Medical Comorbidities

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Learning Objectives

List common co-occurring medical complications associated with drug use and methods for prevention and treatment.

Presentation Outline

Routine and preventive care

- History
- Physical examination
- Labs

Comorbidities and consequences of SUD

- Cardiovascular
- GI
- Pulmonary
- Renal
- Infectious
- Neuro
- Traumatic injuries
- Endocrine

General Medical Evaluation

Routine/preventive care follows national guidelines (USPSTF)

History and physical evaluation includes categories of assessment employed for all patients, with special focus on the following:

History

- Social and family history
- Emergency Department visits or hospitalizations related to substance use
- Psychiatric history
- Substance related risk behaviors

Physical evaluation

- Vitals
- Observation: signs of intoxication/withdrawal
- ENT: pupils, oral cavity, nasal septum
- Heart: murmur
- Abdomen: liver
- Extremities: injection sites, tremors

General Medical Evaluation

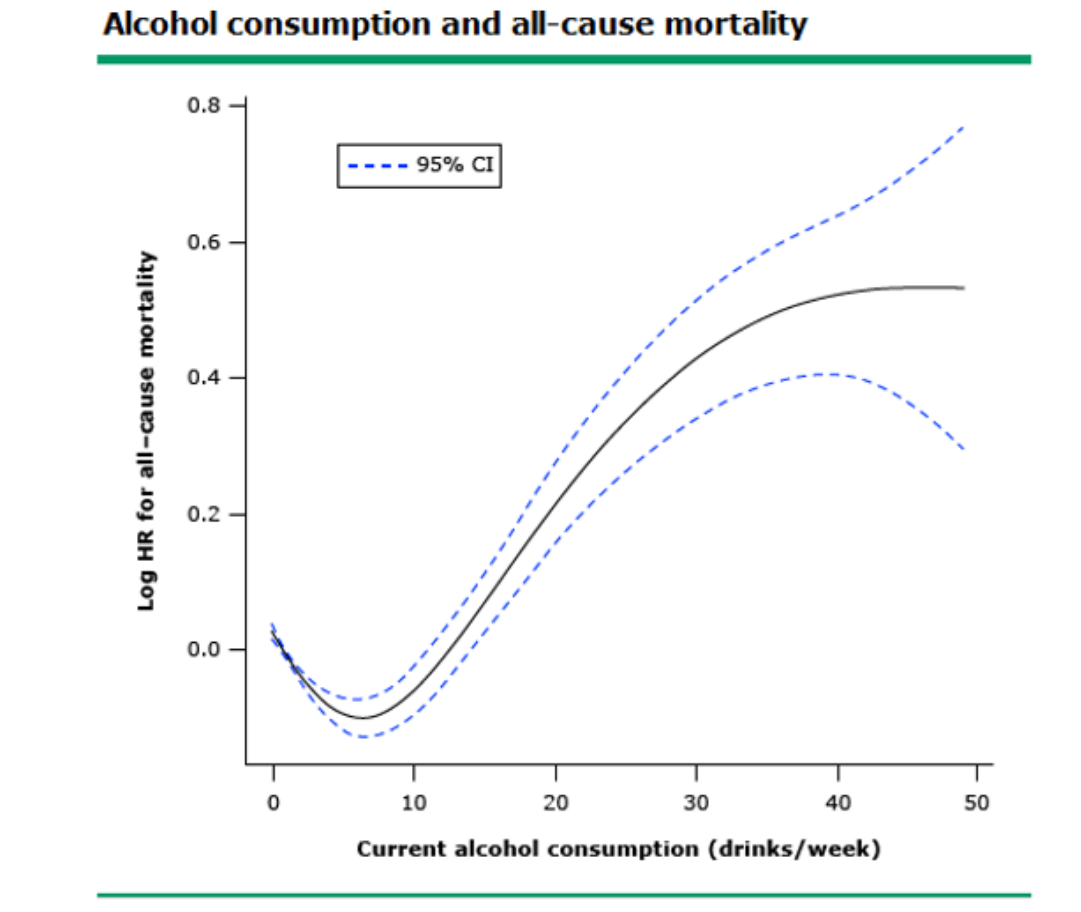
Health maintenance labs:

- Complete blood count
- Metabolic panel
- Liver function
- Lipid panel
- HBA1C
- HIV, HBV, HAV, HCV, PPD, RPR
- Vitamin D

Cardiovascular

- TOBACCO → Atherosclerosis, HTN, CAD
- STIMULANTS → Chest pain, HTN, arrhythmia, cardiomyopathy, MI (avoid beta-blockers)
- OPIOIDS → Methadone can increase QTc
- ALCOHOL → Cardiomyopathy, Afib, HTN, CAD

Cardiovascular



Moderate alcohol intake and cardiovascular benefits

- Association Causality
- Antioxidant (phenolic and flavonoid components red wine), antithrombotic, anti-inflammatory
- No recommendation to drink alcohol for health benefits

Xi B et al. J Am Coll Cardiol 2017

Gastrointestinal

PANCREATITIS

- Abdominal pain
- ↑ amylase/lipase > 3 times upper limit
- > 100g ETOH per day for 5-10 years

Acute

- Acute inflammatory process
- 28% of cases in women and 59% in men due to ETOH

Chronic

- Progressive inflammatory changes
- Permanent structural damage
- Impairment of endocrine/exocrine functions

Gastrointestinal

Alcoholic liver disease

- Risk Factors:
  - Amount of alcohol use
  - Female gender
  - Genetic
  - Obesity
  - Viral hepatitis
  - Hepatotoxins

Gastrointestinal

Alcoholic liver disease

Steatosis

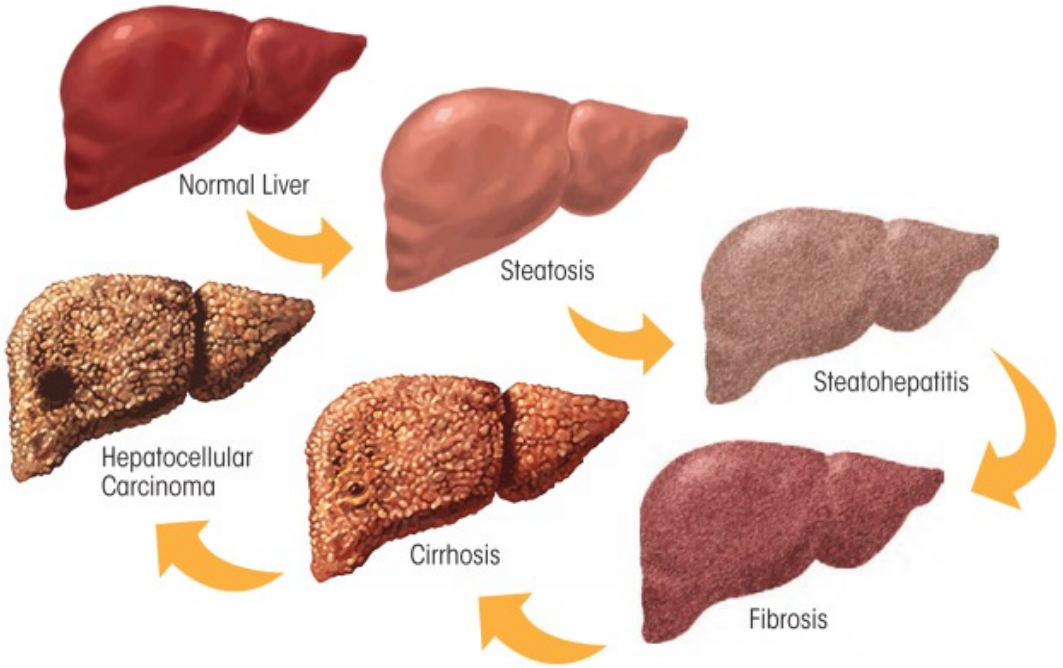
- Anorexia, nausea, RUQ pain
- Potentially fully reversible

