Alcoholism

Men’s Health Symposium 2016

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Disclosures

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Prologue

06/16/2016

Saint Vincent Hospital
F. Scott Fitzgerald ~ 1915

Zelda Sayre Fitzgerald ~ 1919
7/24/1900 - 5/10/1949
Earnest Hemingway - 1923

Hadley and Earnest Hemingway
Ethanol

- First mead brewed from fermented honey ~ 8000 BC *
- Ethanol - Small, water-soluble - MW = 46 Daltons
- Volume of Distribution = TBW (Total Body Water)
- Penetrates all body tissues
- Rapidly crosses the BBB (Blood Brain Barrier)
- Crosses the placenta → fetus has BAC ≈ mother’s
- Pharmacology -
  - broad-spectrum, short-acting sedative
  - Active at CNS ligand-gated and voltage-gated ion channels

What is a drink?

- Three Expressions of Alcohol content
  - Proof -
  - ABV (Alcohol By Volume) usually “Percent ABV”
  - ABW (Alcohol By Weight) expressed in grams
- “Standard Drink" of alcohol is defined to be
  - ABV = 1.5 oz of 80-proof alcohol; 0.6 oz. Ethanol
  - ABW = 14 Grams of ethanol
What is Proof?

- **British Proof** – established by the Cromwell Parliament contained 11 parts by volume of ethanol to 10 parts water = 114 US Proof ~57% ethanol - used to determine what alcoholic beverages were taxed.
- British Navy Sailors - paid in rum, they wanted ‘proof’ that it was not watered down → the proof = mixed with gunpowder, does the mixture ignite? → requires ~57% Alcohol (ABV) → Origin of the term ‘firewater’?
- **UK** The value 100 and the term ‘proof spirit’ correspond to a mixture of ethyl alcohol and water, which, compared to an equal volume of distilled water, has $\frac{12}{13} = 0.9230769 \approx$ the weight when both are weighed in air at 51°F (10.56°C). This corresponds to a proportion of alcohol in the mixture of about 49.3% by weight, 57.1% by volume.
- US Proof is simpler, double the alcohol percentage volume at 60°F
  - 100 Proof = 50% Ethanol
  - 200 Proof = 100% Ethanol is the Maximum
- In the UK the proof-to-ABV ratio is 7:4, in the US it is 2:1

Absorption of Ethanol

Rapidly Absorbed from the GI Tract –

- 80-90% within 60 minutes
- Peak Blood Levels 30-90 minutes after ingestion
- Delayed or ↓ absorption common after eating
- Drinking on an empty stomach ↑ absorption
- High ABV in beverage increases peak blood levels
- Carbonated alcoholic beverages ↑ absorption
- Slow, sad country music appears to ↑ drinking
**Distribution of Ethanol**

Volume of Distribution = Total Body Water → all tissues
Rapidly crosses the BBB → Readily Available to the Brain
Blood Alcohol Concentration (BAC) maintained by back-diffusion → **Always** Readily Available to the Brain

**Men** - ↑ Muscle → ~ 60% mass is TBW → ↑ dilution → ↓ BAC
**Women** - ↑ Adipose → ~ 55% mass is TBW → ↑ dilution → ↑ BAC

Women appear to become more impaired than men after drinking equivalent amounts of alcohol, achieving higher BAC even when doses are adjusted for body weight. *
Readily crosses the placenta → fetus has BAC ≈ mother’s

* Mumenthaler et. al. Alcohol Research and Health Volume 23 No. 1 1999

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**Metabolism and Elimination**

![Metabolism Diagram]

**ADH** = Alcohol Dehydrogenase  **ALDH** = Aldehyde Dehydrogenase

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6/15/2016  6/16/2016
**Metabolism and Elimination**

Ethanol is metabolized through 4 pathways

1. Enzymatic Oxidation by ADH-ALDH System
2. Microsomal Ethanol Oxidizing System – CYP450 2E1
3. Catalase System
4. Esterification - FFA to Fatty Acid Ethyl Esters (FAEE)

**Metabolism of Alcohol**

Men
- 20% metabolized in the stomach by alcohol dehydrogenase
- Ethanol 80% metabolized by the liver
- ~ 60% mass is TBW increasing diluting effect (↑ Muscle)

