

# **NEW DEVELOPMENTS IN RECREATIONAL DRUGS**



**POLAT DURUKAN, MD, PROF**

**Erciyes University Faculty of Medicine, Department of Emergency Medicine**

**Kayseri, Turkey**

**Emergency Physicians Association of Turkey (EPAT)**



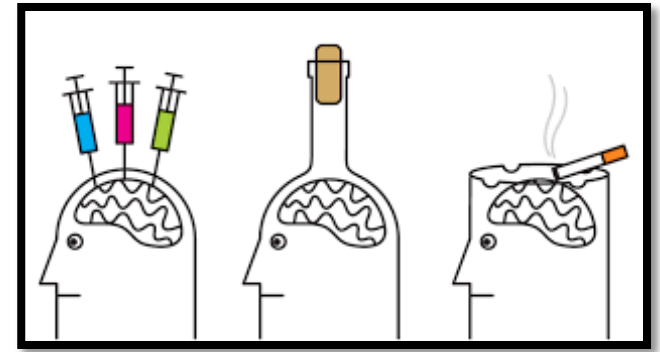
# What is a drug?



- “a substance used in medication or in the preparation of medication”
- “something and often an illegal substance that causes addiction, habituation, or a marked change in consciousness”
- “*Pharmacology*. a chemical substance used in the treatment, cure, prevention, or diagnosis of disease or used to otherwise enhance physical or mental well-being”

-Merriam Webster Online

# Why is Addiction a Problem?



- Rates of alcohol, tobacco and other drug use begin early and increase through the mid 20's
- Early use increases the risk of addiction
- Consequences of alcohol, tobacco and drug use are great
- Addiction affects all strata of society
- Costs of addiction are high including death, lost productivity, costs to society and families

# „Fourth drive“ (Ronald K. Siegel)

- Satisfaction of hunger, thirst
- Need for safety (shelter)
- Sexual drive
- ? „Altered-mind“ states ?



- Thirst for new impressions, sensations, feeling, emotions, experiences – ways of satisfaction?

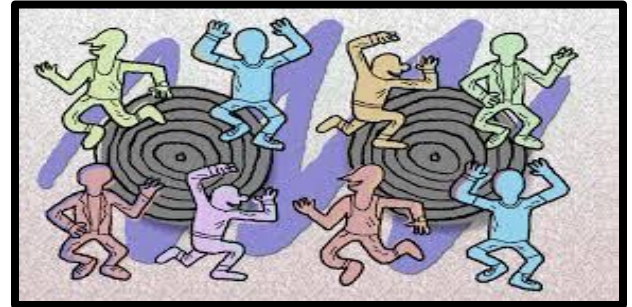
# Recreational drug use

- Why? (Intention) – creating/enhancing recreational experience
- Where,when? – night clubs („party drugs“), psychonautics, spiritual communities, sport, army, sex...
- Problems:
  - Legality?
  - Addiction
  - Tolerance
  - Physical dependence
  - Neurotoxicity
  - General toxicity



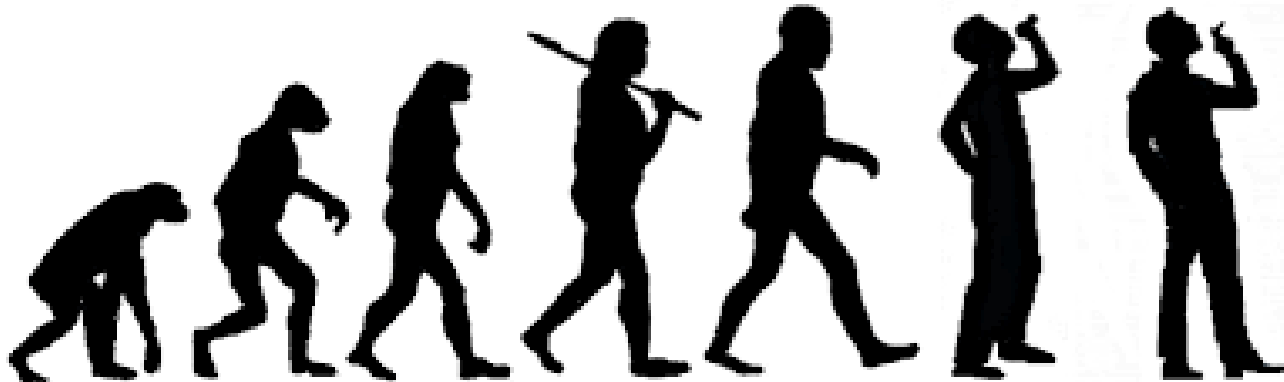
# Novel Recreational Drugs of Abuse („Legal Highs“)