Alcohol-related hepatitis

- Jaundice, bruising, ascites, encephalopathy
- AST/ALT ≥ 2:1, ↑ bilirubin, ↑ INR
- Maddrey score ≥ 32 → corticosteroid
- Pentoxifylline may decrease mortality

Cirrhosis

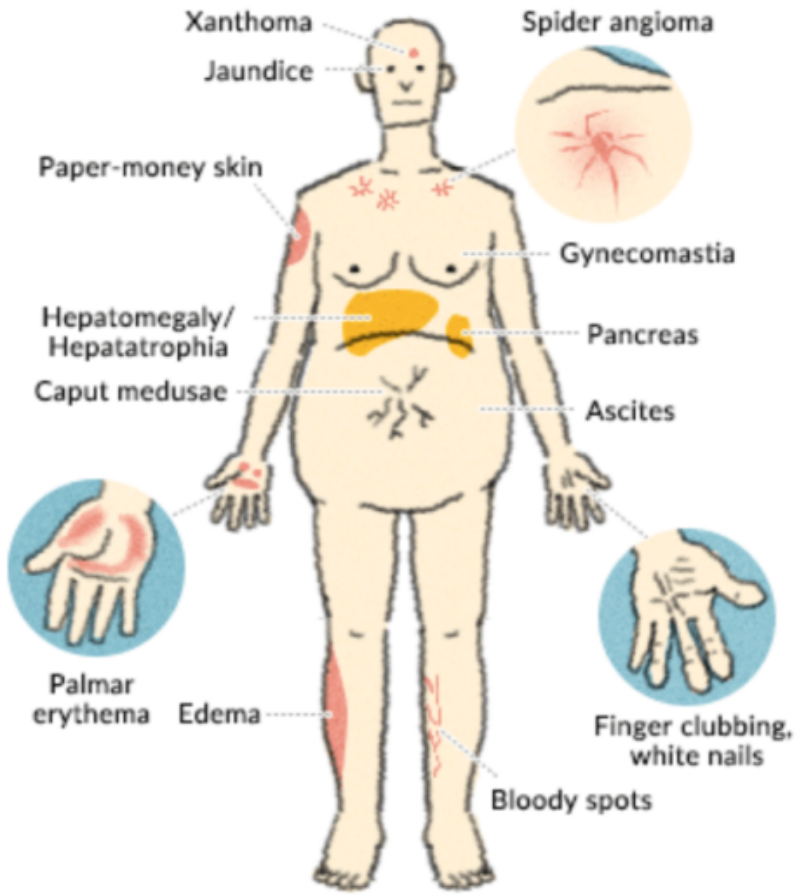
- Late stage of hepatic fibrosis
- Irreversible



Haber PS, Freyer CH. Chapter 81: Liver Disorders Related to Alcohol and Other Drug Use. In: *The ASAM Principles of Addiction Medicine*. Sixth. Wolters Klumer. Osna NA, Donohue TM, Kharbanda KK. Alcoholic Liver Disease: Pathogenesis and Current Management. *Alcohol Res*. 2017;38(2):147-161.

Gastrointestinal

Typical symptoms of liver cirrhosis



Symptoms of liver cirrhosis

- General malaise, fatigue
- Anorexia / weight loss
- Feeling of enlarged abdomen
- Swollen abdomen / legs
- Nose bleed / bleeding from lower limbs
- Jaundice / itch
- Hand tremors

Physical findings

- Skin pigmentation
- Xanthoma
- Spider angioma
- Palmar erythema
- Finger clubbing (hepatopulmonary syndrome)
- Caput medusae
- Gynecomastia
- Fever
- Hepatoceleoma
- Hepatic halitosis (dimethyls -ulphide, ketons in the expired breath)
- Jaundice
- Ascites, lower thigh edema
- Hepatic encephalopathy
- Bleeding plaque / purpura

Akuko Wakuta etc., Hepatobiliary and pancreas, 73(6), 979-984, 2016 (Partially modified)