Women
- 0% metabolized in the stomach - No GI Tract ADH
- ~ 100% Ethanol metabolized by the liver
- ~ 55% mass is TBW, (↑ adipose issue)

Women may become more impaired than men after drinking equivalent amounts of alcohol, achieving higher BAC even if dose adjusted for body weight. *

* Mumenthaler et. al. Alcohol Research and Health Volume 23 No. 1 1999
Blood Alcohol Content (BAC)

- Amount of alcohol present in 100 mLs (or 1 dL) of blood - expressed in decimals as grams/100 mLs or in milligrams as whole numbers - mg% (mg/dL)
- Thus, 80 mg of alcohol in 100 mLs may be expressed as 80 mg% or as 0.08g in 100 mLs which is 0.08%
- A person with BAC of 0.19 gram% or 190 mg% (190 mg/dL) both have 190 mg of ethanol 100 mLs,
BAC and Back-Extrapolation

Alcohol goes through four different phases in the body: absorption, distribution, metabolism and excretion. Metabolism and excretion are often combined into one term, the "burn-off" rate which ranges from 0.01-0.025 % per hour with the alcohol dehydrogenase enzyme, but can be higher in frequent drinkers who use a second enzyme (CYP 2E1) to increase excretion.

BAC and Back-Extrapolation

Alcohol Intoxication

Approximate Blood Alcohol Content (BAC) In One Hour

<table>
<thead>
<tr>
<th>Drinks</th>
<th>Body Weight In Pounds</th>
<th>Influenced</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>100</td>
<td>.05</td>
</tr>
<tr>
<td>2</td>
<td>120</td>
<td>.04</td>
</tr>
<tr>
<td>3</td>
<td>140</td>
<td>.03</td>
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<td>4</td>
<td>160</td>
<td>.02</td>
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<td>6</td>
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<td>.01</td>
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<tr>
<td>7</td>
<td>220</td>
<td>.01</td>
</tr>
<tr>
<td>8</td>
<td>240</td>
<td>.01</td>
</tr>
</tbody>
</table>

Subtract .015 for each hour after drinking.

One drink equals 1.5 oz. of 80 proof liquor (40%), 12 oz. beer (4.5%), or 5 oz. wine (12%).
Note: The figures are averages and may vary based on the amount of food in your stomach.
Intoxication - Calculators

• http://rethinkingdrinking.niaaa.nih.gov/ToolsResources/CocktailCalculator.asp
• http://my.clevelandclinic.org/health/tools-quizzes/Blood_Alcohol_Calculator
• http://www.globalrph.com/blood_alcohol_calculator.htm
• http://celtickane.com/projects/blood-alcohol-content-bac-calculator/

CNS Equilibrium

Inhibitory (-) Tone = Excitatory (+) Tone

GABA

NE  Ach  5HT  Glu

INHIBITORY (-)  EXCITATORY (+)
Alcohol Intoxication

- Normal = No Etoh
- Intoxication = Acute Etoh

Inhibition (-) = Excitation (+)

Intoxication - Harms

- Alcohol is the Number 1 Date Rape Drug
- Alcohol Poisoning
- Motor Vehicle (and other) Accidents
- Suicide Attempts
- Suicide Completions
- “Incidents” in personal/professional life
The Road Trip

F. Scott Fitzgerald ~ 1915
His talent was as natural as the pattern that was made by the dust on a butterfly’s wings. At one time he understood it no more than the butterfly did and he did not know when it was brushed or marred. Later he became conscious of his damaged wings and of their construction and he learned to think. He was flying again and I was lucky to meet him just after a good time in his writing if not a good one in his life.

Earnest Hemingway A Moveable Feast 1964
Scott was a man then who looked like a boy with a face between handsome and pretty. He had very fair wavy hair, a high forehead, excited eyes and a delicate long-lipped Irish mouth that, on a girl, would have been the mouth of a beauty. His chin was well built and he had good ears and a handsome, almost beautiful unmarked nose. This should not have added up to a pretty face, but that came from the coloring, the very fair hair and the mouth. The mouth worried you until you knew him and then it worried you more.