- New synthesized chemicals, not listed in Convention on psychotropic substances, sold by internet (websites with „legal highs“)
- Psychoactive plants
- „clubbers drugs“ – use 40% of night clubs visitors
- Each 2-3 months new „Legal High“ is marketed (absence of studies about toxicity, biometabolism, no lab methods of identification in human liquids)



# Novel Recreational Drugs of Abuse

- Production in Southeast Asia, China; packaging and distribution in Europe and USA
- Simple synthesis schemes (2-3 chemical reactions, common reagents (toluene, acetone...), high grade of chemical purity, low prices
- Chemical structure is similar to the structure of forbidden „classical“ psychoactive substances



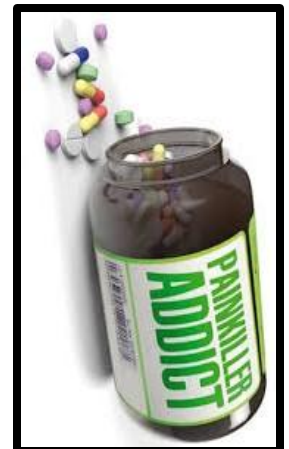
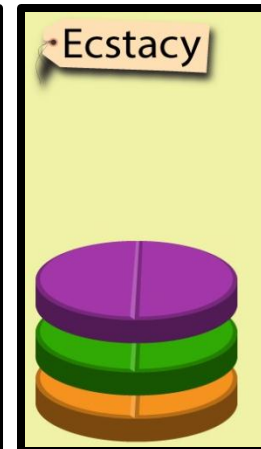
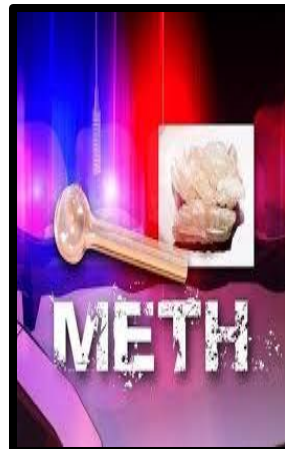
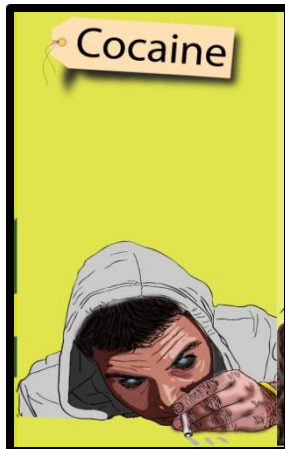


AGM  
2016



# Commonly Abused Controlled Substances

- Marijuana
- Cocaine
- Methamphetamine (Speed)
- Heroin
- Hallucinogens – Ecstasy (MDMA), LSD (Acid), Mushrooms
- Painkillers and Other Prescribed Drugs





# Prevalence



<u>Drug</u>	<u>Past Year</u>	<u>Last 30 Days</u>
<b>Marijuana</b>	46.2%	15.7%
<b>Cocaine</b>	3.6%	1.2%
<b>Amphetamines</b>	3.6%	1.5%
<b>Heroin</b>	.34%	.10%
<b>LSD</b>	3.7%	.95%
<b>MDMA</b>	4.7% - 24%	

47% reported have used marijuana at least once



**Marijuana** is a green, brown, or gray mixture of dried, shredded leaves, stems, seeds, and flowers of the hemp plant. Also known as pot, herb, grass, weed, boom, Mary Jane, gangster, reefer, blunt, or chronic and some 200 others.