Gastrointestinal

CANNABIS HYPEREMESIS SYNDROME

- Episodic nausea, vomiting, and abdominal pain
- Relieved by exposure to hot water
- Generally seen in at least weekly users (more often daily users) for at least a year
- Unclear pathophysiology
- Treatment: topical capsaicin on abdomen can relieve acute symptoms, cannabis cessation

Pulmonary Complications

Tobacco COPD Asthma Lung Cancer	**Cannabis** Exacerbation of COPD and asthma	**Opioids** Respiratory depression Sleep apnea
Cocaine Pneumothorax “Crack lungs” Chronic toxicity	**Alcohol** Aspiration pneumonia Ascites Hepatopulmonary syndrome	**Sedative-hypnotic** Respiratory depression
Inhalants Respiratory depression Barotrauma Pulmonary edema	**Amphetamines** Pulmonary hypertension Pulmonary edema	**Anabolic steroids** Pulmonary embolism

Renal

KETAMINE-INDUCED UROPATHY

- Urge incontinence, decreased bladder compliance, decreased bladder volume, detrusor overactivity, hematuria
- Rarely hydronephrosis or papillary necrosis
- Some injuries are permanent, other improve with medical and surgical treatment
- Mechanism unclear: possible irritation from contact of metabolite with bladder and ureteral mucosa