Earnest Hemingway  A Moveable Feast 1964
The Train to Lyon
Earnest Hemingway A Moveable Feast 1964

The Drive to Paris
Earnest Hemingway A Moveable Feast 1964
Scott had obviously been drinking before I met him, and he looked as though he needed a drink, I asked him if he did not want one in the bar before we set out. He told me he was not a morning drinker and asked if I was. I told him it depended entirely on how I felt and what I had to do and he said that if I felt that I needed a drink, he would keep me company so I would not have to drink alone. So we had a whisky and Perrier in the bar while we waited for the lunch and both felt much better.

Earnest Hemingway A Moveable Feast 1964

Zelda and the Car Top

At the garage...it was astonishing to find that the small Renault had no top. The top had been damaged in unloading the car in Marseilles, or it had been damaged in Marseilles in some manner - Scott explained it a little vaguely - and Zelda had ordered it cut away and refused to have it replaced. His wife hated car tops, Scott told me...
Halted by the Rain

We were halted by rain about an hour north of Lyon... In that day we were halted about ten times... Scott was very happy when we drank the white Maconnais at each of our stops. At Mâcon I bought four more bottles of excellent wine which I uncorked as we needed them. I am not sure Scott had ever drunk wine from a bottle before and it was exciting to him...

Earnest Hemingway A Moveable Feast 1964

Congestion of the Lungs

But by early afternoon, he had begun to worry about his health. He told me about two people who had died of congestion of the lungs recently. Both of them had died in Italy and he had been deeply impressed... I urged him to take another drink of Mâcon, since a good white wine, moderately full-bodied but with a low alcohol content, was almost a specific against the disease.
The Thermometer

I was getting tired of the literary life, if this was the literary life I was leading...I found the waiter and gave him money to buy a thermometer and a tube of aspirin, and ordered two citron presses and two double whiskies...It was a bath thermometer with a wooden back and enough metal to sink it into the bath... ‘Is that the only one you could get? ... You’re lucky it’s not a rectal thermometer.’

Dinner

Drinking before breakfast
2 Whiskeys after breakfast - with EH
Six (?) bottles of wine on the road - with EH
Four double whiskies before supper - with EH
‘Our clothes came...and we dressed and went downstairs to have dinner. Scott was a little unsteady now and he looked at people out of the side of his eyes with a certain belligerency.

Carafe of Fleury with appetizers - with EH
Bottle of Montagny with supper - with EH

He passed out at the table with his head on his hands. It was natural and there was no theater about it and it even looked as though he were careful not to spill or break things.
But it was hard to accept him as a drunkard, since he was affected by such small quantities of alcohol…it had never occurred to me that sharing a few bottles of fairly light, dry Mâcon could cause chemical changes in Scott that would turn him into a fool. There had been the whiskey and Perrier in the morning but, in my ignorance of alcoholics then, I could not imagine that harming anyone who was driving in an open car in the rain. The alcohol should have been oxidized in a very short time.

Earnest Hemingway, *A Moveable Feast*, 1964

~ 29 Standard Drinks over 12 hours = average BAC = 69
Drinking and Alcoholism

- Why do some people keep drinking, despite adverse consequences?
- What does it mean to be able to ‘hold your liquor’?
- Is it possible to help people who cannot seem to stop drinking on their own?
- If it is possible, how?

How much is "too much?"

- Drinking becomes “too much” when:
  - causes or elevates the risk for alcohol-related problems
  - complicates the management of other health problems.
- NIAAA: increased risk for alcohol-related problems correlates with
  - Men who drink 5 or more standard drinks in a day (or 15 or more per week)
  - Women who drink 4 or more in a day (or 8 or more per week).
- NB: There is no safe level in pregnancy
Drinking Patterns - NIAAA

- **NIAAA** - National Institute on Alcohol Abuse and Alcoholism:

- **Moderate Drinking** -
  - Women: 1/day
  - Men: 2/day ≠ ‘a couple’

- **Low Risk Drinking** = ‘Low Risk for Developing AUD’ (~ 2% have AUD)
  - Women: ≤ 3/day ≤ 7/week
  - Men: ≤ 4/day ≤ 14/week

