



UNIVERSITY of MARYLAND  
SCHOOL OF MEDICINE

# ALCOHOL & PREGNANCY



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Division of Addiction  
Research & Treatment  
Department of Psychiatry

**MACS**   
Maryland Addiction Consultation Service  
for MOMs



# DISCLOSURE

- I have no financial relationship with any companies related to this talk.



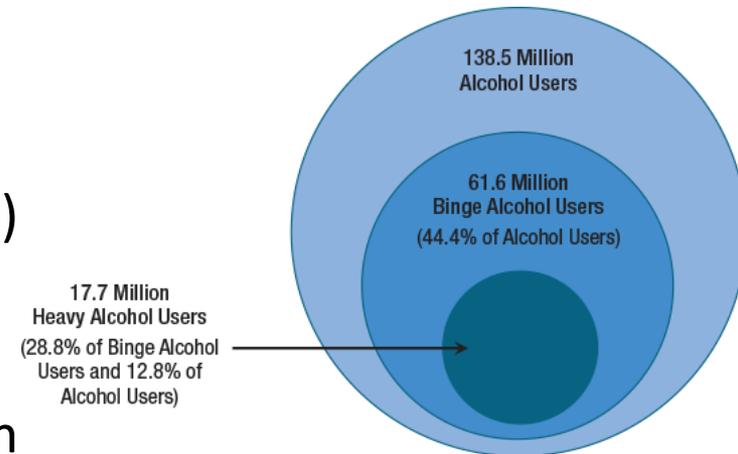
# LEARNING OBJECTIVES

- Participants will be able to better understand the epidemiology of alcohol use during pregnancy.
- Participants will be able to discuss best practices in management of alcohol withdrawal during pregnancy.
- Participants will be able to name 5 signs of Fetal Alcohol Spectrum Disorders.



# PREVALENCE OF ALCOHOL USE & USE DISORDER (U.S.)

- 18+ years old
  - >85% have had alcohol
  - >25% have “binged” in the past month
  - @17 million w AUD (6.2% of age group)
- 12-17 years old
  - > 40% have had alcohol
  - @13% have “binged” in the past month
  - 625,000 w AUD (2.5% of age group)
- 10% of children live w a parent w alcohol problem
- > 88,000 alcohol-related deaths/year
  - 3rd leading preventable cause
  - @ 10,000 impaired driving fatalities
  - >2,200 “poisoning”

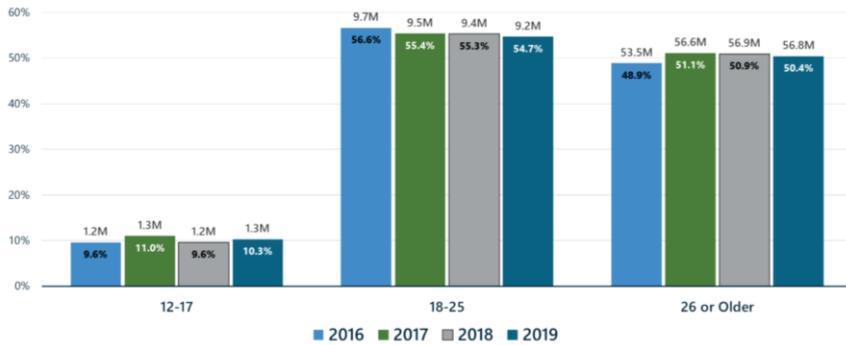




# PREVALENCE OF ALCOHOL USE & USE DISORDER IN WOMEN (NSDUH)

## Alcohol Use among Women

PAST MONTH, 2016-2019 NSDUH, Women 12+

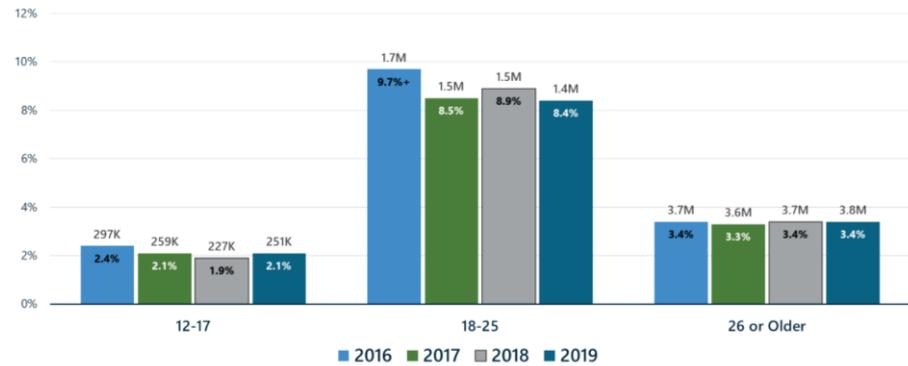


No differences between prior year estimates and the 2019 estimates are statistically significant at the .05 level.



## Alcohol Use Disorder among Women

PAST YEAR, 2016-2019 NSDUH, Women 12+

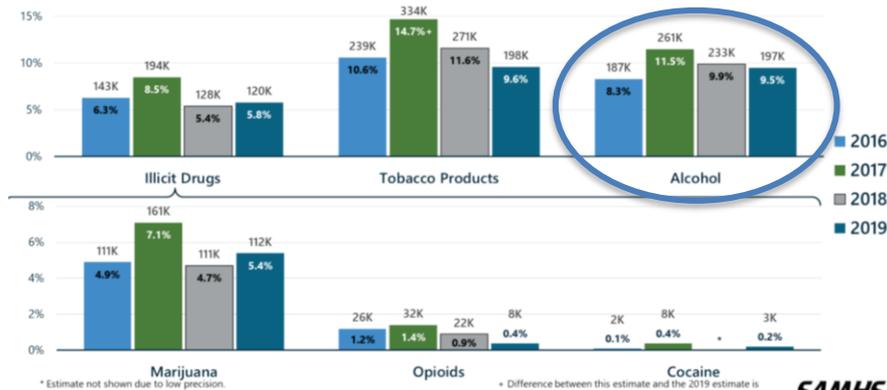


+ Difference between this estimate and the 2019 estimate is statistically significant at the .05 level.



## Past Month Substance Use among Pregnant Women

PAST MONTH, 2016-2019 NSDUH, Women 15-44



\* Estimate not shown due to low precision. Tobacco products are defined as cigarettes, smokeless tobacco, cigars, and pipe tobacco.

+ Difference between this estimate and the 2019 estimate is statistically significant at the .05 level.



**NEWS**

## Moms with young kids increased drinking by 323% after start of pandemic: study

By Patrick Reilly August 15, 2021 | 4:53pm | Updated



### THE CONVERSATION

Academic rigor, journalistic fact

COVID-19 Arts • Culture Economy • Business Education Environment • Energy Ethics • Religion Health Politics • Society Science • Technology



**Women are drinking more during the pandemic, and it's probably got a lot to do with their mental health**

Published: June 2, 2020 2:28am EDT

**Don't Give Up**

**Sublocodone**  
A prescription-addiction medicine for substance use disorder

LEARN MORE

What is the most important information I should know about SUBLOCODONE? SUBLOCODONE is a prescription medicine used to treat adults with moderate to severe addiction (dependence) to opioid drugs (prescription or illegal) who have received an oral prescription opioid under the brand name ZEPHIRUS. SUBLOCODONE is not available in other pharmacies. A black box warning is present with the drug to warn of a risk of death if you take SUBLOCODONE with other medicines, including SERENIT, WELLBUTRIN, and MAO inhibitors. SUBLOCODONE is not available in other pharmacies. A black box warning is present with the drug to warn of a risk of death if you take SUBLOCODONE with other medicines, including SERENIT, WELLBUTRIN, and MAO inhibitors.

Mental Health > Substance Abuse and Addiction > News

[WEBMD HEALTH NEWS]

# Drinking Jumps During Pandemic, Especially in Young Women

By Betsy Swift, Ypsaug, MA



Nov. 23, 2021 -- Beth L (not her real name), a children's

npr ALL YOUR FAVORITE MUSIC

SIGN IN NPR SHOP DONATE

NEWS CULTURE MUSIC PODCASTS & SHOWS SEARCH

**Shots** HEALTH NEWS FROM NPR

YOUR HEALTH

## < Women Now Drink As Much As Men — Not So Much For Pleasure, But To Cope

June 9, 2021 - 5:18 AM ET

3-Minute Listen + PLAYLIST

Transcript

AILSIA CHANG, HOST:

Search analysis, research, academics...