Infectious Complications - Endocarditis

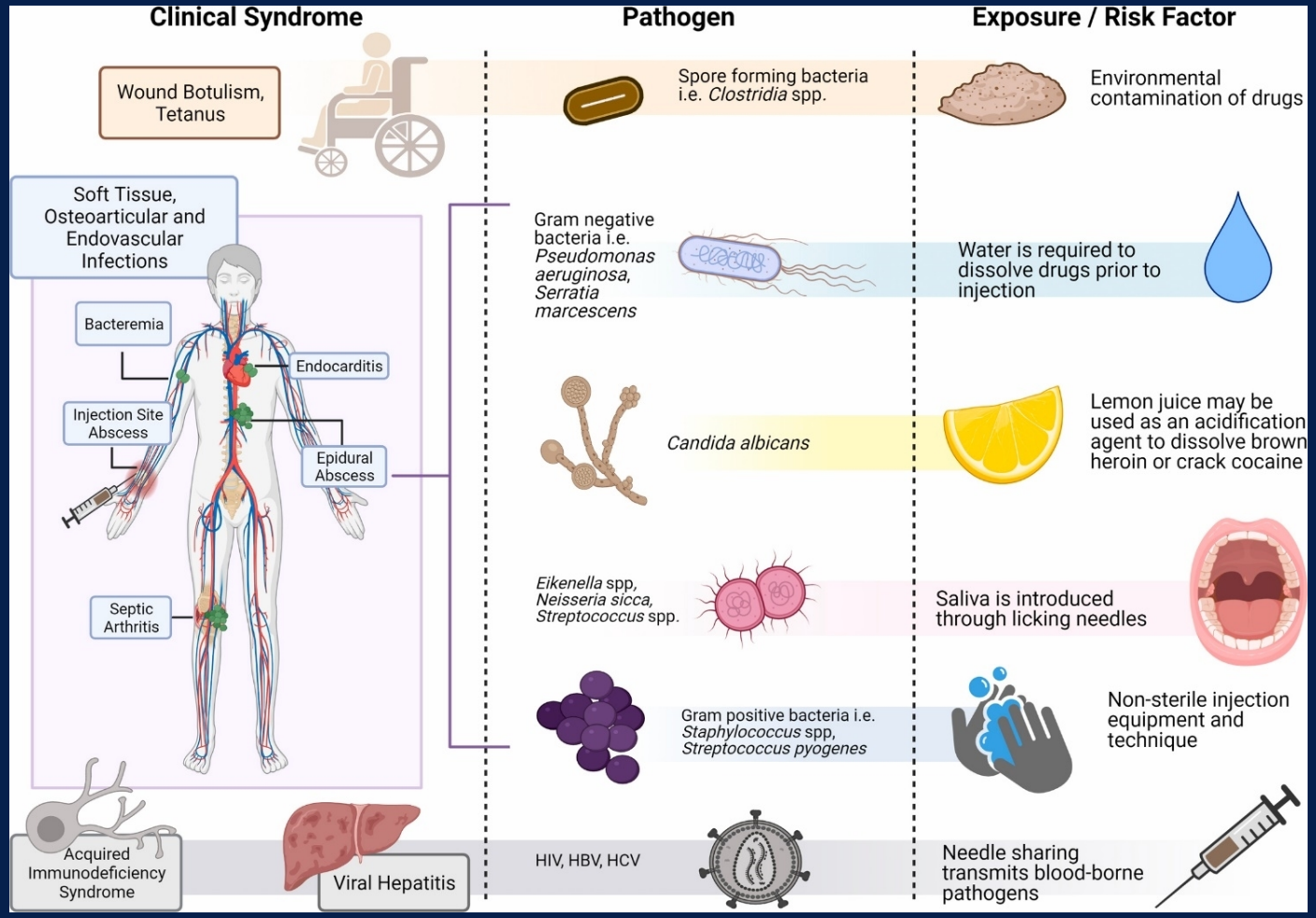


Image from: Marks LR, Nolan NS, Liang SY, Durkin MJ, Weimer MB. Infectious Complications of Injection Drug Use. *Medical clinics of North America*. 2022;106(1):187-200. doi:10.1016/j.mcna.2021.08.006

Infectious Complications - Endocarditis

Endocarditis in people who inject drugs is associated with rising mortality

Infectious endocarditis should be suspected in patients with fever and risk factors:

- **IV drug use**
  - Tricuspid valve
  - IV cocaine use - vasospasm
- IV lines
- Prior IE
- Prosthetic valve, hx of valvular disease
- Cardiac device
- Immunosuppression
- Recent dental or surgical procedure

Treatment: Antibiotic therapy +/- valve surgery

Njoroge LW, et al.. *Cardiol* 2018

Ronan MV, Herzig SJ. *Health Aff (MJAMAilwood) 2016*

Infectious Complications

Sharing of contaminated material is the main driver of HIV and HCV infections among PWID

- Needles
- Auxiliary injection material: dilution water, filters, cookers, backloading, frontloading
- Crack pipes

Infectious Complications

HIV	
Type of exposure	**Risk of infection (%)** [1]
Anal receptive	0.5 to 3.38
Anal insertive	0.06 to 0.16
Vaginal receptive	0.08 to 0.19
Vaginal insertive	0.05 to 0.1
Mother-to-child	15 to 45
Accidental puncture	0.33
Sharing of injection equipment	**0.7 to 0.8**

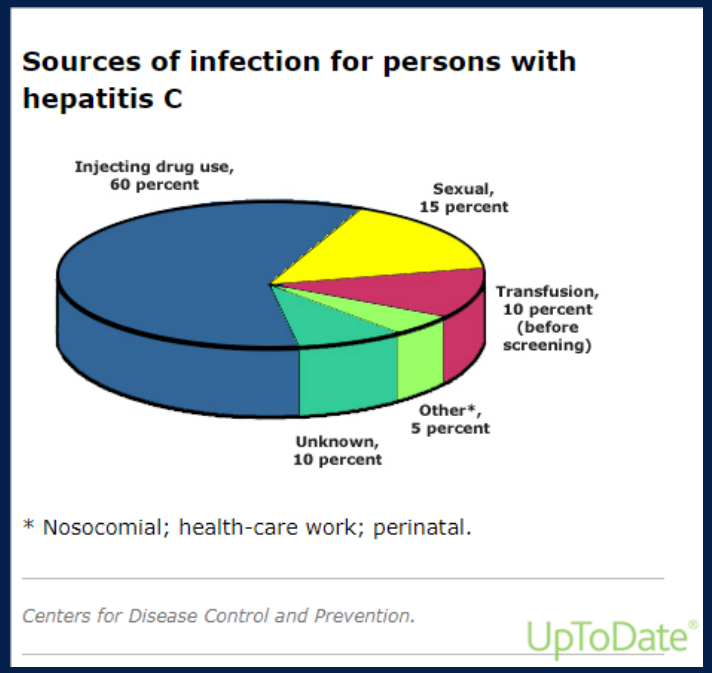
HCV	
Type of exposure	**Risk of infection (%)** [2, 3]
Blood transfusion	Negligible since 1990
Sexual exposure	Low
Sharing of personal items	Low
Tattoo and piercing	Low
Mother-to-child	5 to 6
Accidental puncture	1.8
Sharing of injection equipment	**2.5 to 5**

