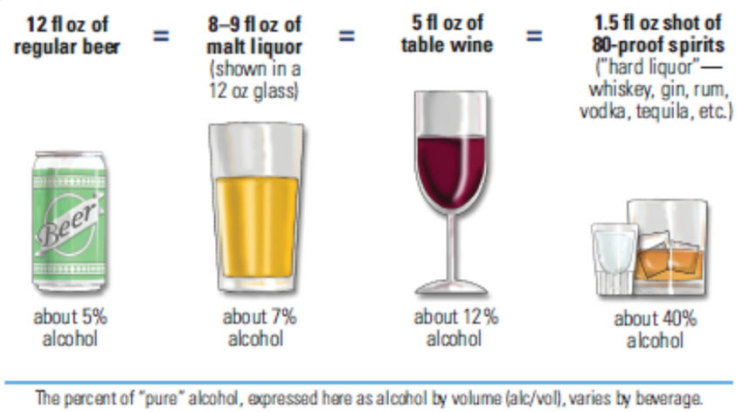
1.5 oz. of spirits

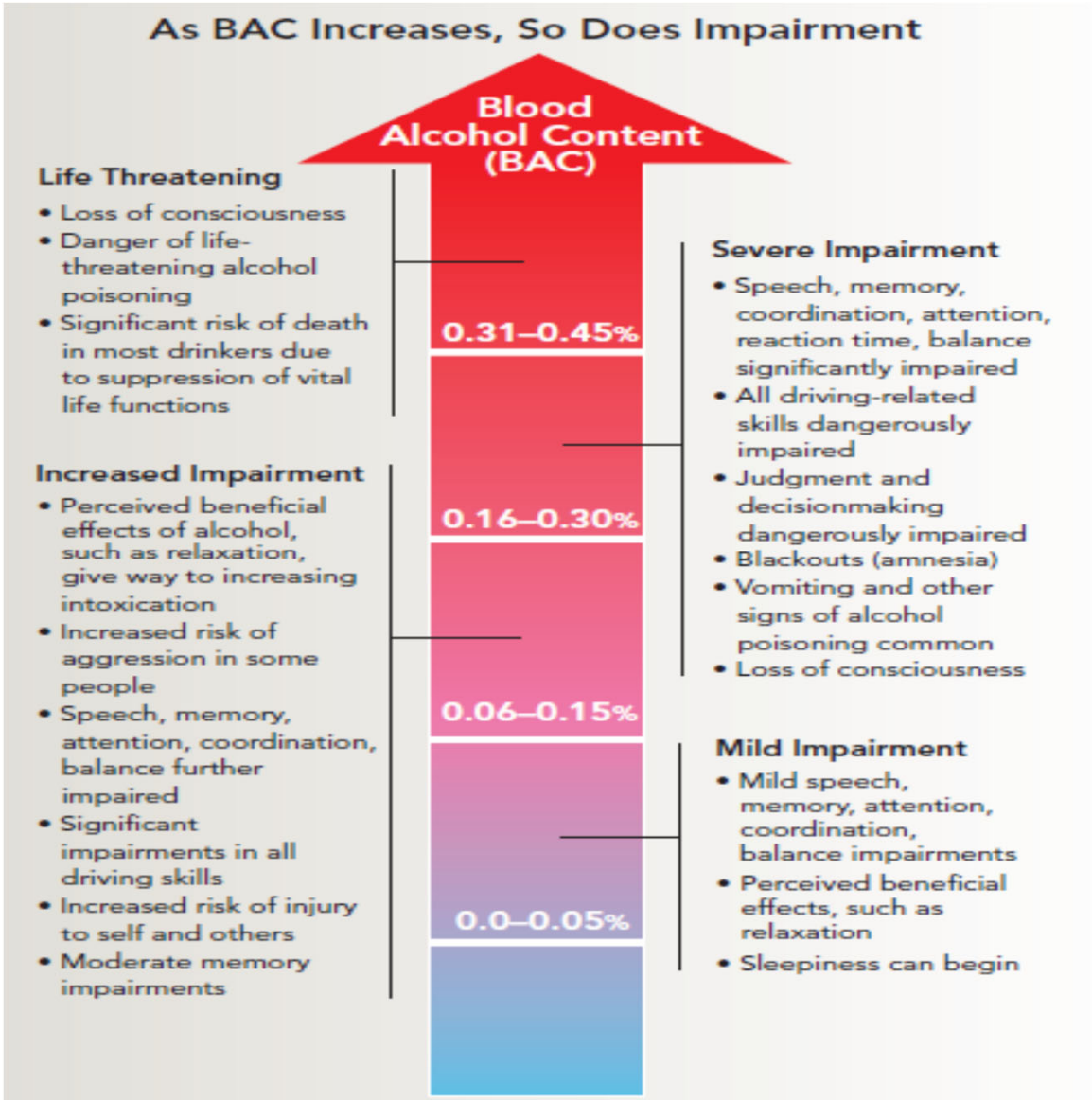
(a single jigger of 80-proof gin, vodka, whiskey, etc.)