# Marijuana –Effects & Consequences

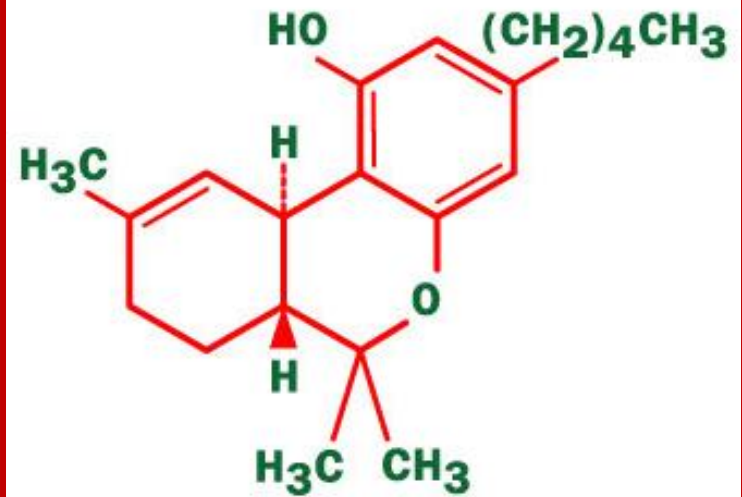
- Sedation, Euphoria, Mild Perceptual Disturbance, Anxiety/Panic, Increase Appetite
- Dependence
  - Physiological = No
  - Tolerance = No
  - Withdrawal = Equivocal
  - Abused = Yes
- Health Hazards – Injury, Exacerbates Psychosis, Respiratory/Cancer??????
- Medical Uses – Cancer Tx, AIDS, MS





# Marijuana

- Derived from Cannabis sativa
- Smoked or ingested. Has recently appeared in cigars called blunts and spliffs
- Active chemical is THC (delta-9-tetrahydrocannabinol)



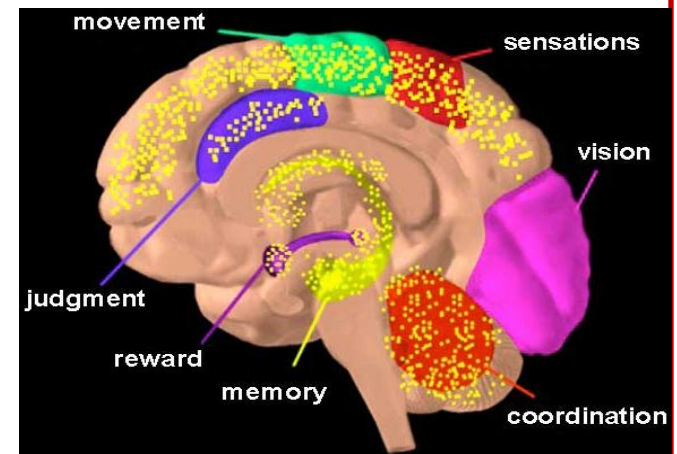
**The Molecular Structure of THC  
(delta-9-tetrahydrocannabinol)**

©2001 HowStuffWorks



# Marijuana and the brain

- THC mimics anandamide, a neurotransmitter that activates cannabinoid receptors
- Cannabinoid receptors are concentrated in the hippocampus, cerebellum, and basal ganglia
- THC's effects on the...
  - Hippocampus-impaired short-term memory
  - Cerebellum and basal ganglia-coordination



# Marijuana-Other factors to consider

- Harmful effects
  - Smoking marijuana produces many of the health problems related to smoking tobacco
  - Marijuana may be physically addictive and users may experience withdrawal symptoms that affect mood, appetite, and sleep patterns
- Potential Medicinal Uses
  - Suppresses nausea and increases appetite
  - Relieves eye pressure
  - Decreases muscle spasms, convulsions, menstrual cramps

# Marijuana-cultural attitudes

- Positive
  - Makes people happy/mellow
  - Enhances creativity
- Negative
  - Causes paranoia/violence and leads to depraved behavior (Reefer Madness)
  - Leads to laziness and apathy



# Cocaine

- Derived from the leaves of Erhthroxylon coca bush
- Pure chemical is cocaine hydrochloride salt that is snorted or dissolved in water and injected
- Crack is cocaine that has not been neutralized by an acid and is usually heated and smoked



# Cocaine and the brain

- Cocaine inhibits reabsorption of dopamine, which gives the user a feeling of euphoria
- Cocaine is highly addictive
- Users develop a tolerance to the high of cocaine, but a sensitivity to its anesthetic and convulsant effects
- Heavy cocaine use can cause paranoid psychosis