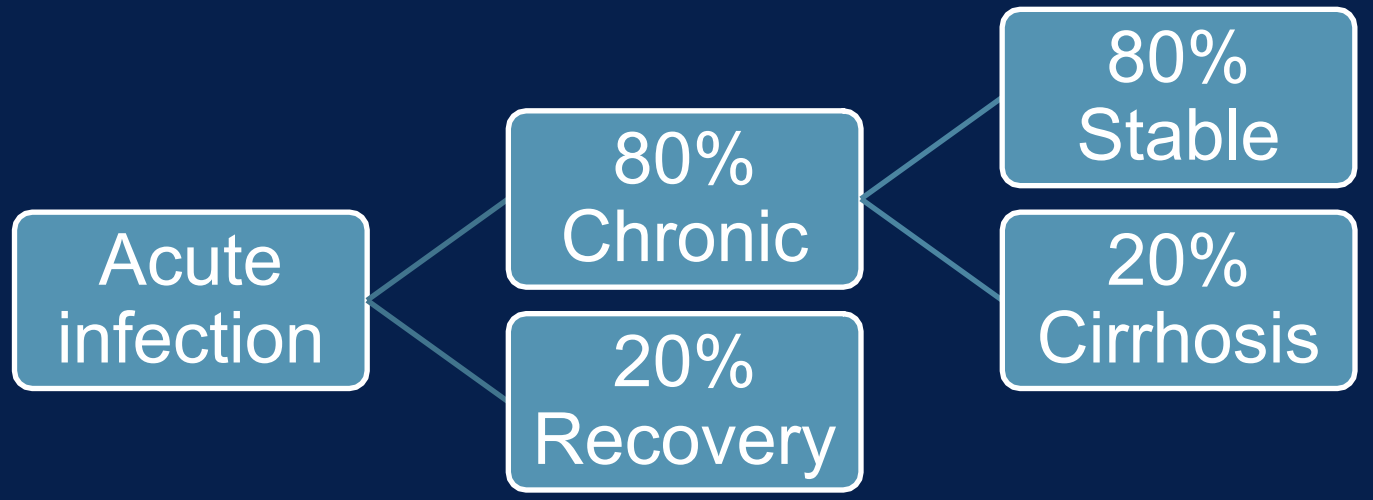
- HIV and HCV viruses can survive several weeks outside of human body
- Viability of virus varies based on virus concentration, medium in which virus is contained, moisture, temperature, sunlight

[1]Public Health Agency of Canada, HIV Transmission Risk: A Summary of Evidence,
[2] Noel L et al. INSPQ 2016.
[3] O'Brien et al. Transfusion 2007