Shown straight and in a highball glass with ice to show level before adding mixer

1.5 oz.

Note: People buy many of these drinks in containers that hold multiple standard drinks. For example, malt liquor is often sold in 16-, 22-, or 40-oz. containers that hold between two and five standard drinks, and table wine is typically sold in 25 oz. (750 ml.) bottles that hold five standard drinks.


12 fl oz of regular beer
=
8–9 fl oz of malt liquor (shown in a 12 oz glass)
=
5 fl oz of table wine
=
1.5 fl oz shot of 80-proof spirits ("hard liquor"—whiskey, gin, rum, vodka, tequila, etc.)
Beer
about 5% alcohol
about 7% alcohol
about 12% alcohol
about 40% alcohol
The percent of "pure" alcohol, expressed here as alcohol by volume (alc/vol), varies by beverage.


As BAC Increases, So Does Impairment
Blood Alcohol Content (BAC)
Life Threatening
• Loss of consciousness
• Danger of life-threatening alcohol poisoning
• Significant risk of death in most drinkers due to suppression of vital life functions
Increased Impairment
• Perceived beneficial effects of alcohol, such as relaxation, give way to increasing intoxication
• Increased risk of aggression in some people
• Speech, memory, attention, coordination, balance further impaired
• Significant impairments in all driving skills
• Increased risk of injury to self and others
• Moderate memory impairments
0.31–0.45%
0.16–0.30%
0.06–0.15%
0.0–0.05%
Severe Impairment
• Speech, memory, coordination, attention, reaction time, balance significantly impaired
• All driving-related skills dangerously impaired
• Judgment and decisionmaking dangerously impaired
• Blackouts (amnesia)
• Vomiting and other signs of alcohol poisoning common
• Loss of consciousness
Mild Impairment
• Mild speech, memory, attention, coordination, balance impairments
• Perceived beneficial effects, such as relaxation
• Sleepiness can begin

ALCOHOL

ACUTE USE SYMPTOMS

- Sedation — drowsiness to comatose — function of B.A.L.
- Relief of anxiety
- Disinhibition & impaired risk assessment ability
- Impairment of motor coordination
- Blackout (very rapid consumption)
- Increased aggression