- **NIAAA Binge Drinking** - drinking pattern that achieves BAC = 80 mg%
  - Women: 4 drinks/2 Hours
  - Men: 5 drinks/2 hours

- **SAMHSA Binge Drinking** - drinking 5/drinks on 1 day of past 30 days
- **SAMHSA Heavy Drinking** - 5+ drinks/sitting on 5+ of past 30 days

- **No Safe Level in Pregnancy**

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DSM-5 Substance Use D/O

**Milder Symptoms**
- Longer Use/Larger Amount
- ↑ Time Spent - Obtain Use
  Recover e.g. hangover
- Craving, Urge, Desire to Use
- Attempts to Control/Cut Back

“5 or 4 is a Moderate Score
Mild is Less, Severe is More” *

**More Severe Symptoms**
- Tolerance
- Role Failure
- Activities Reduced
- Social Problems
- Health Problems
- Dangerous Use/Physical Hazard
- Withdrawal Syndrome

Long Time Craving Control → TRASHD → Withdrawn*

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*Hillary Connery MD PhD - Clinical Director, Division of Alcohol and Drug Use, McLean Hospital
**DSM-5 Alcohol Use D/O (AUD)**

**Milder Symptoms**
- Longer Use/Larger Amount
- ↑ Time Spent - Obtain Use Recover e.g. hangover
- Craving, Urge, Desire to Use
- Attempts to Control/Cut Back

**More Severe Symptoms**
- Tolerance
- Role Failure
- Activities Reduced
- Social Problems
- Health Problems
- Dangerous Use/Physical Hazard
- Withdrawal Syndrome

DSM -5 (-) Legal Criterion, (-) Abuse/Dependence Distinction (+) Craving

Alcohol Use Disorder = > 2 Symptoms
Mild = 2-3 Symptoms
Moderate = 4-5 Symptoms
Severe = 6 + Symptoms

“5 or 4 is a Moderate Score”
Mild is Less, Severe is More” *

Addiction = loss of self-control AEB compulsive drug taking despite desire to stop


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**Spectrum of Drinking Patterns**

**US General Population - NB: Category ≠ Harm**

- Ever Take a Drink 95%
- Abstinent or Low Risk Drinkers 70%
- At-Risk Drinkers (above NIAAA Limits) 21%
  - Analogous to ↑BP or ↑Lipids prior to end organ damage
  - Most Heavy Drinkers have no current symptoms, but
  - At risk for liver injury, depression, AUD, etc.
  - 40% of daily/near-daily heavy drinkers do not meet AUD criteria
  - Only 20 - 40% of people with alcoholic cirrhosis also have AUD

- DSM Alcohol Use Disorder (AUD) ~ 9%
  - 70% AUD have a single episode - lasting 3-5 years
  - People with moderate -severe AUD have significant changes in CNS motivation/reward circuits

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**Spectrum of Drinking Patterns**

- **Abstinent/Low Risk**
  - Never Exceed NIAAA Daily Limits
  - 70%

- **At Risk - Exceed NIAAA Limits**
  - 21%

- **AUD Mild - Moderate**

- **AUD Severe Chronic ‘Addiction’**

**Complications over Life Cycle**

- **Medical**
- **Neuropsychiatric** - TBI risk, Dementia risk
- **Psychiatric** - ‘Wreckage of the Past’
  - ↑ impulsive poor decisions
  - ↑ alienation from others
- **Family**
- **Social**
- **Legal**
- **Employment**
Complications - Women

• Alcoholism in Women
  – Telescoping - Women develop alcoholic liver disease after a comparatively shorter period of heavy drinking and at a lower level of daily drinking than men.
  – E.g. SVH Patient - End Stage Liver Disease at 21

• Pregnancy

FAS remains the leading known preventable cause of mental retardation
Complications - Suicide

• Lifetime Suicide Risk for Schizophrenia, Affective Disorder, Substance Use Disorder - Inskip (1998)
  - Schizophrenia 4%
  - Affective D/O 6%
  - Substance Use D/O 7%