MARCH 19, 2021

## Alcoholic liver disease cases have spiked during the pandemic, especially among young women

Admissions for the illness have jumped by as much as 50% at some hospitals since last March

BY ALLIE MILLER  
PhillyVoice Staff



CONGEBDESIGN/PIKABAY

Stress caused by the COVID-19 pandemic has increased alcohol consumption, leading to reports of increased alcoholic liver diseases cases.



# PREVALENCE OF ALCOHOL USE & USE DISORDER (AUD) IN PREGNANCY

- @9.8% of women worldwide use alcohol during pregnancy
  - Extremely variable
    - Australia- 47% prior to learning they are pregnant; @20% continue after learning
    - U.S.- 18% drink during first trimester
- AUD in pregnant women @ 1/3 of non-pregnant women
- Effect 0.6% of pregnancies

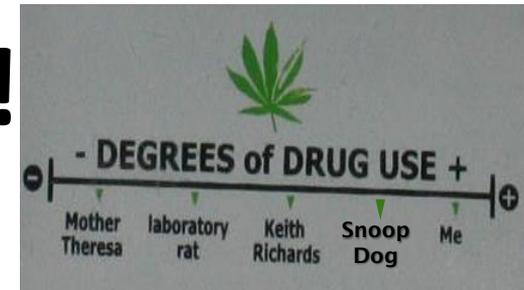


“Pregnancy is a time  
of great potential for  
positive change.”



# SUD SCREENING

- **NEEDS TO BE UNIVERSAL!!**
- **4P's Plus/Integrated 5 P's**
  - **Parents, Peers, Partner, Past, Present**
- **Substance Use Risk Profile-Pregnancy (SURP-P)**
- **CRAFFT (adolescents)**
  - **Car, Relax, Alone, Forget, Family, Trouble**
- **NIDA ASSIST**
- **Alcohol: T-ACE; AUDIT; TWEAK**





# PRIMARY SCREEN: ALCOHOL

- “How often did you have a drink containing alcohol, even beer or wine, in the past year?”

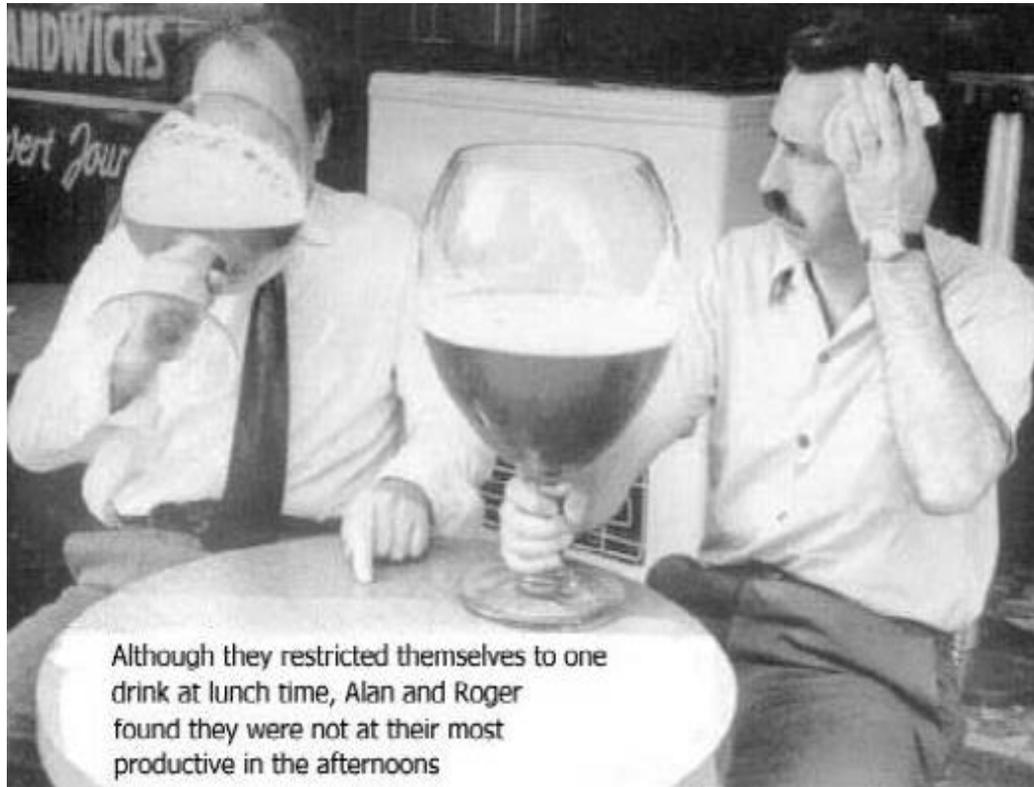
*If any at all, ask:*

- “How many drinks containing alcohol do you have on a typical day when you do drink? **OR**
- “How often did you have 5 (for men)/4 (for women & elderly) or more drinks on one occasion in the past year?”





# WHAT IS A “STANDARD DRINK”?



Although they restricted themselves to one drink at lunch time, Alan and Roger found they were not at their most productive in the afternoons



<p><b>A "STANDARD DRINK"</b> (a standard drink contains approximately 12-14 grams or 0.5-0.6 oz of pure alcohol)</p>					
<p><b>Beer</b> (3-5%) <i>(Budweiser, Miller, Coors, Michelob, Heineken, Corona)</i></p>	<p><b>Malt Liqueur</b> (7-10%) <i>(Steele Reserve, Colt 45, King Cobra, Camo 40, Black Bull, Hurricane, Mickey's, Private Stock)</i></p>	<p><b>Table Wine</b> (12-13%) <i>(Chardonnay, Merlot, Pinot Grigio, Reisling, Sangria)</i></p>	<p><b>Fortified Wine (FW), Port, Sherry</b> (17-20%) <i>(Mad Dog 20/20, Night Train Express, Richard's Wild Irish Rose, Thunderbird)</i></p>	<p><b>Brandy</b> (37-40%) <i>(Cognac, Martell, Hennessy, E &amp; J, Courvoisier, Remy Martin)</i></p>	<p><b>Liquor/Distilled "Spirits"</b> (40%) <i>(vodka, gin, rum, scotch, whiskey, bourbon, tequila)</i></p>
					
<b>12oz.</b>	<b>6-8oz.</b>	<b>5oz.</b>	<b>3.5 oz.</b>	<b>1.5 oz.</b>	<b>1.5 oz.</b>
<p>"Double Deuce" = 2 drinks "Quart" = 2 ½ drinks "40" of beer = 3-4 drinks "40" of malt liquor = 6-7 drinks</p>		<p>"Pint" = 2 ½ drinks "Pint" of FW = 4 drinks "Fifth" = 5 drinks "Fifth" of FW = 7 ½ drinks</p>		<p>"Half Pint" = 4 ½ drinks "Pint" = 8 ½ drinks "Fifth" = 17 drinks "Handle" = 40 drinks</p>	



# NOT EVERYONE DRINKS IN "STANDARD" WAYS



## Intoxication of a Prison Inmate with an Ethyl Alcohol-Based Hand Sanitizer

Christopher Welsh M.D.

Suzanne Dayen M.D.

To the Editor: The Maryland Poison Center was called about a 49-year-old, usually calm prison inmate who was described as being "red-eyed," "loopy," "combative," and "intoxicated, lecturing everyone about life." Other inmates and staff reported seeing this prisoner drinking from a gallon container of Puril hand sanitizer over the course of the evening. It was discovered that this sanitizer contains 62% ethanol by weight (more than 70% alcohol by volume). The inmate's blood alcohol level was found to be 335 mg per dL.