ALCOHOL

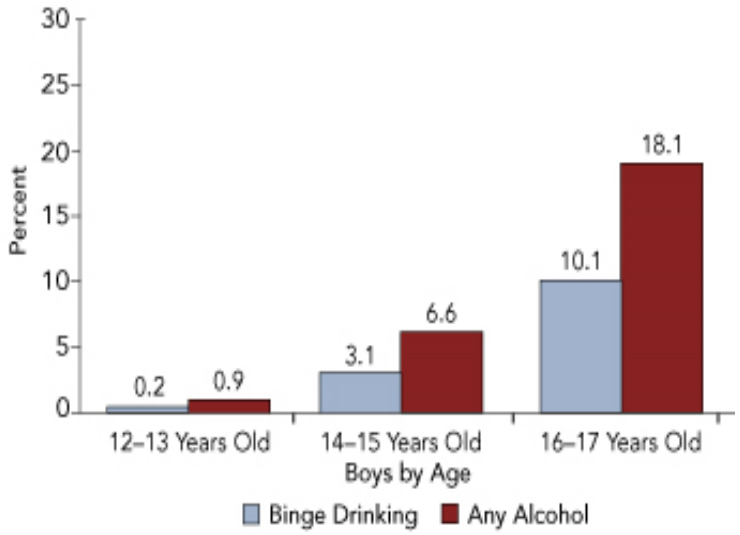
Binge Drinking

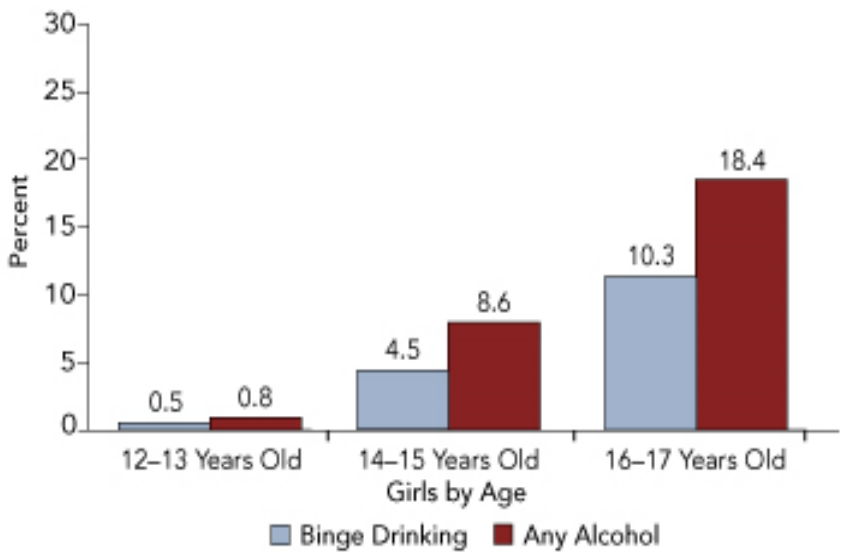
- For adults:
  - Men – 5 or more drinks within two hours
  - Women – 4 or more drinks within two hours
- For adolescents:
  - Boys:
    - Ages 9–13: About 3 drinks
    - Ages 14–15: About 4 drinks
    - Ages 16–17: About 5 drinks
  - Girls;
    - Ages 9–17: About 3 drinks

Source: https://www.niaaa.nih.gov/publications/brochures-and-fact-sheets/underage-drinking

ALCOHOL

Adolescent Drinking





Source: https://www.niaaa.nih.gov/publications/brochures-and-fact-sheets/underage-drinking

