Complications, Conditions and Treatment of Cardiovascular Disease and Substance Use Disorders

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Disclosures
None
A major educational gap exists in the clinical knowledge and care management of cardiovascular risk in substance use disorders. Providers need to be aware of best practices to reduce cardiovascular risk in addiction and substance abuse.
Learning Objectives

Upon completion of this learning activity, you will be able to:

1. Describe CV complications of opioid use disorder and other substance use disorders.

2. Describe pharmacotherapies for treatment of opioid use disorder.

3. Discuss strategies to integrate treatment of opioid use disorder in chronic disease management.
Expected Outcome

The desired change/result in practice is to improve care coordination and cardiovascular risk reduction approaches in addiction medicine.
Outline

• Screening and diagnosis of substance use disorders
• Cardiovascular effects of stimulants
• Cardiovascular complications of opioid use disorder and treatment of opioid use disorder
Coronary Artery Disease

Non-Modifiable

- Age
- Genetics

Modifiable

- Diet
- Exercise
- Tobacco
- Alcohol
- HTN, HL
- DM

Environment

Behavior

Society

Culture
Adverse Childhood Experiences

- 1 ACE: 2x odds being ever addicted to drugs
- 5+ ACE: 10x odds ever injecting drugs
### Screening for Substance Use

- **NIDA Quick Screen** – [www.drugabuse.gov/nmassist/](http://www.drugabuse.gov/nmassist/)

#### Quick Screen Question:

**In the past year, how often have you used the following?**

<table>
<thead>
<tr>
<th>Alcohol</th>
<th>Never</th>
<th>Once or Twice</th>
<th>Monthly</th>
<th>Weekly</th>
<th>Daily or Almost Daily</th>
</tr>
</thead>
<tbody>
<tr>
<td>• For men, 5 or more drinks a day</td>
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<tr>
<td>• For women, 4 or more drinks a day</td>
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</table>

| Tobacco Products |       |               |         |        |                       |

| Prescription Drugs for Non-Medical Reasons |       |               |         |        |                       |

| Illegal Drugs |       |               |         |        |                       |
CDC: 50% of people who smoke receive advice to quit from a health professional.
Substance Use Disorder (DSM-5)

Physiologic sequelae
- Tolerance
- Withdrawal
- Craving

Loss of control
- Greater amount / time than intended
- Persistent desire to but unable to cut down
- Excessive time getting, using, recovering

Adverse consequences
- Failure to fulfill responsibilities
- Use in physically hazardous situations
- Social/interpersonal problems
- Give up or ↓ other important parts of life
- Ongoing use despite these problems
Methamphetamine-Involved Hospitalizations

Methamphetamine involved in 29% KY overdose deaths in 2017 (57% increase from 2016)

Alpha- and beta-adrenergic stimulation → hypertension, tachycardia, vasoconstriction

Early atherosclerotic disease
  • 25% incidence of ACS in persons with methamphetamine use and chest pain

Cardiomyopathy – particularly dilated

Aortic dissection

Pulmonary hypertension
Cardiovascular Effects of Cocaine

- Hypertension, tachycardia, endothelial dysfunction, platelet aggregation → can precipitate ACS
- Vasoconstriction can cause coronary vasospasm
- Long-term use → accelerated atherosclerosis
- Cardiomyopathy
- Stimulates alpha- and beta-adrenergic receptors → concern about unopposed alpha stimulation with beta-blockers
  - Likely safe in chest pain and recent cocaine ingestion
  - Lack of data during cocaine intoxication
• NSTE-ACS and recent cocaine or methamphetamine should be treated in the same manner as those without (Class I, C)
  • Except acute intoxication (euphoria, tachycardia, hypertension) – avoid beta-blocker
• Benzodiazepines with or without nitroglycerin for hypertension and tachycardia in NSTE-ACS with intoxication (Class IIa, C)
• Avoid beta-blockers in patients with ACS and recent cocaine or methamphetamine use with acute intoxication – risk of coronary spasm (Class III, C)
Treatment of Stimulant Use Disorders

