Objectives

- Review epidemiology of alcohol/substance use disorders
- Review importance of these disorders in medicine
- General overview of medical complications of alcohol/substance use disorders
- Discuss complications specific to alcohol and other substances
Epidemiology

- 2/3 ever consumed alcohol
- ~40% ever used illicit drugs
- 20% use tobacco
- Lifetime prevalence
  - Alcohol use disorders
    - Men - 15-20%
    - Women - 8%
  - Drug use disorders
    - Men – 8%
    - Women – 5%
A Few Statistics

- One million ER visits per year
  - Drug use primary problem
- 20-40% of hospital admissions
- 20% of primary care visits
- 50-75% of trauma visits
- Up to 200,000 deaths per year
- ~40% of suicides involve drugs/alcohol
- Alcohol decreases life expectancy by ~15 yrs
- Economic cost in US - >$400 billion
- Advice, counseling, brief interventions in primary care and ER settings is important!
Societal Costs – Alcohol Use Disorders

Total: ~$185 Billion

†FAS = fetal alcohol syndrome.
http://www.niaaa.nih.gov
Medical Consequences

- **Direct Effects**
  - Toxicity of substance of abuse
  - Toxicity of contaminants

- **Indirect Effects**
  - Infectious diseases
  - Trauma
  - Nutritional deficiencies
  - Consequences of intoxication/withdrawal states
  - Consequences of behaviors associated with substance use
Case #1

- 43 yo woman c/o dyspepsia, epigastric burning and anxiety
- PMH – hypertension
- Meds: Atenolol 25mg qd
- HPI, ROS – unremarkable
- Labs in past year – all WNL
Case #1

- **PE:**
  - Looks anxious
  - Hands are cold, clammy, slightly shaky
  - Wearing strong perfume
  - P: 102 regular
  - BP: 155/101
  - Temp, respirations – normal
  - Remainder of PE only remarkable for mild tachycardia
What’s Your Diagnosis?

- Differential – substance use disorders
  - Mild intoxication – stimulants
  - Withdrawal – alcohol, opioids, sedative/hypnotics

- Clues
  - GI symptoms – gastritis
  - Hypertension
  - Symptoms of alcohol withdrawal
  - Use of perfume, aftershave, mouthwash to cover smell of alcohol
Chronic Alcohol Use

- Cognitive disorders
- CVA
- Psychosis

- Neuropathies
- Anemias
- Nutritional Deficiencies

- Liver Disease
- Cirrhosis

- Pancreatitis
- Diabetes

- Head, Neck, GI cancers

- Coronary Artery Disease
- Cardiomyopathy
- Arrhythmias
- Hypertension
- Stroke

- Stomach ulcers
- Gastritis

- Duodenal ulcers

Nutritional Consequences

- Heavy drinkers – up to 50% of daily caloric intake
  - >25% - ↓significant decrease in necessary nutrients
- Malnutrition
- Vitamin deficiencies
- Impairs activation and utilization of nutrients
- Maldigestion (GI complications)
Specific Deficiencies

- Thiamine
  - Wernicke-Korsakoff’s
  - Neuropathies
- Folate
  - Megaloblastic anemia
- Vitamin C – with high alcohol intake
- Vitamin D
  - Decreased intake, poor absorption, insufficient sunlight
  - Decreased bone mass, density
  - Increased osteoporosis, bone fractures
GI Complications

- Liver
  - ETOH toxic to hepatocytes
  - AST>ALT
  - Accelerates liver damage in hepatitis C infection
  - Increases risk of acetaminophen toxicity
- Range of disease
  - Fatty liver
  - Alcoholic hepatitis
  - Fibrosis
  - Cirrhosis
GI Complications

- Pancreatitis
  - Generally after 10-15 years of heavy ETOH
- GI bleeding
  - Gastritis
  - Peptic ulcer disease
  - Esophageal varices
  - Duodenitis
  - Esophagitis
Neurologic Complications