# Others of uses of cocaine

- Coca leaves chewed in precolumbian South America, used as stimulant
- Cocaine used as stimulant in tonics in early 20<sup>th</sup> century
- Still used as anesthetic during some surgeries



# Methamphetamine (Speed)



- Powerful stimulant
  - Raises body temperature
  - Increases wakefulness and decreases appetite
- Highly addictive
  - Users develop tolerance
  - Psychological withdrawal symptoms
- High comes from release of dopamine into brain's pleasure centers
- Release of dopamine damages dopamine and serotonin-containing cells



# Methamphetamine-Medical Uses

- Narcolepsy
- Attention deficit disorder-ADD
- Obesity



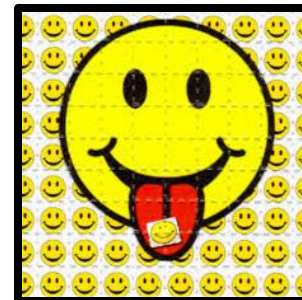


# Stimulants and Society

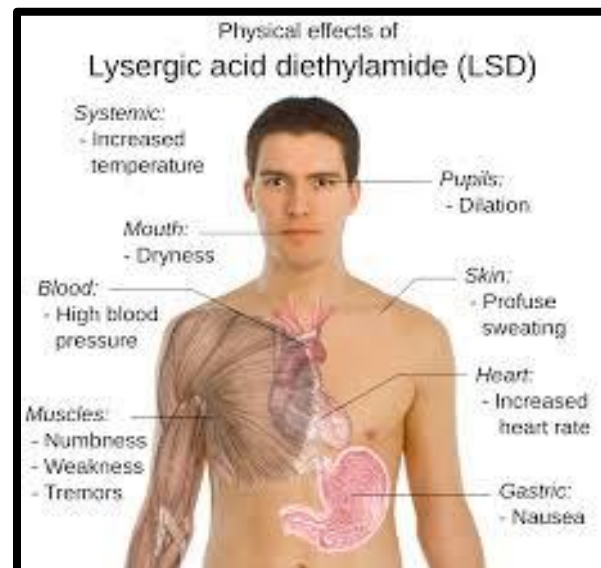
- Adderall (amphetamine-dextroamphetamine)
  - Habit-forming and overdose can be fatal
  - Used to treat narcolepsy and ADHD
  - Also used recreationally as a “party drug”
- Caffeine
  - Too much can impair heart function, disrupt sleep, and cause headaches
  - Heavy users experience withdrawal symptoms
  - May improve memory retention in older women by reducing Alzheimer’s-causing beta amyloid protein



# LSD (Acid)



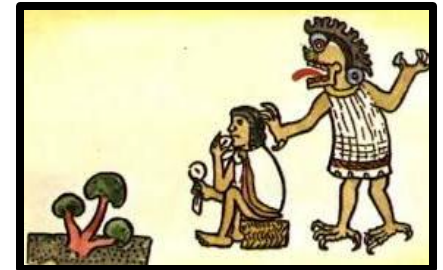
- Compound of lysergic acid
- Experience varies based on user and setting
- User may experience synesthesia, delusions, and hallucinations
- May lead to schizophrenia or severe depression
- Flashbacks-recurrence of “trip” experience after use of LSD has ceased
- Not addictive, but users develop a tolerance
- No known medical uses





# Other Hallucinogens

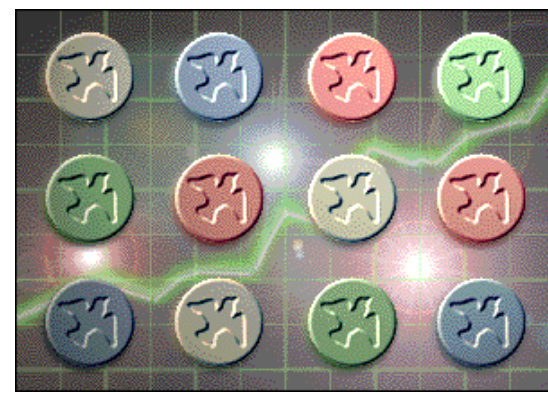
- Mushrooms-Psilocybin
- Mescaline
- Peyote
- Nutmeg?