A. S. MAHDI and A. J. McBRIDE

## INTRAVENOUS INJECTION OF ALCOHOL BY DRUG INJECTORS: REPORT OF THREE CASES

AMEERA S. MAHDI and ANDREW J. McBRIDE\*

Community Addiction Unit, 44-46 Cowbridge Road East, Canton, Cardiff CF11 9DU, UK



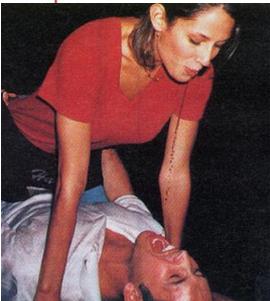
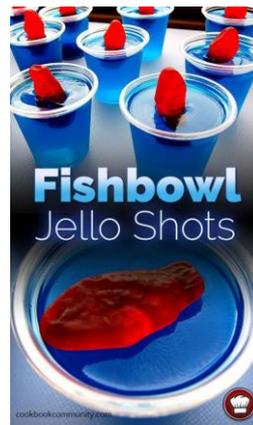
## Tampons: A new, dangerous way for teenage girls to drink

By Maria Castro

Milagros Rios, a 35-year-old waitress and single mother of two in New York City, thought she'd seen it all. But when she walked into her bathroom about a year ago to find her 18-year-old daughter Nicole laying down on the floor and sleeping with a bottle of vodka and a box of tampons in her hand, it was a sight she'd never envisioned.

## Everything You Need to Know About Alcohol Enemas (aka Butt-Chugging)

Process | What happens | How it feels | Why people do it | Risks |  
Safety tips | Takeaway





# YOUTH SCREENING

For ALL Patients...	For Patients Who <b>DO NOT</b> Drink...																																					
STEP 1: Ask the Two Screening Questions	STEP 2: Guide Patient																																					
<p>For elementary and middle school patients, start with the friends' question. Choose the questions that align with the patient's school level, as opposed to age, for patients ages 11 or 14. Exclude alcohol use for religious purposes.</p>																																						
STEP 2: Assess Risk																																						
<p>On how many DAYS in the past year did your patient drink?</p> <table border="1"> <thead> <tr> <th>Age</th> <th>1-5 days</th> <th>6-11 days</th> <th>12-23 days</th> <th>24-51 days</th> <th>52+ days</th> </tr> </thead> <tbody> <tr> <td>≤11</td> <td colspan="5" style="background-color: #c00000; color: white; text-align: center;">Highest risk</td> </tr> <tr> <td>12-15</td> <td colspan="5" style="background-color: #e00000; color: white; text-align: center;">Tx: Brief motivational interviewing + possible referral</td> </tr> <tr> <td>16</td> <td colspan="2" style="background-color: #e00000; color: white; text-align: center;">Lower risk</td> <td colspan="3" style="background-color: #c00000; color: white; text-align: center;">Moderate risk</td> </tr> <tr> <td>17</td> <td colspan="2" style="background-color: #008000; color: white; text-align: center;">Tx: Brief advice</td> <td colspan="3" style="background-color: #e00000; color: white; text-align: center;">Tx: Brief advice or motivational interviewing</td> </tr> <tr> <td>18</td> <td colspan="5" style="background-color: #008000; color: white; text-align: center;">Estimated risk levels by age and frequency in the past year</td> </tr> </tbody> </table>			Age	1-5 days	6-11 days	12-23 days	24-51 days	52+ days	≤11	Highest risk					12-15	Tx: Brief motivational interviewing + possible referral					16	Lower risk		Moderate risk			17	Tx: Brief advice		Tx: Brief advice or motivational interviewing			18	Estimated risk levels by age and frequency in the past year				
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<p><b>Factor in friends:</b></p> <ul style="list-style-type: none"> <li>For elementary and middle school students: Having friends who drink heightens concern.</li> <li>For high school students: Having friends who binge drink heightens concern. Recent research estimates that binge drinking levels for youth start at 3 to 5 drinks, depending on age and gender (see "What Counts as a Drink? A Binge?" on reverse).</li> </ul>																																						
<p><b>Include what you already know</b> about the patient's physical and psychosocial development in your risk evaluation, along with other relevant factors such as the level of family support, drinking and smoking habits of parents and siblings, school functioning, or trouble with authority figures.</p>																																						
<p><b>For moderate and highest risk patients:</b></p> <ul style="list-style-type: none"> <li>Ask about the drinking pattern: "How much do you usually have? What's the most you've had at any one time?" If patient reports bingeing, ask: "How often do you drink that much?"</li> <li>Ask about problems experienced or risks taken: Examples include getting lower grades or missing classes; drinking and driving or riding in a car driven by someone who has been drinking; having unplanned, unsafe sex; getting into fights; getting injured; having memory blackouts; and passing out.</li> <li>Ask whether the patient has used anything else to get high in the past year, and consider using other formal tools to help gauge risk.</li> </ul>																																						
ASSESSMENT COMPLETE for patients who do not drink.																																						

### Elementary School (ages 9-11)

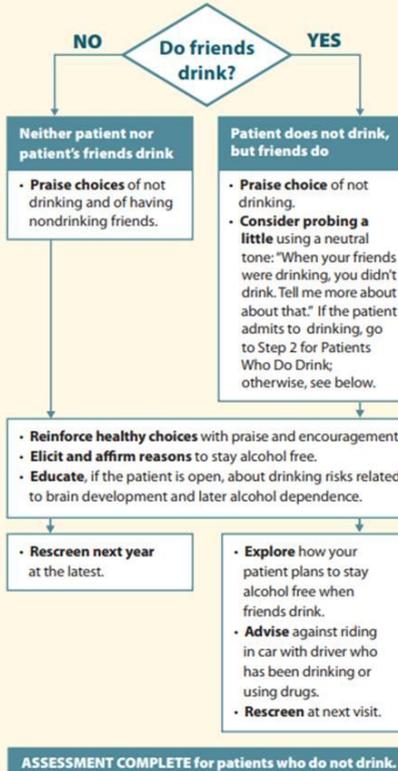
<p><b>Friends: Any drinking?</b> "Do you have any friends who drank beer, wine, or any drink containing alcohol in the <b>past year</b>?" <b>ANY drinking by friends heightens concern.</b></p>	<p><b>Patient: Any drinking?</b> "How about you—have you <b>ever</b> had more than a few sips of any drink containing alcohol?" <b>ANY drinking: Highest Risk</b></p>
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### Middle School (ages 11-14)

<p><b>Friends: Any drinking?</b> "Do you have any friends who drank beer, wine, or any drink containing alcohol in the <b>past year</b>?" <b>ANY drinking by friends heightens concern.</b></p>	<p><b>Patient: How many days?</b> "How about you—in the <b>past year, on how many days</b> have you had more than a few sips of any drink containing alcohol?" <b>ANY drinking: Moderate or Highest Risk (depending on age and frequency)</b></p>
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### High School (ages 14-18)

<p><b>Patient: How many days?</b> "In the <b>past year, on how many days</b> have you had more than a few sips of beer, wine, or any drink containing alcohol?" <b>Lower, Moderate, or Highest Risk (depending on age and frequency)</b></p>	<p><b>Friends: How much?</b> "If your friends drink, <b>how many drinks</b> do they usually drink on an occasion?" <b>Binge drinking by friends heightens concern. (See "What Counts as a Drink? A Binge?" on reverse)</b></p>
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# LEVELS OF RISK: ALCOHOL

	Drinks/Week	Drinks/Occasion
<b>Men</b>	More than <b>14</b>	More than <b>4</b>
<b>Women</b>	More than <b>7</b>	More than <b>3</b>
<b>65+</b>	More than <b>7</b>	More than <b>3</b>

- Patients drinking above these recommended levels could be putting themselves at risk for illness or injury. Their alcohol use should be addressed with a secondary screen and/or a brief intervention/advice.
- Patients with high physical dependence may need medication to manage withdrawal.



# T-ACE/T-ACER-3

- How many drinks does it take to make you feel high? ( **TOLERANCE** )
- Have people **ANNOYED** you by criticizing your drinking?
- Have you ever felt you ought to **CUT DOWN** on your drinking?
- Have you ever had a drink first thing in the morning to steady your nerves or get rid of a hangover? ( **EYE-OPENER** )

+ if 2 of ACE or 2 drinks for T/+ if 3 of ACE  
69% sensitivity; 89% specificity



# TWEAK

- **TOLERANCE**: “How many drinks can you hold?”
- “Have close friends or relatives **WORRIED** or complained about your drinking in the past year?”
- **EYE-OPENER**: “Do you sometimes take a drink in the morning when you first get up?”
- **AMNESIA**: “Has a friend or family member ever told you about things you said or did while you were drinking that you could not remember?”
- “Do you sometimes feel the need to **C(K)UT DOWN** on your drinking?”