- Wernicke’s encephalopathy
  - Delirium, ataxia, ophthalmoplegia
  - Thiamine deficiency
  - Necrosis of mammillary bodies and thalamus
  - 50-85% → Korsakoff’s psychosis
  - Few regain cognitive function
Korsakoff’s Psychosis

- Common pathology and etiology as Wernicke’s
- Severe memory impairment
  - Recent and ongoing events
- Confabulation, lack of insight
- Other intellectual functions may be intact
- Treat with thiamine
Alcoholic Dementia

- Prominent effects – frontal cortex, putamen
- Extreme variability
- Etiology
  - Neurotoxic
  - Effects on neurotransmitters
  - Decreased cerebral blood flow
  - Vitamin deficiencies
Alcoholic Dementia

- Impairments
  - Abstract thinking
  - Problem solving
  - Visual, spatial, motor abilities
  - New learning
  - Remote memory
  - Personal care
Other Neurologic Complications

- “Blackouts” – transient anterograde amnesia
- ↑risk of CVA
- ↑risk of cerebral trauma
- Cerebellar degeneration
- Metabolic encephalopathies
- Peripheral neuropathies
  - Sensory, motor or autonomic
  - “Stocking-glove” distribution
Other Organ Systems

- Hematologic
  - Anemias – Fe deficiency, folate deficiency
  - Pancytopenia – alcohol toxic to bone marrow

- Musculoskeletal
  - Rhabdomyolysis
  - Osteopenia/osteoporosis, fractures
  - Myopathy

- Cardiovascular
  - Cardiomyopathy
  - Hypertension

- Dermatologic
  - Facial edema, rosacea, rhinophyma

- Metabolic/endocrine
  - Gout
  - Decreased testosterone
  - Menstrual abnormalities
Case #2

- 39 yo man presents to ER with crushing substernal chest pain
- PMH, Meds – none
- Sxs – 10/10 pain, SOB, diaphoresis
- FH – no CAD
- PE – P:126  BP: 178/115  T:38
- Lab – CPK = 6000; Creatinine = 3.5
- EKG – Sinus tachycardia; ST elevations in anterior leads
What’s Your Diagnosis?

- Clues
  - Sympathetic hyperactivity
    - Hypertension
    - Tachycardia
    - Hyperthermia
  - Organ systems involved
    - Cardiac
    - Rhabdomyolysis
    - Renal failure
  - No medical or family history of similar problems
Cocaine Toxicity

Seizures
CVAs
Perforated nasal septum

Sympathetic hyperactivity
Hypertension
Tachycardia
Hyperthermia

Pulmonary toxicity

GI Ischemia

Angina
MI
Arrhythmias
Cardiomyopathy

Rhabdomyolysis
Myoglobinuria
Acute Renal Failure
Case #3

- 20 yo college student
- Depressed, irritable, anhedonic, insomnia, new erythematous skin lesions – pruritic
- No PMH, no meds, no relevant FH
- PE: remarkable for skin lesions, otherwise normal
- MSE: unremarkable
- You refer patient to dermatologist
Amphetamines

- Complications similar to cocaine
- Cognitive changes
- Dermatologic lesions
Methamphetamine Abuse

From: “Faces of Meth” – the Oregonian – December 28, 2004
Photos courtesy of Bret King, Multnomah County Sheriff’s Department
ED presentations

Acute effects/overdose
- Tachycardia/palpitations
- Hypertension
- Hyperthermia
- Headache
- Chest pain/MI
- CVA
- Tachydysrhythmias
- Anxiety, psychomotor agitation
- Seizures
- Burns
Meth Lab Burns

Photo: Ameri-Chem
Meth Mouth

- Tooth decay
  - Dry mouth
  - Poor hygiene
  - Sugar-laden diet
  - Vasospasm
  - Contaminants or caustics?

Photo: flapsblog.com/?cat=22
Case #4

- 28 yo man brought to ER after witnessed grand mal seizure
- Femur fracture 1 year ago - pain
- No known medications, other PMH, no known head trauma
- No known use of ETOH, tobacco, drugs
- Recent rx of fluoxetine for depression
- PE: post-ictal otherwise normal
- Labs: unremarkable; CT scan: unremarkable
What’s Your Diagnosis?