• 40 - 60% of completed suicides in USA/Europe are alcohol/drug involved - Editorial: Dying for a Drink: British Medical Journal 2001

• 43% of completed suicides had Alcohol Dependence - Henriksson (1993)

• States with lower drinking age (18) have higher (+8%) suicide rates than states with higher drinking age (21) for that age - Birckmayer (1999)

Complications - Suicide

• SAMHSA TIP 50: Addressing Suicidal Thoughts and Behaviors in Substance Abuse Treatment
Bipolar Alcoholism

• “Bipolar Alcoholism” - Roger Weiss MD
• Take your Medications
• Don’t Drink
• But take your medications, no matter what

Addiction
Victor and Adams (1953)

- Maurice Victor and Raymond D Adams (MGH, HMS) studied the relationship between the clinical effects of alcohol intoxication and progression into alcohol withdrawal in 226 men admitted to Boston City Hospital.
- They described symptoms and time course of 4 syndromes:
  - Tremor
  - Seizures
  - Hallucinations
  - Delirium Tremens
- Correlated severity with time spent drinking - dose dependent!

Harris Isbell MD (1955)

- Harris Isbell MD (6/7/1910 - 12/23/1994)
- Director of Research for NIMH Addiction Research Center at the Public Health Service Hospital in Lexington, KY (1945-1963).
- Developed an experimental model using patient (prisoner) ‘volunteers’
- Confirmed the dose-dependent relationship of AWS to alcohol intake - up to ~ 1 quart 80 proof/day = 21 drinks/day
- N=4 - 250-350 mL of 95% Etoh x 7-34 days leads to minor AWS
  - 9 - 12 drinks/day
- N=6 - 380-490 mL of 95% Etoh x 48-87 days leads to minor withdrawal + Hallucinations, Seizures (1/3), DT’s (1/2)
  - 13 - 17 drinks/day

Risk to Your Patient of AWS

- Mortality in DT's is between 5-20% because:
  - The intense excitatory CNS outflow results in an incredible "Total Body Stress Test" exposing whatever "fault lines" are produced by co-occurring medical problems.
  - Pulse can exceed 160,
  - BP can exceed 220/160
  - A patient with DT's had the highest temperature ever recorded in a human being = 45 C˚ = 110 F˚
  - Fluid losses can be profound
  - Patients with COPD may not be able to meet O2 requirements

Alcohol Withdrawal

- Consequence of Neuroadaptation
- Kindling
- It takes as little as 3 days of heavy drinking to trigger major AWS
Repeated Drinking $\rightarrow$ Tolerance

Inhibitory (-) Tone = Excitatory (+) Tone

GABA  NE  Ach  5HT  Glu
INHIBITORY (-)  EXCITATORY (+)
Repeated Etoh Intoxication

- Normal = No Etoh
- Intoxication = Acute Etoh

\[ \text{GABA} \quad \text{NE Ach} \quad 5\text{HT Glu} \]

\[ \text{INHIBITORY (--) } \quad \text{EXCITATORY (+)} \]

Inhibition (-) = Excitation (+)

\[ \text{Etoh} \quad \text{GABA} \quad \text{NE Ach} \quad 5\text{HT Glu} \]

\[ \text{INHIBITORY (--) } \quad \text{EXCITATORY (+)} \]

Inhibition (-) > Excitation (+)

Tolerance

Tolerance = Chronic Etoh
New Equilibrium - Neuroadaptation

\[ \text{Etoh} \quad \text{GABA} \quad \text{NE Ach} \quad 5\text{HT Glu} \]

\[ \text{INHIBITORY (--) } \quad \text{EXCITATORY (+)} \]

Inhibition (-) = Excitation (+)
Tolerance

• The absence of obvious signs of complications is not evidence of the absence of complications.