Infectious complications – Hepatitis C

- Most patients with HCV in North America acquired disease through IV drug use

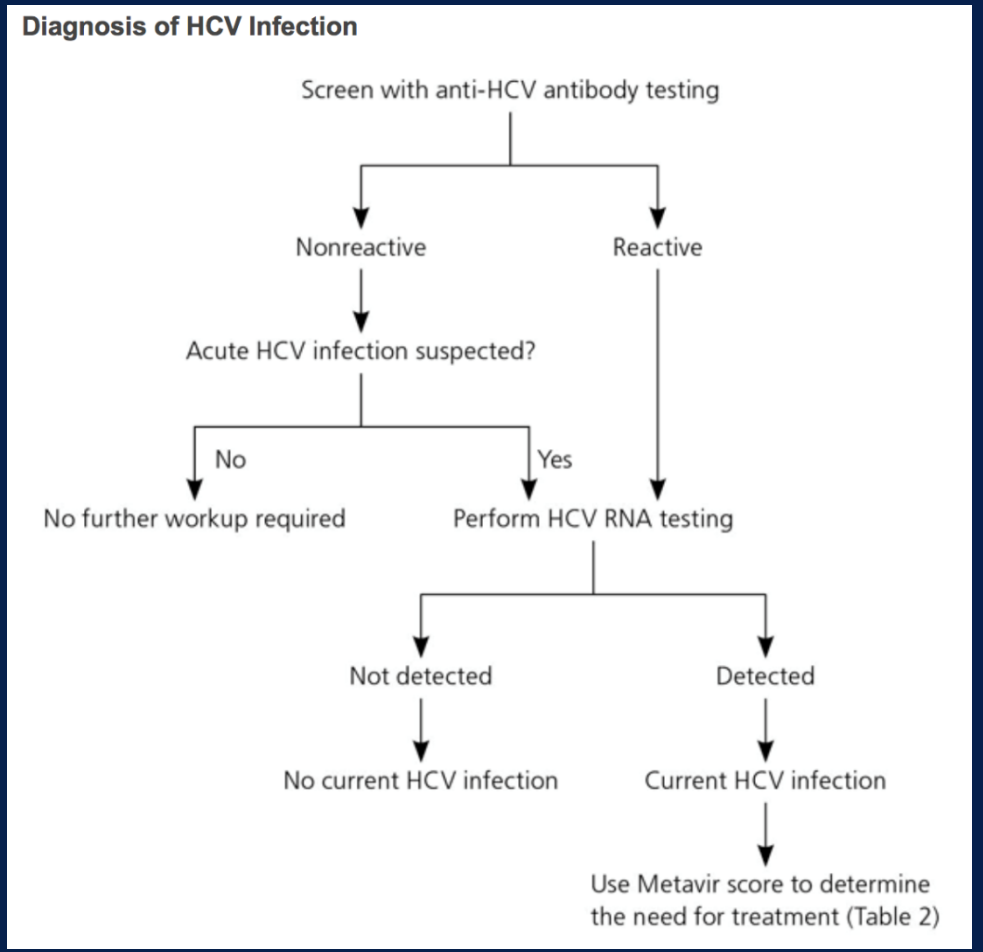




Wilkins T. et al. Am Fam Physician. 2015 Jun 15;91(12):835-842.