Sensitivity: 59% - 87%    Specificity: 72% - 94%



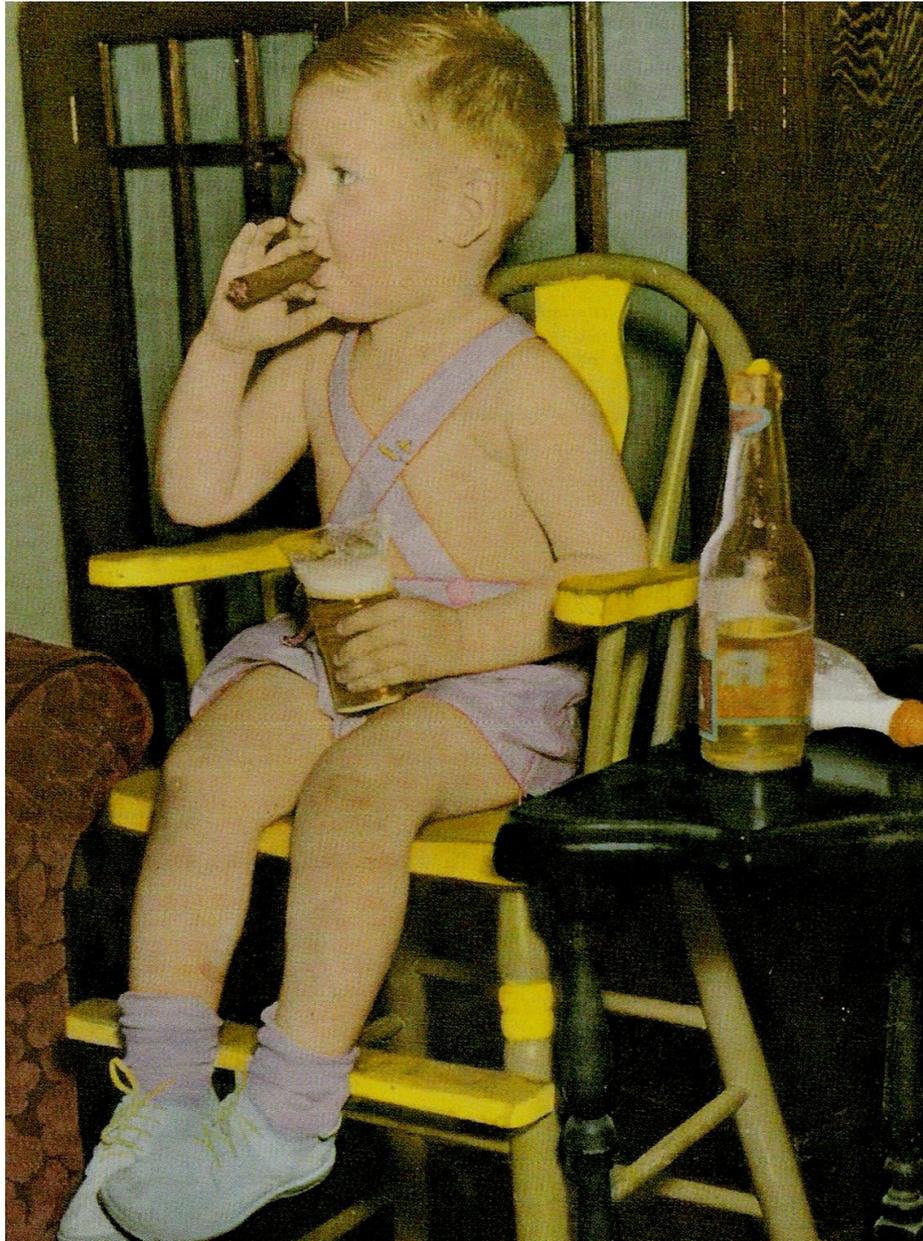
# SURP-P

- 1. Have you ever smoked marijuana?
  - 2. In the month before you knew you were pregnant, how many beers, how much wine, or how much liquor did you drink?\*
  - 3. Have you ever felt the need to cut down on your drug or alcohol use?
- 
- 0 affirmative responses-low-risk,
  - 1 affirmative response- moderate risk
  - 2-3 affirmative responses-high-risk



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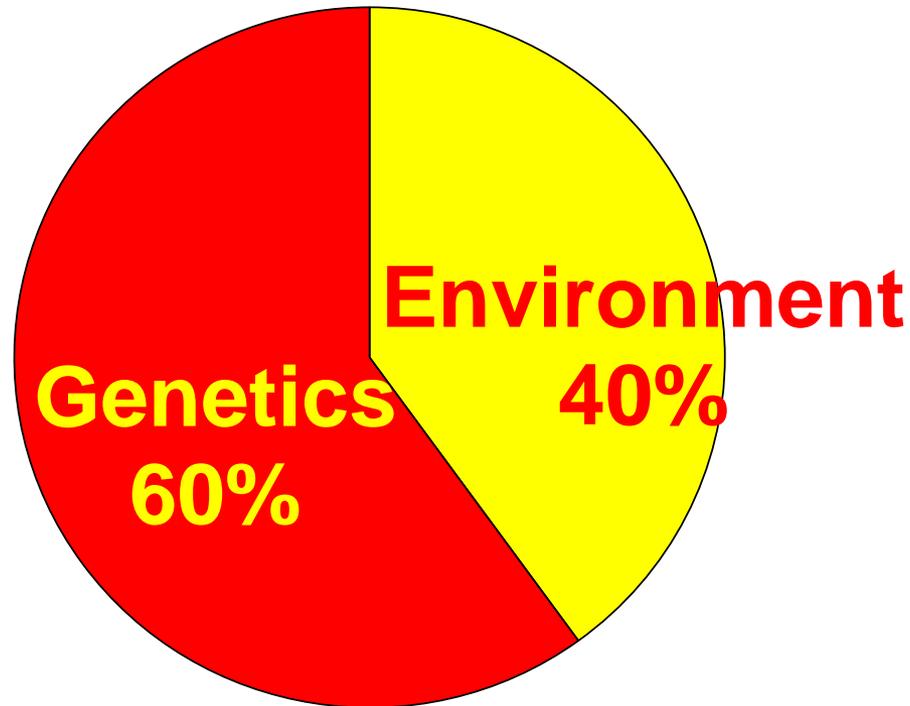
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# NATURE vs NURTURE





# GENETIC FACTORS ASSOCIATED w ALCOHOL USE DISORDER

- 3 to 4 times higher risk in close relatives of people with AUD. Higher risk associated with:
  - Greater number of affected relatives
  - Closer genetic relationships
  - Severity of alcohol-related problems in affected relative(s)
- Significantly higher risk in monozygotic twin than dizygotic twin of a person with alcohol dependence
- 3- to 4-fold increase in risk in adopted children with a natural parent who is alcohol dependent despite being raised by adoptive parents without the disorder



# GENETICS OF EtOH RESPONSE

<i>Phenotype</i>	<i>Genes</i>
Facial flushing after drinking	ALDH2 ADH1B, ADH1C
Impulsivity and disinhibition	GABRA2 ADH4 CHRM2 DRD2, DRD4
Low level of response to ethanol	GABRA1, GABRA6