- Some Hallucinogens are used in Religious Rituals. Should this be stopped?



# MDMA (Ecstasy)

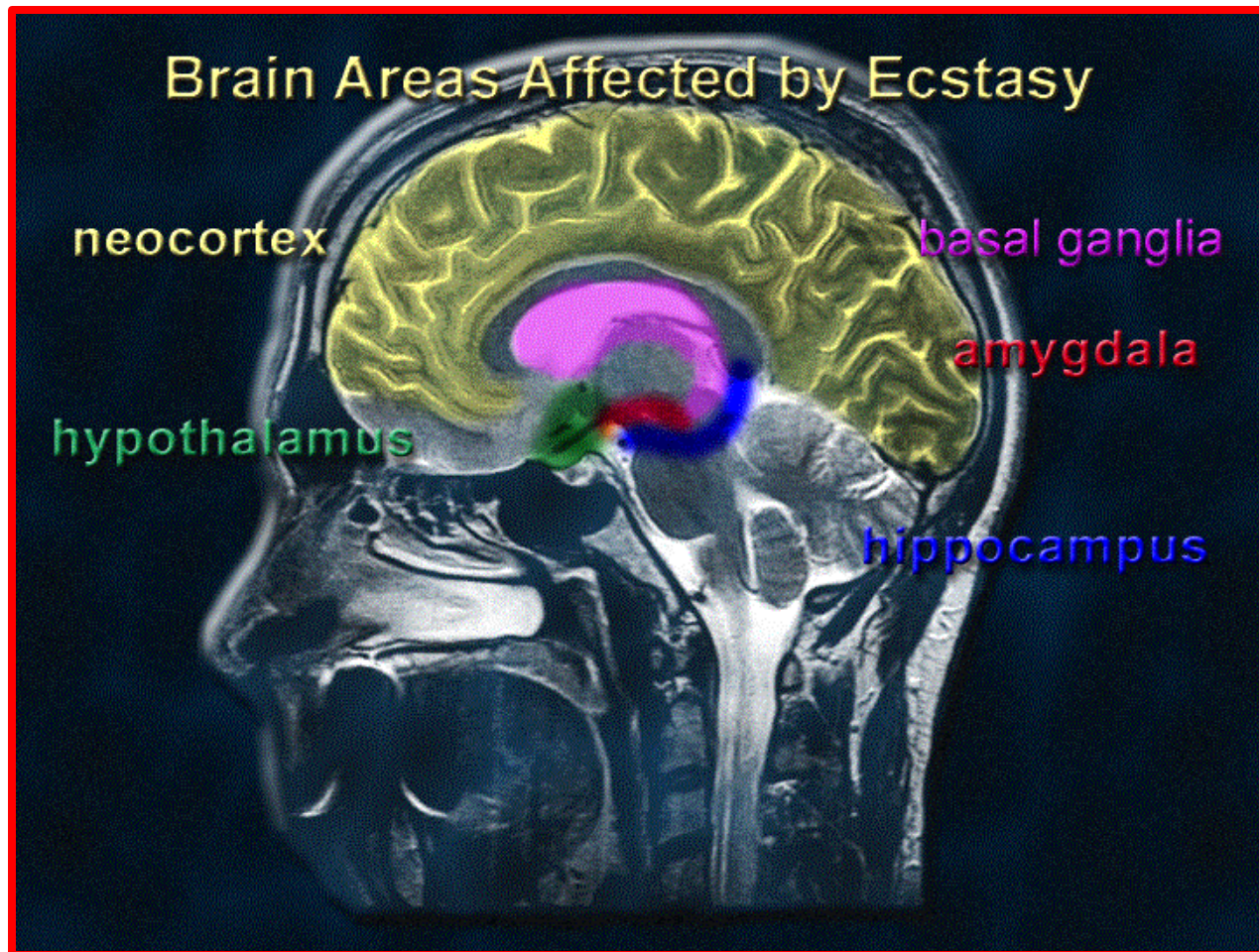
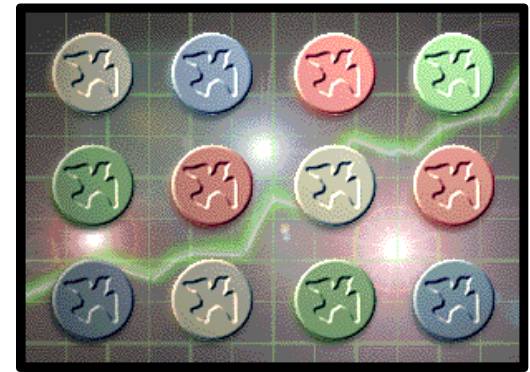