Alcohol Use by People 65+

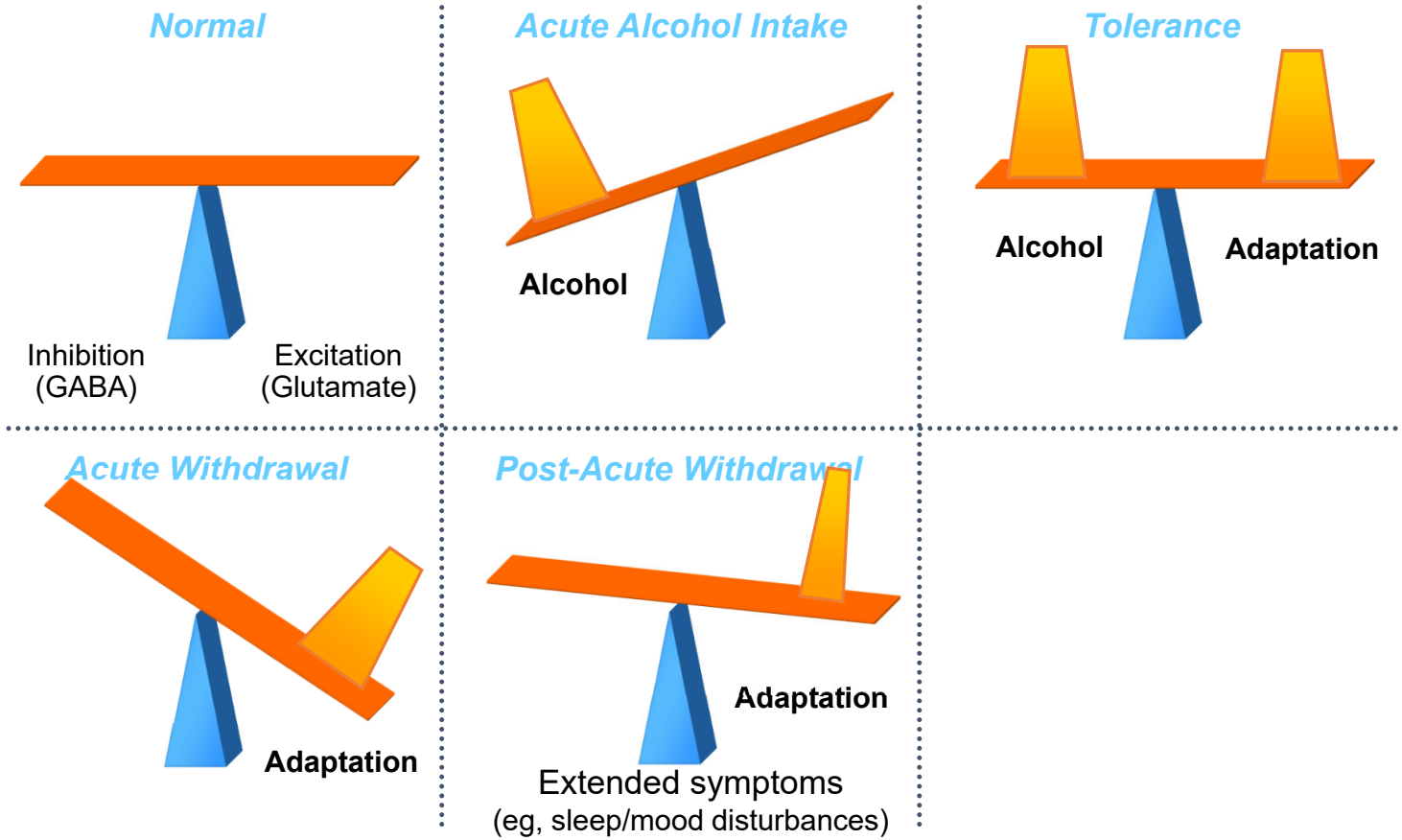
- Because of a decrease in body water, it takes less alcohol consumption to make drinking risky or harmful to the 65+ drinker.
  - Healthy adults 65+ should limit drinking to no more than 3 drinks on a given day and no more than 7 drinks in a week (NIAAA).
- **Increased health problems** – certain health problems are common in older adults. Heavy drinking can make these problems worse, including:
  - *Diabetes*
  - *High blood pressure*
  - *Congestive heart failure*
  - *Liver problems*
  - *Osteoporosis*
  - *Memory problems*
  - *Mood disorders*

ALCOHOL

CHRONIC USE SYMPTOMS

- Liver and brain damage
- Cardiac problems and hypertension
- Neurological damage
- Increased risks for cancers
- Impotence in males
- Malnutrition
- Memory problems
- Mood swings
- Pancreatitis
- Ulcers and other gastric problems
- Fetal abnormalities/birth defects — Fetal Alcohol Spectrum Disorder

Features of Alcohol Dependence



Source: De Witte. *Addict Behav*. 2004;29(7):1325-1339.