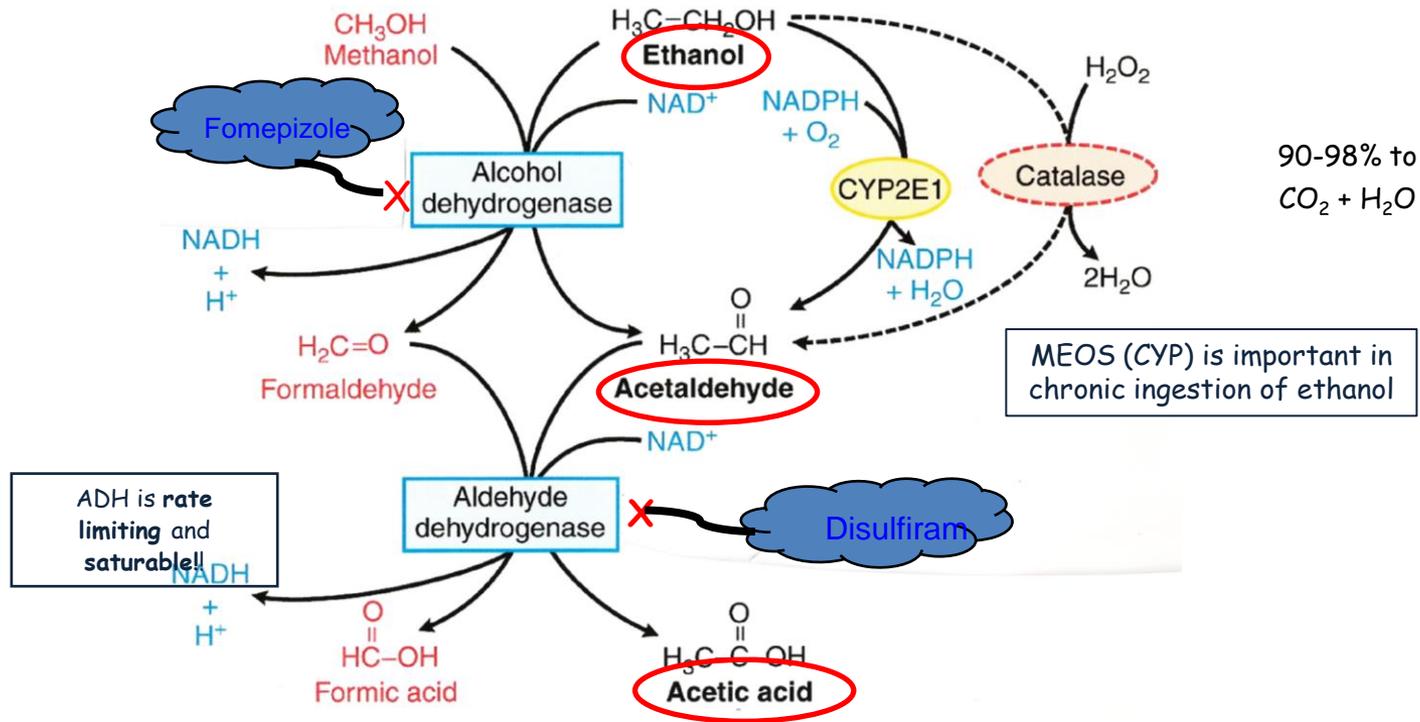


# DISTRIBUTION

- High water solubility
- Totally miscible with all body fluids
  - follows water content of tissue
- Accumulates in High blood-flow organs (brain)
- Blood/alveolar air partition coefficient (p.c.) for EtOH is 2100:1 (allows for breathalyzer)
- Enters fetal circulation (FAS)



# METABOLISM OF ETHANOL



EtOH metabolism is mainly hepatic



# GENDER & EtOH METABOLISM

- BAC\* is generally based on body weight, gender, and amount consumed

- Male-female differences
  - Gastric ADH: F < M
  - Volume of Distribution(VD):
    - 55%(F) vs. 68%(M) of body weight

\*BAC, blood alcohol concentration

BLOOD ALCOHOL CONTENT									
Body Weight									
Drinks	90 lb	100 lb	120 lb	140 lb	160 lb	180 lb	200 lb	220 lb	240 lb
1	–	.04	.03	.03	.02	.02	.02	.02	.02
	.05	.05	.04	.03	.03	.03	.02	.02	.02
2	–	.08	.06	.05	.05	.04	.04	.03	.03
	.10	.09	.08	.07	.06	.05	.05	.04	.04
3	–	.11	.09	.08	.07	.06	.06	.05	.05
	.15	.14	.11	.10	.09	.08	.07	.06	.06
4	–	.15	.12	.11	.09	.08	.08	.07	.06
	.20	.18	.15	.13	.11	.10	.09	.08	.08
5	–	.19	.16	.13	.12	.11	.09	.09	.08
	.25	.23	.19	.16	.14	.13	.11	.10	.09
6	–	.23	.19	.16	.14	.13	.11	.10	.09
	.30	.27	.23	.19	.17	.15	.14	.12	.11
7	–	.26	.22	.19	.16	.15	.13	.12	.11
	.35	.32	.27	.23	.20	.18	.16	.14	.13
8	–	.30	.25	.21	.19	.17	.15	.14	.13
	.40	.36	.30	.26	.23	.20	.18	.17	.15

Males – Top row                      Females – Bottom Row  
Subtract .015 every hour after drinking



Micr... im Pregnancy Tests

PROTECTING THE UNEXPECTED

# THINK BEFORE YOU DRINK.

**Can You Be? Test and Seal!**

Prevention testing every two weeks will alert a mother to an unexpected pregnancy in time to refrain from drinking alcohol before damage is done to the fetus.

**Nature's Grace Period**

If a mother knows she is pregnant by day 28, she can avoid alcohol for the first 14 days of pregnancy. After that, the damage from alcohol is permanent.

**HEALTHY BRAINS FOR CHILDREN**

Alcohol can damage the brain of a developing fetus, leading to learning disabilities and other problems.



# ALCOHOL & INCREASED RISK OF COMPLICATIONS w MOTHER

- Miscarriage
- Preterm labor
- Placenta abruption
- 1<sup>st</sup> & 2<sup>nd</sup> trimester bleeding
- Intra-amniotic infection



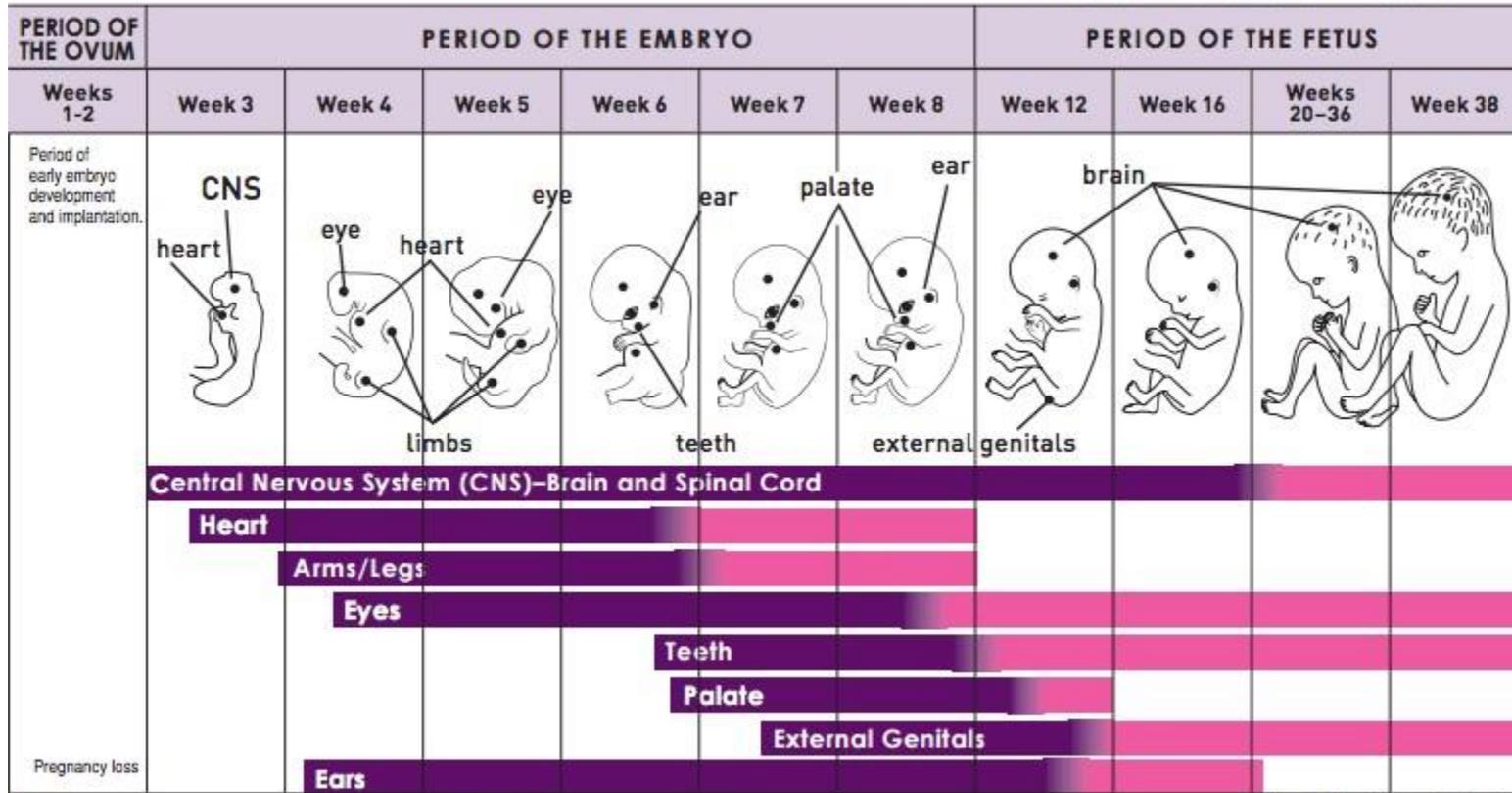
# ALCOHOL & INCREASED RISK OF COMPLICATIONS w FETUS

