

## Substance Related Disorders

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## Substance Classes

- Alcohol
- Caffeine
- Cannabis
- Hallucinogens
  - PCP
  - others
- Inhalants
- Opioids
- Sedatives, hypnotics, and anxiolytics
- Stimulants
- Tobacco
- Other

Gambling

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## Substance Use Disorder

- Using larger amounts or for longer time than intended
- Persistent desire or unsuccessful attempts to cut down or control use
- Great deal of time obtaining, using, or recovering
- Craving
- Fail to fulfill major roles (work, school, home)
- Persistent social or interpersonal problems caused by substance use

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## Substance Use Disorder

- Important social, occupational, recreational activities given up or reduced
- Use in physically hazardous situations
- Use despite physical or psychological problems caused by use
- Tolerance
- Withdrawal (not documented after repeated use of PCP, inhalants, hallucinogens)

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## Substance-Induced

- Intoxication
- Withdrawal
- Psychotic Disorder
- Bipolar Disorder
- Depressive Disorder
- Anxiety Disorder
- Sleep Disorder
- Delirium
- Neurocognitive
- Sexual Dysfunction

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## Intoxication

- Reversible substance-specific syndrome due to recent ingestion of a substance
- Behavioral/psychological changes due to effects on CNS developing after ingestion:
  - ex. Disturbances of perception, wakefulness, attention, thinking, judgement, psychomotor behavior and interpersonal behavior
- Not due to another medical condition or mental disorder
- Does not apply to tobacco

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## Tolerance

- Need to use an increased amount of a substance in order to achieve the desired effect
- OR
- Markedly diminished effect with continued use of the same amount of the substance

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## ER Visits (NIDA '09)

- 1.2M: non-medical use of pharmaceuticals
- 660K: alcohol
- 425K: cocaine
- 380K: marijuana
- 210K: heroin
- 93K: stimulants



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## Comorbidity

- Up to 50% of addicts have comorbid psychiatric disorder
  - Antisocial PD
  - Depression
  - Suicide



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## Alcohol



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## ALCOHOL- CNS depressant

- **Intoxication**
  - Blood Alcohol Level - 0.08g/dl
  - Progress from mood lability, impaired judgment, and poor coordination to increasing level of neurologic impairment (severe dysarthria, amnesia, ataxia, obtundation)
- Can be fatal (loss of airway protective reflexes; pulmonary aspiration, profound CNS depression)



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## Alcohol Withdrawal

- **Early**
  - anxiety, irritability, tremor, HA, insomnia, nausea, tachycardia, HTN, hyperthermia, hyperactive reflexes
- **Seizures**
  - generally seen 24-48 hours
  - most often Grand mal
- **Withdrawal Delirium (DTs)**
  - generally between 48-72 hours
  - altered mental status, hallucinations, marked autonomic instability
  - life-threatening



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## Alcohol Withdrawal (cont.)

- CIWA (Clinical Institute Withdrawal Assessment for Alcohol)
- Assigns numerical values to orientation, N/V, tremor, sweating, anxiety, agitation, tactile/auditory/ visual disturbances and HA. VS checked but not recorded. Total score of > 10 indicates more severe withdrawal
- Based on severity of withdrawal or history of previous withdrawal seizures or DTs, med therapy can be scheduled or symptom-triggered

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## Alcohol Withdrawal (cont.)

- **Benzodiazepines**
  - GABA agonist - cross-tolerant with alcohol
  - reduce risk of SZ; provide comfort/sedation
- **Anticonvulsants**
  - reduce risk of SZ and may reduce kindling
  - helpful for protracted withdrawal
  - Carbamazepine or Valproic acid
- **Thiamine supplementation**
  - Risk thiamine deficiency (Wernicke/Korsakoff)

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## Alcohol treatment

- **Outpatient CD treatment:**
  - support, education, skills training, psychiatric and psychological treatment, AA
- **Medications:**
  - Disulfiram
  - Naltrexone
  - Acamprostate



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## Medications - ETOH Use Disorder