Questions?
- Any history of medication for pain?
- What pain medication(s) might cause seizures?
  - Meperidine – normeperidine causes seizures
  - Tramadol – high doses may cause seizures
- Any drug interactions with fluoxetine that may be significant?
  - Fluoxetine is an inhibitor of CYP 450 2D6
Opioids

- Relatively nontoxic when used as prescribed
- May impair gonadotropin release
- Heroin
  - Noncardiogenic pulmonary edema
  - Glomerulonephritis
  - Complications from overdose
    - Neurologic, respiratory
- Seizures
  - Normeperidine
  - Tramadol (doses >400mg day)
- Other problems
  - Adverse effects from intoxication/withdrawal states
Case #5

- 18 yo brought to ER at 3AM
- Became confused, disoriented at party
- ETOH/drugs available at party
- She usually doesn’t smoke, drink, use drugs; good student; well-liked;
- PE: T:40  BP:150/110  P:140
  Delirious; skin warm and dry; otherwise WNL
- Lab: Na = 129  Cr = 2.0 CPK = 600
  SGOT = 755  SGPT = 886
  BAL = 20 mg/dl  UDS - negative
What’s Your Diagnosis?

- **Clues**
  - Age of patient
  - At party
  - Hyperthermia, hypertension, tachycardia
  - Hyponatremia
  - Evidence of rhabdomyolysis, elevated creatinine
  - Liver damage
  - Cocaine, amphetamines not detected
MDMA Toxicity

- Delirium
- "Serotonin syndrome"
- Serotonin depletion
- Cerebral infarct/hemorrhage
- ? Neuronal damage/loss
- Hypertension
- Hyperthermia
- Tachycardia
- C-V collapse
- ↑ LFTs
- Fulminant hepatic failure
- Rhabdomyolysis
- Myoglobinuria
- Acute Renal Failure
Marijuana

- Pulmonary toxicity
  - COPD
- Head, neck cancers
- Cognitive deficits
  - Attention, short term memory
  - Information processing
  - Motor impairment
- ↓ Immune response
- ↓ Testosterone levels
- Menstrual abnormalities
Other Substances

- **Nicotine**
  - Pulmonary
  - Malignancies
  - Cardiovascular disease

- **Inhalants**
  - Wide range of adverse effects
  - Neurotoxicity, CV, pulmonary, renal, etc.
ID Complications

- Route of administration
  - Use of needles
  - Intranasal

- High risk sexual practices

- HIV
  - ~25% of IVDU infected

- Hepatitis
  - 65-90% of IVDU infected with HCV
  - 50-70% exposed to HBV

- Local and systemic infections
  - Cellulitis, abscesses
  - Endocarditis, osteomyelitis
Case #1 – Follow-up

- Patient admitted to 3-4 drinks/d
- Denied problem
- Listened carefully to discussion of health effects of alcohol
- Returns 4 weeks later
  - Has been seeing a counselor, wants to stop drinking but has cravings
  - Asked you about “medications”
    - Disulfiram
    - Naltrexone
    - Acamprosate
    - Topiramate
Case #1

- She also wants to quit smoking
- Asks your opinion about
  - Nicotine replacement
  - Bupropion “Zyban”
  - Varenicline – “Chantix”
Case #4 – Follow-up

- Patient recovers uneventfully
- Admits to “Doctor shopping”
- Has multiple prescriptions for tramadol which he has been using in large amounts
- Also buys opioids on the street
- Motivated for treatment, has been struggling with stopping
- Asks about:
  - Methadone maintenance
  - Buprenorphine
Summary

- Common disorders
- Many medical complications
- Patients frequently present to ERs, general medical settings
  - Counseling, advice in these settings can be important!
- Important to assess all patients for alcohol, tobacco, other substance use
  - Complaints may caused/exacerbated by substance use
- Don’t forget about treatment!
QUESTIONS?