Chat

What are some common alcohol withdrawal symptoms?

ALCOHOL

WITHDRAWAL SYMPTOMS

- ANXIETY
- TREMORS
- HEART RHYTHM IRREGULARITIES
- HALLUCINATIONS — VISUAL, AUDITORY AND TACTILE
- CONVULSIONS
- COMA
- DEATH

Symptoms of Alcohol Withdrawal Syndrome

Symptoms	*Time of appearance after cessation of alcohol use*
• Minor withdrawal symptoms: insomnia, tremulousness, mild anxiety, gastrointestinal upset, headache, diaphoresis, palpitations, anorexia	• 6 to 12 hours
• Alcoholic hallucinosis: visual, auditory, or tactile hallucinations	• 12 to 24 hours
• Withdrawal seizures: generalized tonic-clonic seizures	• 24 to 48 hours
• Alcohol withdrawal delirium (delirium tremens): hallucinations (predominately visual), disorientation, tachycardia, hypertension, low-grade fever, agitation, diaphoresis	• 48 to 72 hours

Alcohol Withdrawal Syndrome
Protracted Symptoms

- Anxiety
- Hostility and irritability
- Depression and anhedonia
- Fatigue and insomnia
- Difficulties concentrating and thinking
- Reduced sexual interest
- Unexplained physical complaints, especially of pain

Alcohol & Pregnancy

- No safe amount of alcohol during pregnancy
- Harmful effects to fetus are more related to greater amounts of alcohol consumption; especially earlier in pregnancy (before the last trimester)
- Fetal Alcohol Spectrum Disorder (FASD)
  - Range of effects