- **Disulfiram (antabuse) 250mg-500mg po daily**
  - Inhibits aldehyde dehydrogenase and dopamine beta hydroxylase
  - Aversive reaction when alcohol ingested - vasodilatation, flushing, N/V, hypotension/ HTN, coma / death
  - Hepatotoxicity - check LFTs and h/o hep C
  - Neurologic with polyneuropathy / paresthesias that slowly increase over time and increased risk with higher doses
  - Psychiatric side effects - psychosis, depression, confusion, anxiety
  - Dermatologic rashes and itching
  - Watch out for disguised forms of alcohol - cologne, sauces, mouth wash, OTC cough meds, alcohol based hand sanitizers, etc

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## Medications - ETOH Use Disorder

- **Naltrexone 50mg po daily**
  - Opioid antagonist thought to block mu receptors reducing intoxication euphoria and cravings
  - Hepatotoxicity at high doses so check LFT's
- **Acamprostate(Campral) 666mg po tid**
  - Unknown MOA but thought to stabilize neuron excitation and inhibition - may interact with GABA and Glutamate receptor - cleared renally (check kidney function)

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## Benzodiazepine( BZD)/ Barbiturates




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## Benzodiazepine( BZD)/ Barbiturates

- **Intoxication**
  - similar to alcohol but less cognitive/motor impairment
  - variable rate of absorption (lipophilia) and onset of action and duration in CNS
  - the more lipophilic and shorter the duration of action, the more "addicting" they can be
  - all can be addicting

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## Benzodiazepine

- **Withdrawal**
  - Similar to alcohol with anxiety, irritability, insomnia, fatigue, HA, tremor, sweating, poor concentration - time frame depends on half life
  - Common detox mistake is tapering too fast; symptoms worse at end of taper
  - Convert short elimination BZD to longer elimination half life drug and then slowly taper
  - Outpatient taper- decrease dose every 1-2 weeks and not more than 5 mg Diazepam dose equivalent
    - 5 diazepam = 0.5 alprazolam = 25 clonazepam = 0.25 lorazepam = 1 lorazepam
  - May consider carbamazepine or valproic acid especially if doing rapid taper

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## Benzodiazepines

- Alprazolam (Xanax) t 1/2 6-20 hrs
  - Oxazepam (Serax) t 1/2 8-12 hrs
  - Temazepam (Restoril) t 1/2 8-20 hrs
  - Clonazepam (Klonopin) t 1/2 18-50 hrs
  - Lorazepam (Ativan) t 1/2 10-20 hrs
  - Chlordiazepoxide (Librium) t 1/2 30-100 hrs (less lipophilic)
  - Diazepam (Valium) t 1/2 30-100 hrs (more lipophilic)
- \*Oxazepam, Temazepam & Lorazepam- metabolized through only glucuronidation in liver and not affected by age/ hepatic insufficiency.

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## Opioids



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## OPIOIDS

Bind to the mu receptors in the CNS to modulate pain

- **Intoxication**- pinpoint pupils, sedation, constipation, bradycardia, hypotension and decreased respiratory rate
- **Withdrawal**- not life threatening unless severe medical illness but extremely uncomfortable. s/s dilated pupils, lacrimation, goosebumps, n/v, diarrhea, myalgias, arthralgias, dysphoria or agitation
- **Rx**- symptomatically with antiemetic, antacid, antidiarrheal, muscle relaxant (methocarbamol), NSAIDs, clonidine and maybe BZD
- **Neuroadaptation**: increased DA and decreased NE

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## Treatment - Opiate Use Disorder

- **CD treatment**
  - support, education, skills building, psychiatric and psychological treatment, NA
- **Medications**
  - Methadone (opioid substitution)
  - Naltrexone
  - Buprenorphine (opioid substitution)

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## Treatment - Opiate Use Disorder