- Stillbirth
- Low birth weight
- Congenital abnormalities
- Cognitive deficits
- Behavioral problems



# FETAL DEVELOPMENT CHART

This chart shows vulnerability of the fetus to defects throughout 38 weeks of pregnancy.\*  
• = Most common site of birth defects



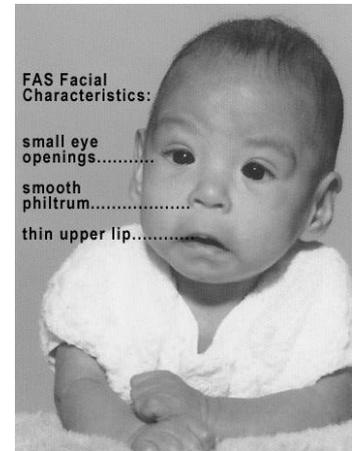
  Period of development when major defects in bodily structure can occur.  
  Period of development when major functional defects and minor structural defects can occur.

Adapted from Moore, 1993 and the National Organization on Fetal Alcohol Syndrome (NOFAS) 2009  
 \*This fetal chart shows the 38 weeks of pregnancy. Since it is difficult to know exactly when conception occurs, health care providers calculate a woman's due date 40 weeks from the start of her last menstrual cycle.



# FETAL ALCOHOL SPECTRUM DISORDERS

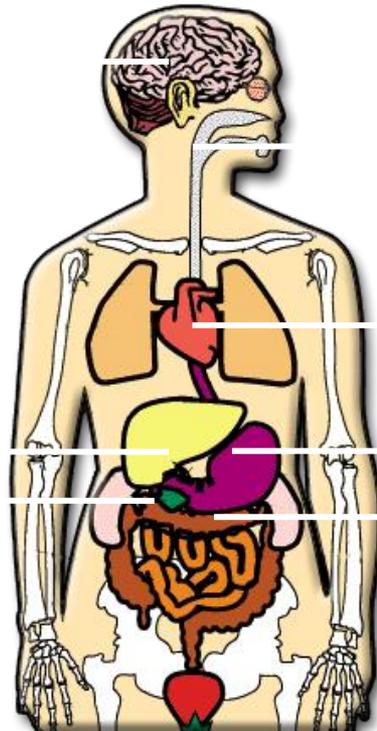
- Includes
  - Fetal Alcohol Disorder
  - Alcohol related birth defects
  - Alcohol related neurodevelopmental disorders
- Prevalence
  - @ 7.7 per 1000 live births worldwide (range 0.2-9/1000)
  - 1 in 67 mothers who consumed alcohol during pregnancy
  - 0.2-1.5 per 1000 live births in U.S.
- Factors
  - Amount of alcohol, timing of exposure, tobacco use
  - Maternal age, genetics, body composition, nutrition
- Features
  - Microcephaly, short height, low body weight,
  - Short palpebral fissures, smooth philtrum, thin upper lip
  - Poor coordination, low intelligence, behavioral problems, and sight problems





# EFFECTS OF CHRONIC ALCOHOL USE ON BODY SYSTEMS

Cognitive deficits  
Coordination impairment



Oral/esophageal cancer

Cardiomyopathy  
arrhythmias  
hypertension  
stroke

Cirrhosis  
Pancreatitis

Stomach ulcers, gastritis

Duodenal ulcers



# DISEASES ASSOCIATED WITH CHRONIC ALCOHOL USE:

MAY COMPLICAT PREGNANCY

## Primary Diseases

Alcohol Withdrawal

Alcoholic  
cardiomyopathy

Alcoholic gastritis

Alcoholic liver  
cirrhosis

Alcoholic neuropathy

## Secondary Diseases

Cancer (lip, mouth, pharynx, esophagus, larynx, liver, stomach)

Diabetes

GI disease

Heart disease (HTN, stroke)

Liver disease

Pancreatitis (acute, chronic)

Pneumonia/influenza/tuberculosis

Malnutrition (Wernicke Korsakoff's)



# ALCOHOL INTOXICATION

- Typically seen within 5-30 minutes
- Onset & duration depend on tolerance
- Correlates with blood alcohol level  
(in non-tolerant individuals)
- Gender & race important in metabolism
- May be life-threatening due to respiratory depression



# ALCOHOL INTOXICATION

- slurred speech
- incoordination
- unsteady gait
- nystagmus
- flushing
- feeling of warmth
- hypothermia
- diuresis
- hypotonia
- nausea/vomiting
- diplopia
- decreased visual acuity
- mood lability
- decreased inhibitions
- impaired judgment
- impaired motor skills
- confusion
- disorientation
- impaired attention
- stupor/coma



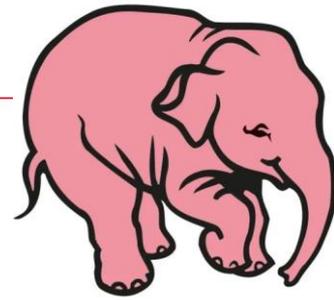
# ALCOHOL INTOXICATION:TX

- Largely supportive
  - reestablish airway
  - correct fluid and electrolyte imbalances
  - examine for evidence of trauma
  
- Coffee doesn't cut it!!!



# NEUROPHARMACOLOGY: SUMMARY

<u>EXPERIENCE</u>	<u>TRANSMITTER/RECEPTOR</u>
Euphoria/pleasure	Dopamine, Opioids
Anxiolysis/ataxia	↑ GABA
Sedation/amnesia	↑ GABA + ↓ NMDA
Nausea	5HT <sub>3</sub>
Neuroadaptation	NMDA, 5HT
Stress	CRF
Withdrawal	GABA, NMDA (↑ Ca, ↓ Mg)



# ALCOHOL WITHDRAWAL

- 95% self-limited & uncomplicated
- Absolute alcohol level less important
  - decrease in level that seems important
- Can be fatal due to:
  - delirium tremens or seizures
- Most cases progress in a fairly predictable fashion and time-course



# ALCOHOL WITHDRAWAL: STAGE I

- Typically seen within 24 hours of last use
- Symptoms generally abate in 24-48 hours
- Vast majority do not progress to Stage II
  - tremulousness
  - hypertension
  - tachycardia
  - diaphoresis
  - nausea
  - hyperactive reflexes
  - fever
  - anxiety
  - agitation
  - derealization (mild)
  - slowed thinking
  - clouded sensorium
  - insomnia
  - headache



# ALCOHOL WITHDRAWAL: STAGE II

- Typically seen within 48 hours
- As in Stage I but more severe
- In addition, see hallucinations: “hallucinosis”
  - generally auditory
  - may be visual
  - generally non-threatening
- Usually with intact reality testing



# ALCOHOL WITHDRAWAL: STAGE III

- “Delirium Tremens” “DTs”
- <1% of cases
- Typically seen about 72 hrs after use
- May last three to seven days (or more)
- Rarely, see w/o going through Stage II
- Usually seen in patients w another, complicating condition
- Hallucinations may be:
  - visual, tactile, auditory, olfactory
  - often threatening
- Typically very anxious, fearful, labile
- Marked disorientation



# ALCOHOL WITHDRAWAL SEIZURES

- Independent of delirium tremens
- Generalized tonic-clonic
- Typically seen 12-48 hrs after last use
- May occur as much as a week later
- < 5% of withdrawal cases
- Most are self-limited
- May occur despite normal vital signs



# ALCOHOL WITHDRAWAL IN PREGNANCY

- Very few studies
- Theoretical increased risk in pregnancy because of increased cortisol w withdrawal
- Hypertension associated with withdrawal potentially more problematic
  - May decrease placental perfusion