CNS Equilibrium

Inhibitory (-) Tone = Excitatory (+) Tone

GABA  NE  Ach
INHIBITORY (-)  5HT  Glu
EXCITATORY (+)

4/20/2009  Alan Wartenberg MD - Used with Permission
Etoh Intoxication

- Normal = No Etoh
  - Inhibition (-) = Excitation (+)

- Intoxication = Acute Etoh
  - Inhibition (-) > Excitation (+)

Tolerance ➔ Withdrawal

- Tolerance = Chronic Etoh
  - Inhibition (-) = Excitation (+)

- Withdrawal = No Etoh
  - Inhibition (-) << Excitation (+)
Treatment - Withdrawal

Treatment = Benzodiazepine

Withdrawal = No Etoh

**Inhibition (-) = Excitation (+)**

4/29/2009  Alan Wartenberg MD - Used with Permission

Medical Treatment

“We are modulators of dysregulated neuronal reregulation”

Alan Wartenberg MD
Prediction of Addiction Risk

- Patient History of Use and Loss of Control
- Family History - Adoption Studies, Twin Studies
- Intensity of Response to Alcohol – MA Shuckit MD

Genetic Influences on Alcoholism Risk

- Two strategies to determine the relative contributions of genes and shared environment - twin and adoption studies
- Copenhagen Study - Goodwin et. Al.
- Adoption – Cross Fostering (Cloninger 1981, 1996)
- Twins (Cloninger 1998)
- Biological Paternal Half Siblings
- Genes \( \rightarrow \) 40 - 60 % of the Risk of Addiction, 
  \( \sim \) 60% for Alcoholism
Intensity of Response to Alcohol

- San Diego Prospective Study –
  - N = 297 men aged 18-25,
  - evaluate for AUD at 10-, 15-, 20-, 25-, 35-year follow-up, age 20→55
- Low Response = “hold my liquor” or “drink the others under the table”
  - LR’s need more alcohol to get an effect, therefore drink more at each sitting
  - LR’s choose heavy drinking peers, which helps them believe that what they drink and what they expect to happen in a drinking evening are normal ‘everybody gets drunk all the time, it’s what they do

- Response to Alcohol is genetically influenced
- Low Responders (LR) at greater risk for AUD

Trim RS, Shuckit MA & Smith TL (2009). The relationships of the level of response to alcohol and additional characteristics to alcohol use disorders across adulthood: a discrete-time survival analysis. Alcoholism: Clinical and Experimental Research (ACER) 33(9): 1562→1570

Neurobiology of Addiction

“Addiction is a cycle of spiraling dysregulation of brain reward systems that progressively increases, resulting in compulsive drug use and a loss of control over drug taking”

George F. Koob PhD
Professor and Chair, Committee on the Neurobiology of Addictive Disorders,
Scripps Research Institute; Adjunct Professor of Psychology and Psychiatry, UCSD


Neural circuitry of reward

- Present in all animals
- Produces pleasure for behaviors needed for survival:
  - Eating
  - Drinking
  - Sex
  - Nurturing
All drugs of abuse bind to the neural circuitry of reward

Stages of the Addiction Cycle: Intoxication ➔ Withdrawal/(-) Affect ➔ Preoccupation/Anticipation

Stages of Addiction

- Binge and Intoxication
  - Use $\rightarrow$ DA Release $\rightarrow$ Learning and Conditioning
  - Repeated Use $\rightarrow$ ↓ DA to Natural Rewards and ↑ Cues
  - Further Use $\rightarrow$ ↓ DA to Natural Rewards and Drug
- Withdrawal and Negative Affect
- Preoccupation and Anticipation

Volkow, Koob, McLellan “Neurobiologic Advances from the Brain Disease Model of Addiction” NEJM 1/28/16
Stages of Addiction

<table>
<thead>
<tr>
<th>Stage of Addiction</th>
<th>Binge Intoxication</th>
<th>Withdrawal Negative Affect</th>
<th>Preoccupation-Anticipation</th>
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</thead>
<tbody>
<tr>
<td>Initial Use</td>
<td>Feel Euphoric</td>
<td>Reduced Energy</td>
<td>Looking Forward</td>
</tr>
<tr>
<td>Continued Use</td>
<td>Feel Good</td>
<td>Reduced Excitement</td>
<td>Desiring Drug</td>
</tr>
<tr>
<td>Chronic Use</td>
<td>Escape Dysphoria</td>
<td>Depressed, Anxious</td>
<td>Obsessing/Planning</td>
</tr>
<tr>
<td>Neuroadaptation</td>
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</tbody>
</table>