- **Naltrexone**
  - Opioid blocker, mu antagonist
  - Start po daily
- **Methodone**
  - Mu agonist
  - Start at 20-40mg and titrate up until not craving or using illicit opioids
  - Average dose 80-100mg daily
  - Needs to be enrolled in a certified opiate substitution program
- **Buprenorphine**
  - Partial mu partial agonist with a ceiling effect
  - Any physician can Rx after taking certified ASAM course
  - Helpful for highly motivated people who do not need high doses



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## Stimulants



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## STIMULANTS

- **Intoxication (acute)**
  - psychological and physical signs
- euphoria, enhanced vigor, gregariousness, hyperactivity, restlessness, interpersonal sensitivity, anxiety, tension, anger, impaired judgment, paranoia
- tachycardia, papillary dilation, HTN, N/V, diaphoresis, chills, weight loss, chest pain, cardiac arrhythmias, confusion, seizures, coma

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## STIMULANTS (cont.)

- **Chronic intoxication**
  - affective blunting, fatigue, sadness, social withdrawal, hypotension, bradycardia, muscle weakness
- **Withdrawal**
  - not severe but have exhaustion with sleep (crash)
  - treat with rest and support

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## Cocaine

- Route: nasal, IV or smoked
- Has vasoconstrictive effects that may outlast use and increase risk for CVA and MI (obtain EKG)
- Can get rhabdomyolysis with compartment syndrome from hypermetabolic state
- Can see psychosis associated with intoxication that resolves
- **Neuroadaptation:** cocaine mainly prevents reuptake of DA

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## Treatment - Stimulant Use Disorder (cocaine)

- Treatment including support, education, skills, CA
- Pharmacotherapy
  - No medications FDA-approved for treatment
  - If medication used, also need a psychosocial treatment component

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## Amphetamines

- Similar intoxication syndrome to cocaine but usually longer
- Route - oral, IV, nasally, smoked
- No vasoconstrictive effect
- Chronic use results in neurotoxicity possibly from glutamate and axonal degeneration
- Can see permanent amphetamine psychosis with continued use
- Treatment similar as for cocaine but no known substances to reduce cravings
- **Neuroadaptation**
  - inhibit reuptake of DA, NE, SE - greatest effect on DA

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## Treatment – Stimulant Use Disorder (amphetamine)

- CD treatment: including support, education, skills, CA
- No specific medications have been found helpful in treatment although some early promising research using atypical antipsychotics (methamphetamine)

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## Tobacco



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## Tobacco

- Most important preventable cause of death / disease in USA
- 25%- current smokers, 25% ex smokers
- 20% of all US deaths
- 45% of smokers die of tobacco induced disorder
- Second hand smoke causes death / morbidity
- Psychiatric pts at risk for Nicotine dependence- 75%-90 % of Schizophrenia pts smoke

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## Tobacco (cont.)

- **Drug Interactions**
  - induces CYP1A2 - watch for interactions when start or stop (ex. Olanzapine)
- **No intoxication diagnosis**
  - initial use associated with dizziness, HA, nausea
- **Neuroadaptation**
  - nicotine acetylcholine receptors on DA neurons in ventral tegmental area release DA in nucleus accumbens
- **Tolerance**
  - rapid
- **Withdrawal**
  - dysphoria, irritability, anxiety, decreased concentration, insomnia, increased appetite

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## Treatment – Tobacco Use Disorder

- Cognitive Behavioral Therapy
- Agonist substitution therapy
  - nicotine gum or lozenge, transdermal patch, nasal spray
- Medication
  - bupropion (Zyban) 150mg po bid
  - varenicline (Chantix) 1mg po bid

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## Hallucinogens

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## HALLUCINOGENS

- Naturally occurring - Peyote cactus (mescaline); magic mushroom(Psilocybin) - oral
- Synthetic agents – LSD (lysergic acid diethylamide) - oral
- DMT (dimethyltryptamine) - smoked, snuffed, IV
- STP (2,5-dimethoxy-4-methylamphetamine) – oral
- MDMA (3,4-methyl-enedioxymethamphetamine) ecstasy – oral

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## MDMA (XTC or Ecstasy)

- Designer club drug
- Enhanced empathy, personal insight, euphoria, increased energy
- 3-6 hour duration
- **Intoxication-** Illusions, hyperacusis, sensitivity of touch, taste/ smell altered, "oneness with the world", tearfulness, euphoria, panic, paranoia, impairment judgment
- Tolerance develops quickly and unpleasant side effects with continued use (teeth grinding) so dependence less likely

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## MDMA (XTC or Ecstasy)cont.