• No FDA-approved pharmacologic treatments for methamphetamine or cocaine use disorders
• Limited data for topiramate in cocaine use disorder
• Limited data for mirtazapine in methamphetamine use disorder

• Contingency management
  • Vouchers
  • Fishbowl method
>49,000 Opioid Overdose Deaths, 2017
Hospitalizations for Opioid Use Disorder and Associated Infections

Number of hospitalizations

- Endocarditis: 3500
- Osteomyelitis: 2000
- Septic arthritis: 2000
- Epidural abscess: 800

Health Affairs 2016; 35(5):832-837
Endocarditis in Persons who Inject Drugs

- Overall IE mortality ~30% at 1 year
- Isolated TV endocarditis lower mortality ~5%, but higher if surgery needed (~50% at 5 years) (Cahill 2016)
- Proportion of IE hospitalizations associated with IDU increased from 7% to 12.1% from 2000 to 2013 (Wurcel 2016)
- Persons with opioid use disorder (OUD) and IE frequently do not receive treatment for OUD (Fanucchi 2018)
- Referral to addiction treatment associated with lower mortality in IE in PWID (Rodger et al. JAMA Network Open 2018)

Cahill and Prederast, Lancet 2016; Wurcel, et al. OFID 2016; Fanucchi et al. JSAT 2018
Medications

- Full opioid agonist: Methadone liquid (WHO essential med)
- Partial opioid agonist: Buprenorphine (WHO essential med)
- Opioid antagonist: Naltrexone
Medications for Opioid Use Disorder

- Euphoria
- Normal
- Withdrawal
  - Tolerance & Physical Dependence
  - Opioid Agonist Therapy

- Acute use
- Chronic use
Treatment

- Chronic Disease Model
  - Screen, assess, diagnose
  - Medications
  - Behavioral interventions
  - Stepped care approach

- Treatment goals: *remission* and return to function in life

- Relapse rates >80% with abstinence / detox
Buprenorphine/naloxone

- Drug Abuse Treatment Act 2000
- Partial opioid agonist
  - Decreased overdose risk
- Naloxone not active unless injected
  - Decreased abuse risk
- Sublingual, once daily
- Bup/nx 4:1 ratio
- New depot / implants
Buprenorphine vs. Detoxification for Heroin Dependence with Enriched Psychosocial Services

Mortality Risk In and Out of Buprenorphine Treatment

Mortality rates/1000 person years (95% CI)

- Buprenorphine - all cause mortality
- Buprenorphine - overdose mortality

- In treatment
- Out of treatment

Sordo, et al. BMJ 2017
Methadone - Opioid Treatment Program

- Only legal setting for methadone for addiction treatment in US.
- Federal and state regulations
  - Federal: daily dosing first 90 days
  - 5 days to steady state
- Drug interactions; QTc prolongation
- Challenges: stigma, access
Mortality in Methadone Treatment

Mortality Risk In and Out of Methadone Treatment

Mortality rates/1000 person years (95% CI)

Sordo, et al. BMJ 2017
54 Kentucky Counties with Increased Vulnerability to Rapid Dissemination of HIV/HCV Infections Among People who Inject Drugs and Preventive Syringe Exchange Programs (SEPs)

Specific concerns regarding Kentucky Counties:
1. Dense drug user networks similar to Scott County Indiana
2. Lack of syringe exchange programs

NOTE: CDC stresses that this is a REGION-WIDE problem, not just a county-specific problem.
Questions?

• Thank you

• Laura.Fanucchi@uky.edu
Illicit Fentanyl

• Synthetic opioid 50-100x more potent than heroin

MMWR 2008; images: www.dea.gov

Source: CDC, SAMHSA
Access to Medication Decreases Overdose Deaths

Maryland: 50% reduction in overdose deaths

France: 79% reduction in overdose deaths

AJPH 103(5):917-922; Clin Inf Dis 2006: S197-S215