# NEONATAL ALCOHOL WITHDRAWAL

- Tremors
- Hypertonia
- Restlessness
- Excessive mouthing movements
- Inconsolable crying
- Reflex abnormalities

\*Benzodiazepine withdrawal similar



# ALCOHOL WITHDRAWAL: TREATMENT

- Supportive measures very important may be the only treatment needed for most
  - correct electrolyte and fluid imbalances
- Benzodiazepines
- Barbiturates
- Anti-convulsants
- Beta-blockers
- Ethanol
- Other

Propofol, Precedex, GHB, chlormethiazole



# ALCOHOL WITHDRAWAL: TREATMENT IN PREGNANCY

- Very little actual data in pregnancy
- Supportive measures very important & may be the only treatment needed for most
  - More pregnant women are younger and drinking less than other adults who experience significant withdrawal
- Benzodiazepines safest medication
  - Category D
  - No clear evidence which is better
- Gabapentin
  - Category C
  - Some evidence that may help in combination with benzo



# BENZODIAZEPINES IN PREGNANCY

- Unclear teratogenicity (MM-Major Malformations)
  - Most data on diazepam (much from 1960s-1970s)
    - Some increase in cleft lip and palate
  - Dolovich Meta-analysis
    - Increase MM Seen in Case-Control Studies but not Cohort Studies
    - Poor control for benzodiazepine used, duration of exposure, gestational age, dose, concurrent substance use
  - Bellantuono Systemic Review
    - No evidence of MM in 1<sup>st</sup> trimester exposure to alprazolam, clonazepam, chlordiazepoxide, diazepam
    - High dose (suicide attempts) did have increased spontaneous abortions
  - Swedish National Health Registry (1000 infants)
    - No higher rates of MM/cardiac defects



# BENZODIAZEPINES IN PREGNANCY

- “Floppy Infant Syndrome”
  - Mild sedation, hypotonia, decrease suck, apneic spells
  - Can persist for hours to months
- Thought to result from benzodiazepine exposure at time of delivery



# CIWA (Clinical Institute Withdrawal Assessment)

**Nausea and vomiting.** Ask "Do you feel sick to your stomach? Have you vomited?"

Observation:

- 0—No nausea and no vomiting
- 1—Mild nausea with no vomiting
- 2—
- 3—
- 4—Intermittent nausea with dry heaves
- 5—
- 6—
- 7—Constant nausea, frequent dry heaves, and vomiting

**Tremor.** Ask patient to extend arms and spread fingers apart.

Observation:

- 0—No tremor
- 1—Tremor not visible but can be felt, fingertip to fingertip
- 2—
- 3—
- 4—Moderate tremor with arms extended
- 5—
- 6—
- 7—Severe tremor, even with arms not extended

**Paroxysmal sweats**

Observation:

- 0—No sweat visible
- 1—Barely perceptible sweating; palms moist
- 2—
- 3—
- 4—Beads of sweat obvious on forehead
- 5—
- 6—
- 7—Drenching sweats

**Anxiety.** Ask "Do you feel nervous?"

Observation:

- 0—No anxiety (at ease)
- 1—Mildly anxious
- 2—
- 3—
- 4—Moderately anxious or guarded, so anxiety is inferred
- 5—
- 6—
- 7—Equivalent to acute panic states as occur in severe delirium or acute schizophrenic reactions

**Agitation**

Observation:

- 0—Normal activity
- 1—Somewhat more than normal activity
- 2—
- 3—
- 4—Moderately fidgety and restless
- 5—
- 6—
- 7—Paces back and forth during most of the interview or constantly thrashes about

**Tactile disturbances.** Ask "Do you have any itching, pins-and-needles sensations, burning, or numbness, or do you feel like bugs are crawling on or under your skin?"

Observation:

- 0—None
- 1—Very mild itching, pins-and-needles sensation, burning, or numbness
- 2—Mild itching, pins-and-needles sensation, burning, or numbness
- 3—Moderate itching, pins-and-needles sensation, burning, or numbness
- 4—Moderately severe hallucinations
- 5—Severe hallucinations
- 6—Extremely severe hallucinations
- 7—Continuous hallucinations

**Auditory disturbances.** Ask "Are you more aware of sounds around you? Are they harsh? Do they frighten you? Are you hearing anything that is disturbing to you? Are you hearing things you know are not there?"

Observation:

- 0—Not present
- 1—Very mild harshness or ability to frighten
- 2—Mild harshness or ability to frighten
- 3—Moderate harshness or ability to frighten
- 4—Moderately severe hallucinations
- 5—Severe hallucinations
- 6—Extremely severe hallucinations
- 7—Continuous hallucinations

**Visual disturbances.** Ask "Does the light appear to be too bright? Is its color different? Does it hurt your eyes? Are you seeing anything that is disturbing to you? Are you seeing things you know are not there?"

Observation:

- 0—Not present
- 1—Very mild sensitivity
- 2—Mild sensitivity
- 3—Moderate sensitivity
- 4—Moderately severe hallucinations
- 5—Severe hallucinations
- 6—Extremely severe hallucinations
- 7—Continuous hallucinations

**Headache, fullness in head.** Ask "Does your head feel different? Does it feel like there is a band around your head?"

Do not rate for dizziness or lightheadness; otherwise, rate severity.

- 0—Not present
- 1—Very mild
- 2—Mild
- 3—Moderate
- 4—Moderately severe
- 5—Severe
- 6—Very severe
- 7—Extremely severe

**Orientation and clouding of sensorium.** Ask "What day is this? Where are you? Who am I?"

Observation:

- 0—Oriented and can do serial additions
- 1—Cannot do serial additions or is uncertain about date
- 2—Date disorientation by no more than two calendar days
- 3—Date disorientation by more than two calendar days
- 4—Disorientated for place and/or person