- **Neuroadaptation-** affects serotonin (5HT), DA, NE but predominantly 5HT2 receptor agonists
- **Psychosis**
  - Hallucinations generally mild
  - Paranoid psychosis associated with chronic use
  - Serotonin neural injury associated with panic, anxiety, depression, flashbacks, psychosis, cognitive changes.
- **Withdrawal** – unclear syndrome (maybe similar to mild stimulants-sleepiness and depression due to 5HT depletion)

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## Cannabis

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## CANNABIS

- Most commonly used illicit drug in America
- THC levels reach peak 10-30 min, lipid soluble, long half life of 50 hours
- **Intoxication-**
  - Appetite and thirst increase
  - Colors/ sounds/ tastes are clearer
  - Increased confidence and euphoria
  - Relaxation
  - Increased libido
  - Transient depression, anxiety, paranoia
  - Tachycardia, dry mouth, conjunctival injection
  - Slowed reaction time/ motor speed
  - Impaired cognition
  - Psychosis

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## CANNABIS (cont.)

- **Neuroadaptation**
  - CB1, CB2 cannabinoid receptors in brain/ body
  - Coupled with G proteins and adenylate cyclase to CA channel inhibiting calcium influx
  - Neuromodulator effect; decrease uptake of GABA and DA
- **Withdrawal** - insomnia, irritability, anxiety, poor appetite, depression, physical discomfort

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## CANNABIS (cont.)

- **Treatment**
  - Detox and rehab
  - Behavioral model
  - No pharmacological treatment but may treat other psychiatric symptoms

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## PCP

PCP in both crystalline form and a solid in PCP dissolved in water

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## PHENACYCLIDINE (PCP) "Angel Dust"

- Dissociative anesthetic
- Similar to Ketamine used in anesthesia
- **Intoxication:** severe dissociative reactions – paranoid delusions, hallucinations, can become very agitated/violent with decreased awareness of pain.
- Cerebellar symptoms - ataxia, dysarthria, nystagmus (vertical and horizontal)
- With severe OD - mute, catatonic, muscle rigidity, HTN, hyperthermia, rhabdomyolysis, seizures, coma and death

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## PCP cont.

- **Treatment**
  - antipsychotic drugs or BZD if required
  - Low stimulation environment
  - acidify urine if severe toxicity/coma
- **Neuroadaptation**
  - opiate receptor effects
  - allosteric modulator of glutamate NMDA receptor
- **No tolerance or withdrawal**

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## Treatment

- Behavioral Interventions (target internal and external reinforcers)
  - Motivation to change (MI)
  - Group Therapy
  - Individual Therapy
  - Contingency Management
  - Self-Help Recovery Groups (AA)
  - Therapeutic Communities
  - Aversion Therapies
  - Family Involvement/Therapy
  - Twelve-Step Facilitation
  - Relapse Prevention

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## Treatment

- Pharmacologic Intervention
- Treat Co-Occurring Psychiatric Disorders
  - 50% will have another psychiatric disorder
- Treat Associated Medical Conditions
  - cardiovascular, cancer, endocrine, hepatic, hematologic, infectious, neurologic, nutritional, GI, pulmonary, renal, musculoskeletal

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## Websites

- SAMHSA – [www.samhsa.gov](http://www.samhsa.gov)
  - Substance Abuse and Mental Health Services Administration
- NIDA – [www.drugabuse.gov](http://www.drugabuse.gov)
  - National Institute on Drug Abuse
- AAAP – [www.aaap.org](http://www.aaap.org)
  - American Academy of Addiction Psychiatry
- ASAM – [www.asam.org](http://www.asam.org)
  - American Society of Addiction Medicine

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