- 3,4-methylenedioxymethamphetamine
- Similar to methamphetamine and mescaline
- Has stimulant and hallucinogenic properties
- Inhibition, euphoria, enhanced sensation, especially tactile
- Same physical dangers as stimulants
- Can cause depression and inability to concentrate
- Damages neurons involved in mood (serotonin), thinking, and judgement
- Often mixed with other stimulants, such as caffeine



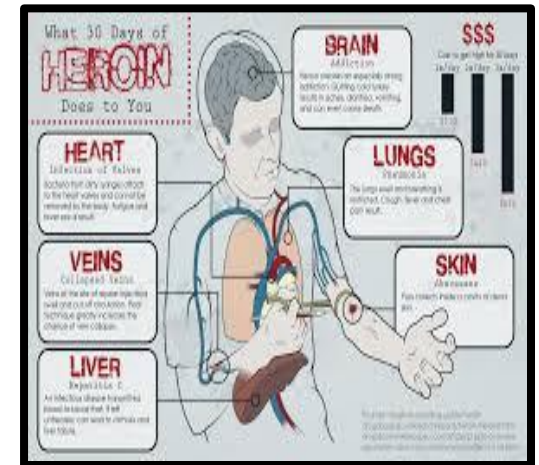


# MDMA (Ecstasy)





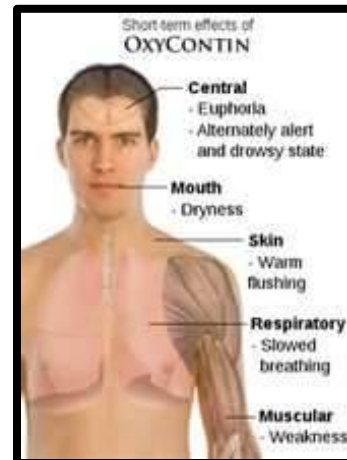
- Opiate extracted from morphine of poppy seed pods
- Used as a painkiller around the turn of the century
- Often mixed with other substances, so strength is variable
- Euphoria
- Highly addictive-tolerance develops
- Extremely toxic to the body, and additives may be even worse
- Causes respiratory depression
- Withdrawal symptoms are potentially fatal for heavy users





# Prescription Painkillers

- OxyContin
  - Active ingredient is oxycodone, a narcotic analgesic
  - Closely related to heroin, with similar side effects
  - 10 mg of oxycodone=10 mg morphine
  - Respiratory depression can be fatal
  - Tolerance and withdrawal symptoms occur
  - When taken as directed, it helps users to manage pain
  - Methadone medication therapy has been used as an opiate addiction treatment for over five decades



# Prescription Painkillers

## Hydrocodone

- Analgesic and antitussive
- Structurally similar to codeine but with effects similar to morphine
- Often mixed with acetaminophen (tylenol)
  - Vicoden
  - Lortab
  - Lorcet
- Overdose causes potentially fatal liver damage due to acetaminophen
- Users experience dependence and withdrawal symptoms