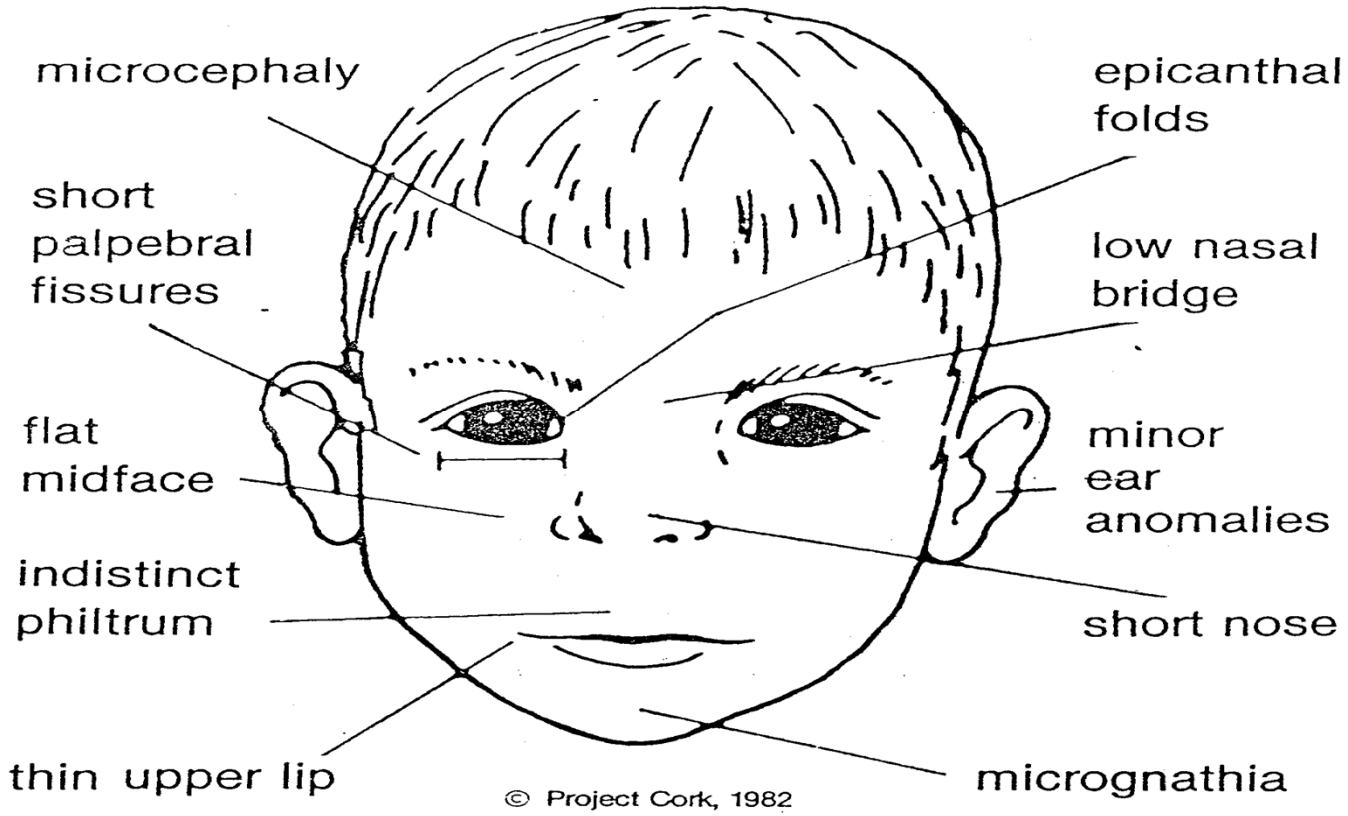
FASD Categories

- Alcohol-Related Neurodevelopmental Disorders (ARND): DSM-5 SUD Section III
  - Sleep disruptions; delays in learning and motor skill development; increase rates of ADHD, oppositional defiance disorder & conduct disorder
- Alcohol-Related Birth Defects Disorders (ARBD)
  - Heart murmurs, joint abnormalities; ↑ risk for SIDS
- Fetal Alcohol Syndrome (FAS) diagnostic standards:
  - Growth abnormalities (small size at birth and later)
  - Facial abnormalities
  - Neurodevelopmental abnormalities, e.g., intellectual disability (ID) which is characterized by below-average intelligence or mental ability and a lack of skills necessary for day-to-day living.

Fetal Alcohol Syndrome

Facial Characteristics

https://nccd.cdc.gov/FASD/



http://depts.washington.edu/fasdwa/

Medications in alcoholism treatment

- Disulfiram (Antabuse®)
- Acamprosate (Campral®)
  - ✓Probably increases the activity of gamma-aminobutyric acid (GABA); inhibits the activity of and receptor sensitivity for the stimulating amino acids such as glutamate
  - ✓Appears to moderate the discomforts from protracted withdrawal symptoms or cue-induced craving
  - ✓Thought to be particularly effective in the early phases of treatment when craving is often most prominent
- Naltrexone (ReVia®, Vivitrol®)
  - ✓opioid "blocker"
    - ➢Vivitrol®, an injectable, long lasting form of naltrexone, is approved for the treatment of alcohol and opioid use disorders

References

- McLellan, A.T., et.al., Drug Dependence, a Chronic Medical Illness *Journal of the American Medical Association* 284:1689-1695, 2000.
- Lewis, M., Brain Change in Addiction as Learning, Not Disease *New England Journal of Medicine* 379: 1551-60, 2018
- National Institute on Drug Abuse (NIDA): https://www.drugabuse.gov/
- National Institute on Alcohol Abuse and Alcoholism: https://www.niaaa.nih.gov/

Last Thing!

Please fill out a feedback form!

Link in chat

Contact Information

Janet Porter, MPH, CPS
Training and TA Coordinator
Email: jporter@casat.org

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Thank You!

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