Results in behavior change related to disruption of the Dopamine and Glutamate Systems and Stress Control Systems affected by CRF and Dynorphin

Drug Hijacks the Brain Reward and Motivational System -
Healthful Rewards lose their motivational power
Reward Systems become focused through conditioning on DA release by cues
But DA release to both drug and natural rewards decreases and Reactivity to Stress increases and Negative Emotions Emerge - ‘Anti-reward System’

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Volkow, Koob, McLellan “Neurobiologic Advances from the Brain Disease Model of Addiction” NEJM 1/28/16
Overview

• Common
  – NIMH: Depression afflicts 6.7% of US adults ≥ 18
    • Archives of General Psychiatry. 2005 Jun; 62(6): 617-27
  – Lifetime Prevalence – 20-26% women 8-12% men
    • Journal of the American Medical Association, 1996
  – Lifetime Prevalence – Anxiety (28.9%) Impulse (24.8%)
    Mood (20.8%) SUD (14.6%) Any Psychiatric D/O (50%)
• WHO: Depression = 2<sup>nd</sup> leading cause of disability
• 80% get no Treatment at all - 24% PCP 20% Non-MD 12% Psych
• Age of Onset:
  – 50% of all mental d/o occur by age 14, 75% by age 24.
  – Anxiety (11) Borderline D/O (18?) SUD (20) Bipolar Disorder (25 – Sx 14)
    Depression (30
    • Arch Gen Psychiatry. 2005 Jun;62(6):593-602.

Physician’s Comfort with AUD

• National Center on Addiction & Substance Abuse (CASA)
• Most MD’s feel “very prepared” to identify:
  • hypertension (83%)
  • diabetes (82%)
  • depression (44.1%).
• < 20% of MD’s feel “very prepared” to diagnose AUD.
• Most MD’s feel treatment is “very effective” for:
  • hypertension (85.7%),
  • diabetes (69%),
  • depression (42.5%),
• But few feel treatment is “very effective” for alcoholism (3.6%)

Adolescents - CRAFFT

1. Have you ever ridden in a CAR driven by someone (including yourself) who was high or had been using alcohol or drugs?
2. Do you ever use alcohol or drugs to RELAX, feel better about yourself, or fit in?
3. Do you ever use alcohol or drugs while you are by yourself, ALONE?
4. Do you ever FORGET things you did while using alcohol or drugs?
5. Do your family or FRIENDS ever tell you that you should cut down on your drinking or drug use?
6. Have you ever gotten into TROUBLE while you were using alcohol or drugs?


CRAFFT

- Score of 2 or more “yes” is positive and highly correlated with having a substance-related problem needing substance abuse treatment.
- Cut point score of 1 correlates with problem use
- Adolescents prefer paper self-report or computer to clinician interview in medical settings (Knight et al 2007)
- 15% screen + for at least problematic use
- Monitoring the Future Survey: 1 in 10 8th graders and 1 in 5 10th graders had binge drinking in past 2 wks; not gender specific; having friends who get drunk was strongest predictor, also other substance use highly correlated (Patrick and Schulenberg 2010)
Adults - AUDIT

Alcohol Use Disorders Identification Test - WHO 10 Questions

AUDIT - C - 3 Questions

Q#1: How often did you have a drink containing alcohol in the past year?
- Never (0 points)
- Monthly or less (1 point)
- Two to four times a month (2 points)
- Two to three times per week (3 points)
- Four or more times a week (4 points)

Q#2: How many drinks did you have on a typical day when you were drinking in the past year?
- 1 or 2 (0 points)
- 3 or 4 (1 point)
- 5 or 6 (2 points)
- 7 to 9 (3 points)
- 10 or more (4 points)

Q#3: How often did you have six or more drinks on one occasion in the past year?
- Never (0 points)
- Less than monthly (1 point)
- Monthly (2 points)
- Weekly (3 points)
- Daily or almost daily (4 points)