# Acetaminophen (Tylenol)

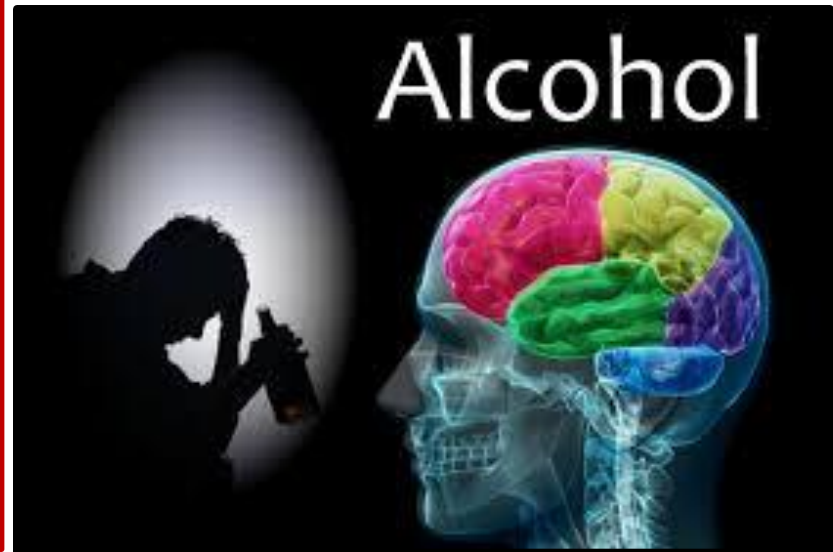
- Potentially fatal if abused
- The leading cause of liver failure
  - At least 42% of cases at liver centers
  - About 50% unintentional, 50% suicide
- Available almost in all markets
- Aspirin and ibuprophen (Advil) are also dangerous at high doses, causing bleeding and ulcers





# Alcohol

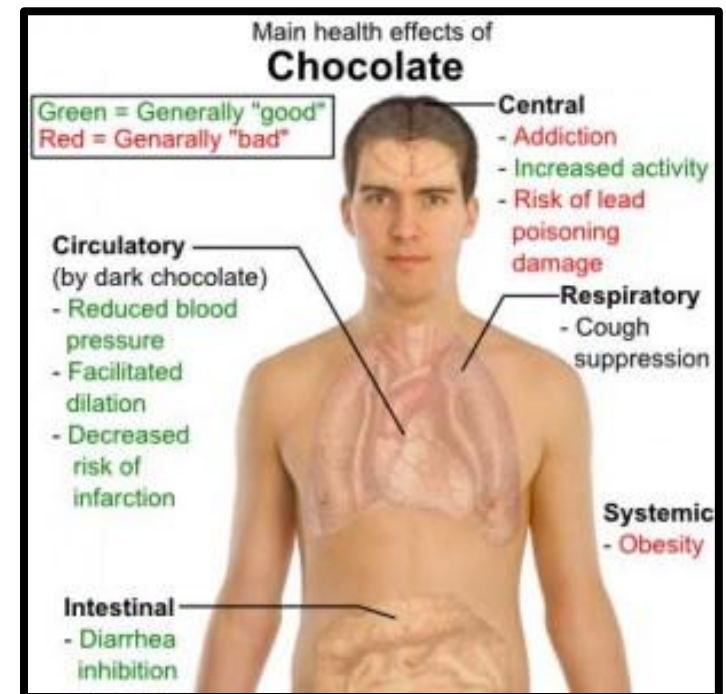
- Short-term effects
  - Blackouts and Memory Lapses
  - Impaired judgement, coordination, reaction time
  - Alcohol poisoning
- Long-term effects
  - Brain damage
    - Brain shrinkage in alcoholics
    - May be caused by alcohol directly or indirectly
    - Wernicke-Korsakoff Syndrome
  - Liver damage







- Users may experience cravings
- May affect mood
- Contains cannabinoid-like fatty acids and may mimic effects of marijuana



# Bonzai

- Example of new generation synthetic recreational drugs
- Bonzai, Spice, K2...
- Whatever the name, they took the main place in this market





# The Ethics of Recreational Drug Use



- Are there any desirable side effects of drugs? Do these ever “outweigh” the bad effects?
- Prescription drugs
  - Does a doctor know best?
  - Potential for abuse
- Illegal Drugs, Law Enforcement (DEA), and Drug Traffickers
- Targeting Demographics
- Impaired Mental Capacity
  - Okay in some settings?
  - Potential for overdose
- Legalization of Drugs
  - Should certain drugs be legalized? Which ones? Why?
  - Should legal drugs be made illegal?
  - Would legalizing drugs solve any problems?
  - Does the government have a say in what I put into my own body?



# In Sum



- Everyone has a relationship w/ETOH & Drugs
- That relationship can be non-use, use, misuse, abuse or dependence
- The line can be difficult if not impossible for some drugs because of the DRUG
- The line can be difficult if not impossible for some drugs because of the PERSON

# THANK YOU FOR YOUR ATTENTION