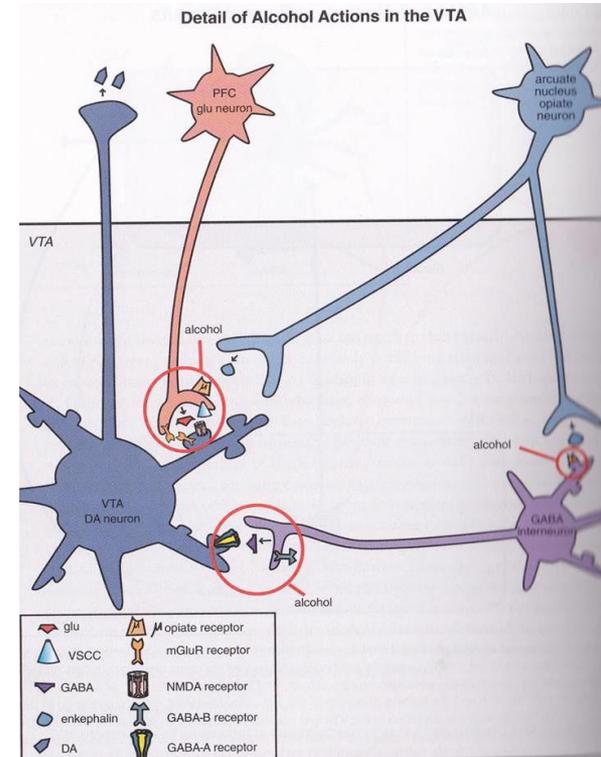
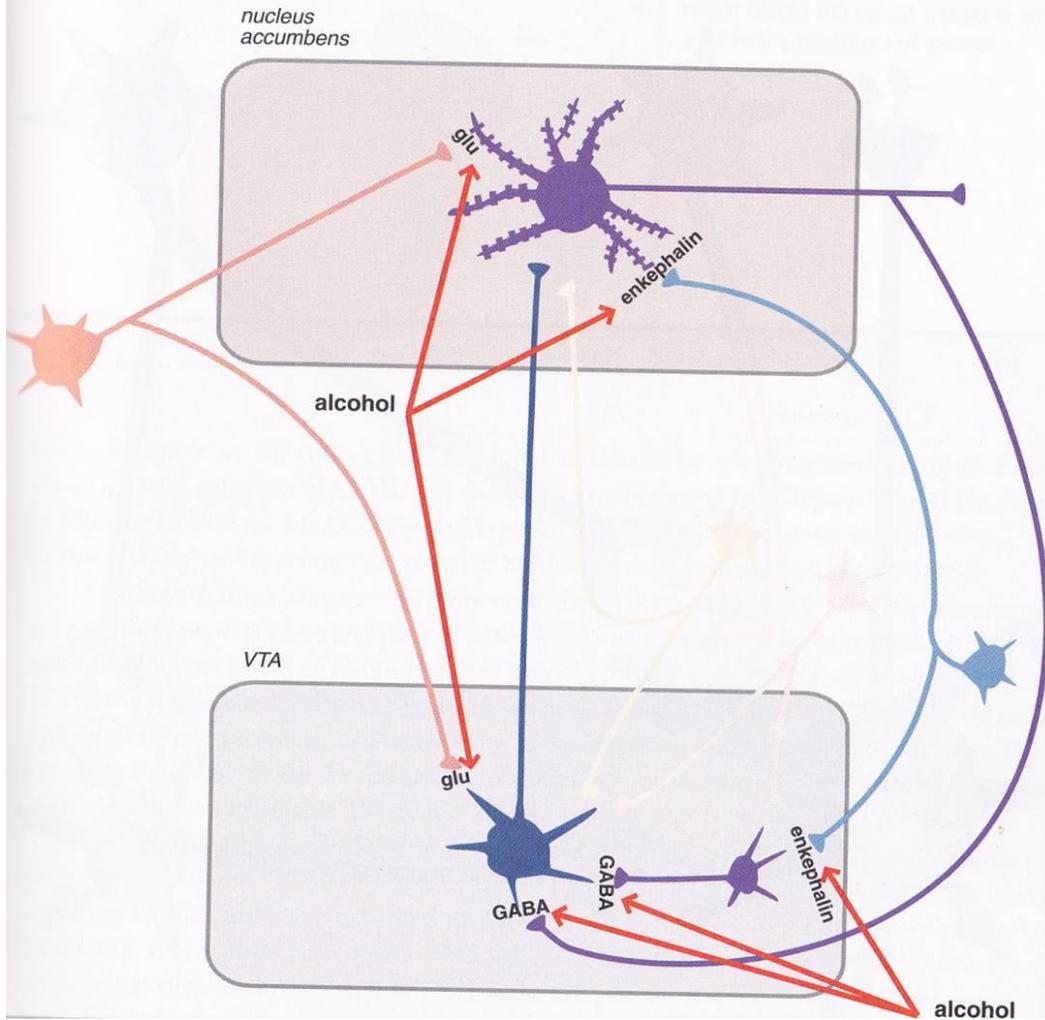


# WERNICKE'S ENCEPHALOPATHY

- Not a direct result of alcohol
- A nutritional deficiency related to poor diet seen in some chronic alcoholics
- Often progresses to an Alcohol-Induced Persisting Amnestic Disorder even if treated
- Prevention with thiamine is crucial
  - nystagmus
  - lateral gaze paralysis
  - ataxia
  - confusion
  - diplopia
  - short-term memory defects



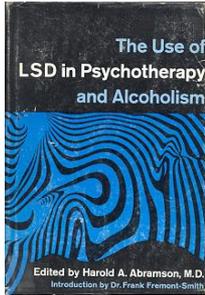
### Actions of Alcohol on Reward Circuits





# MAINTENANCE TREATMENTS

- FDA Approved
  - Disulfiram (Antabuse)
  - Naltrexone (Revia; Vivitrol)
  - Calcium acetylhomotaurinate (Acomprosate; Campral)
- Experimental/Not Approved
  - Ondansetron (5-HT<sub>3</sub> receptor antagonist)
  - Gabapentin (Calcium channel GABAergic modulator)
  - Topiramate (non-NMDA glutamate receptor modulator)
  - Tiapride (dopamine antagonist)
  - Calcium carbimide (acetaldehyde dehydrogenase inhibitor)
  - Varenicline (partial agonist of  $\alpha 4\beta 2$  nicotinic ACh receptors)





# DISULFIRAM

- Antabuse
- Inhibits aldehyde dehydrogenase
- When taken with alcohol, ↑ acetaldehyde leads to nausea, dizziness, headache, flushing  
Occasionally, cardiac problems, hypotension and death
- Aversive conditioning
- Side effects  
drowsiness, lethargy, hypertension, peripheral neuropathy
- Liver toxicity
- Copper chelating agent
- Not well studied in controlled trials



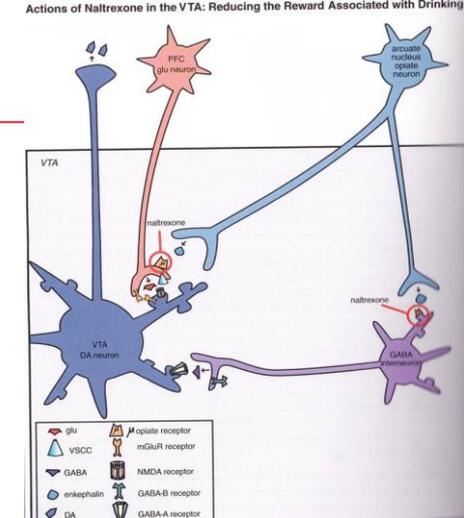
# DISULFIRAM IN PREGNANCY

- Animal studies
  - No effect on litter size, abortion or weight but **reduced brain weight**
    - Likely because of lack of copper
- Human studies
  - Very little evidence in pregnancy
  - Case report- congenital abnormalities in 29% of infants whose mothers took disulfiram; most took other medications and also drank alcohol
  - Case report- congenital abnormality in 1 of 25 babies



# NALTREXONE

- *Mu* opioid antagonist
- Effects through decreasing reinforcement of alcohol
- Reduction in heavy drinking, days of drinking
- Some increased total abstinence
- Generally well tolerated
- Occasional nausea, headache, sedation, anxiety
- Very rare increase in liver function tests
- A few negative studies
- Available orally and long acting injection





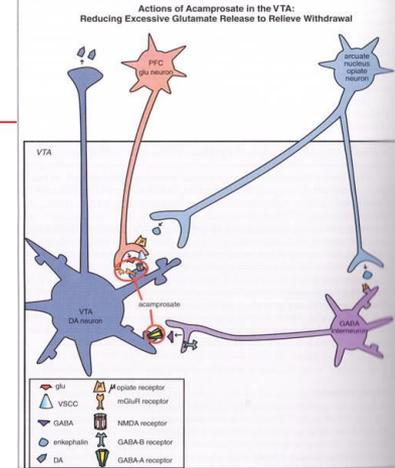
# NALTREXONE IN PREGNANCY

- Animal studies
  - No evidence of teratogenicity
  - Some increased early fetal loss at doses 5-18 Xs the recommended therapeutic dose
  - Some association with increased birth weight
- Human studies
  - No studies in women with AUD
  - Some studies in women with OUD
    - Exposed babies born earlier
    - Some increased urogenital birth defects but may have been related to opioid use



# ACAMPROSATE

- NMDA Glutamate receptor modulator
- Appears to have effects through decreasing craving by normalizing glutamate levels
- Reduction in heavy drinking, days of drinking
- Some increased total abstinence
- Most common side effect diarrhea, nausea
- FDA warning for increased suicide/violence
- No liver toxicity
- Some negative studies
- 3 x per day dosing can be problematic





# ACAMPROSATE IN PREGNANCY

- Animal studies
  - No evidence of teratogenicity
  - Possible neuroprotective properties
    - Reduce impact of alcohol on the developing fetus
- Human studies
  - Study in Australia
    - Less hospitalizations pre & post delivery compared to group who drank alcohol & control group
    - Exposed fetus w no difference in birth weight, SFGA, birth defects
  - Case series
    - 18 cases w 1<sup>st</sup> trimester exposure
      - 2 spontaneous abortions; 2 with birth abnormalities
      - No comparison group



*Offering support to prescribers and their practices in addressing the needs of their pregnant and postpartum patients with substance use disorders*

**1-855-337-MACS (6227)**

**All Services are FREE**

- Phone consultation for clinical questions
- Education and training opportunities related to substance use disorders and chronic pain management
- Assistance with addiction and behavioral health resources and referrals
- Technical assistance to practices implementing or expanding office-based addiction treatment services
- MACS TeleECHO™ Clinics: collaborative medical education through didactic presentations and case-based learning