Positive Screen: Men > 4 Women > 3

Access to Treatment

- AMA – from 1995→2013
  - US Population increased by 37% - 267 M → 317 M
  - and ACA gave access to Health Insurance for millions
  - US MD’s increased by 45%, according to AHRQ in 2010 there were
    - 624,434 MD’s spend the majority of their time in direct patient care
    - 209,000 are PCP
  - but US psychiatrists ↑ by only 12% - and 59% are 55 or older

- Solutions??
  - ↑ Collaborative Care
  - Telepsychiatry
  - Computer Based Therapy

- But all assume PCP’s ↑ their knowledge and ability to treat → ‘practice to the ceiling of their expertise.’
  - Sita Diehl, Director of State Policy and Advocacy - National Alliance on Mental Illness

- ↑PCP Expertise - Especially for Depression, Anxiety and Alcoholism
## Medication Assisted Treatment - MAT

<table>
<thead>
<tr>
<th>Agent</th>
<th>FDA?</th>
<th>Dose</th>
<th>Mechanism</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disulfiram</td>
<td>1954</td>
<td>250 - 500</td>
<td>ADH Inhibitor</td>
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<tr>
<td>Naltrexone</td>
<td>1994</td>
<td></td>
<td>µ Opioid (+)</td>
</tr>
<tr>
<td>SR-Naltrexone</td>
<td>2004</td>
<td>380 IM Q 28</td>
<td>µ Opioid (-)</td>
</tr>
<tr>
<td>Acamprosate</td>
<td>2004</td>
<td>333 Tab ➔ 2 BID</td>
<td>GABA (+)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>NMDA (-)</td>
</tr>
<tr>
<td>Topiramate</td>
<td>NIAAA</td>
<td></td>
<td>?</td>
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<tr>
<td>Gabapentin</td>
<td>-</td>
<td>1800 &gt; 900</td>
<td>GABA (+)</td>
</tr>
<tr>
<td>Baclofen</td>
<td>-</td>
<td>40 - 80 BID?</td>
<td>GABA-B (+)</td>
</tr>
</tbody>
</table>

Robust Individual Responses but High Rates of Non-Response
Treatment - Psychotherapy

• > 100 Evidence Based Psychotherapies for SUD
• CBT
• 12 Step Facilitation

Treatment - AA

• Effective
  – “compulsory hospitalization with AA follow-up addressed drinking problems significantly more effectively than did compulsory AA alone.”
• Alcoholics Anonymous and other 12-step programmes for alcohol dependence.
  Marica Ferri, Laura Amato, Marina Davoli First published: 19 July 2006 Assessed as up-to-date: 19 March 2006 Editorial Group: Cochrane Drugs and Alcohol Group
  – AA and 12-step treatment was shown to be as effective as anything else to which it was compared.
• Available - www.aa.org
• Free

http://www.mghclaycenter.org/parenting-concerns/families/myths-12-step-program-science-tells-us-effective-treatment-addiction/
Treatment - SMART Recovery

Epilogue
"First you take a drink, then the drink takes a drink, then the drink takes you."

— F. Scott Fitzgerald (1896-1940).

“It’s a great advantage not to drink among hard drinking people.”

— F. Scott Fitzgerald, The Great Gatsby
"Any man who eats dessert is not drinking enough."
— Ernest Hemingway.

"Write drunk, edit sober."
— Ernest Hemingway.

"An intelligent man is sometimes forced to be drunk to spend time with his fools."
— Ernest Hemingway, For Whom the Bell Tolls.

Earnest Hemingway

• The Sun Also Rises - 1926
• A Farewell to Arms - 1929
• To Have and Have Not - 1937
• For Whom the Bell Tolls - 1940
• Across the River and into the Trees - 1950
• The Old Man and the Sea - 1952
• The Snows of Kilimanjaro - 1961
• A Moveable Feast - 1964 (Posthumous)
F. Scott Fitzgerald

• This Side of Paradise - 1920
• "The Curious Case of Benjamin Button" - 1921
• Flappers and Philosophers - 1921
• The Beautiful and Damned - 1922
• Tales of the Jazz Age - 1922
• The Great Gatsby - 1925
• Tender Is the Night - 1934
• The Love of the Last Tycoon - 1941 (Posthumous)
Selected References

- **A Moveable Feast** - Earnest Hemingway 1964 (Posthumous)
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