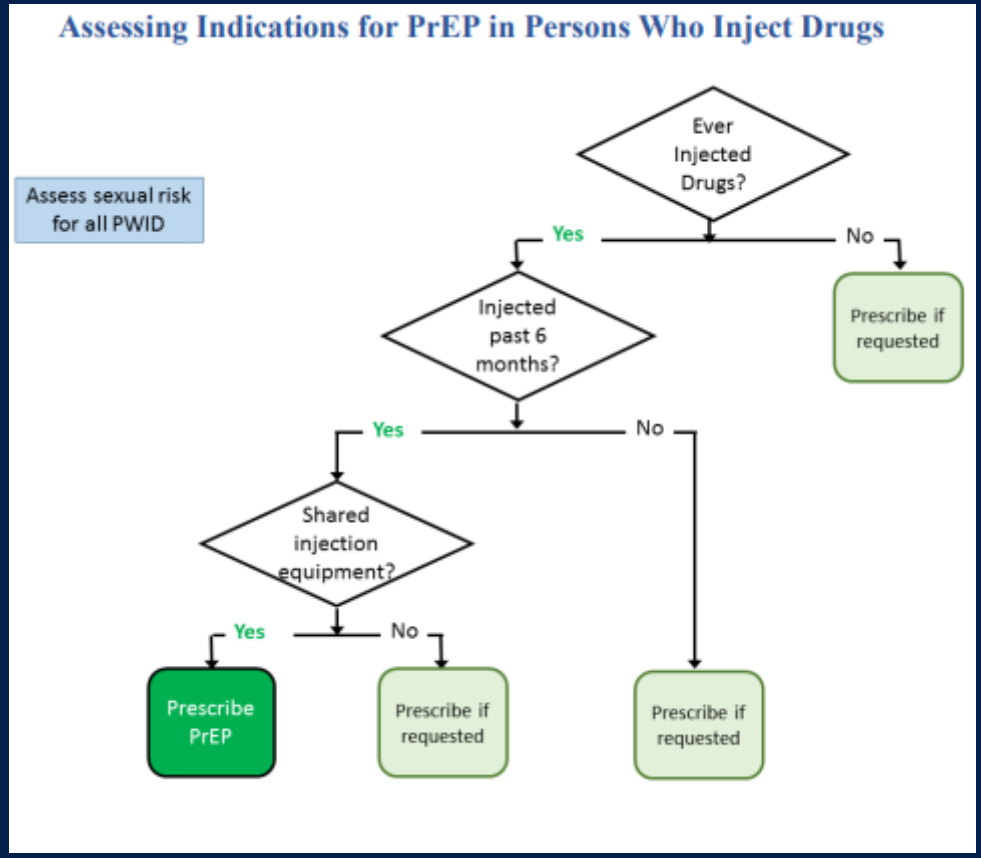
Infectious Complications – Hepatitis C

- Annual HCV testing is recommended for PWID with no prior testing or past negative testing and subsequent injection drug use
- Clinical trials among PWID who report current IDU at the start of HCV treatment and/or continued use during therapy demonstrate SVR rates approaching 95%



Wilkins T. et al. Am Fam Physician. 2015 Jun 15;91(12):835-842.

Infectious Complications –PrEP for HIV



Cdc - Preexposure Prophylaxis For The Prevention Of Hiv Infection In The United States – 2021 Update

Infectious Complications –PrEP for HIV

	Sexually-Active Adults and Adolescents[1]	Persons Who Inject Drug[2]
Identifying substantial risk of acquiring HIV infection	Anal or vaginal sex in past 6 months AND any of the following: • HIV-positive sexual partner (especially if partner has an unknown or detectable viral load) • Bacterial STI in past 6 months[3] • History of inconsistent or no condom use with sexual partner(s)	HIV-positive injecting partner OR Sharing injection equipment
Clinically eligible	**ALL OF THE FOLLOWING CONDITIONS ARE MET:** • Documented negative HIV Ag/Ab test result within 1 week before initially prescribing PrEP • No signs/symptoms of acute HIV infection • Estimated creatinine clearance ≥30 ml/min[4] • No contraindicated medications	
Dosage	• Daily, continuing, oral doses of F/TDF (Truvada®), ≤90-day supply OR • For men and transgender women at risk for sexual acquisition of HIV; daily, continuing, oral doses of F/TAF (Descovy®), ≤90-day supply	
Follow-up care	**Follow-up visits at least every 3 months to provide the following:** • HIV Ag/Ab test and HIV-1 RNA assay, medication adherence and behavioral risk reduction support • Bacterial STI screening for MSM and transgender women who have sex with men[3] – oral, rectal, urine, blood • Access to clean needles/syringes and drug treatment services for PWID **Follow-up visits every 6 months to provide the following:** • Assess renal function for patients aged ≥50 years or who have an eCrCl <90 ml/min at PrEP initiation • Bacterial STI screening for all sexually-active patients[3] – [vaginal, oral, rectal, urine- as indicated], blood **Follow-up visits every 12 months to provide the following:** • Assess renal function for all patients • Chlamydia screening for heterosexually active women and men – vaginal, urine • For patients on F/TAF, assess weight, triglyceride and cholesterol levels	

[1] adolescents weighing at least 35 kg (77 lb)

[2] Because most PWID are also sexually active, they should be assessed for sexual risk and provided the option of CAB for PrEP when indicated

[3] Sexually transmitted infection (STI): Gonorrhea, chlamydia, and syphilis for MSM and transgender women who have sex with men including those who inject drugs; Gonorrhea and syphilis for heterosexual women and men including persons who inject drugs

[4] estimated creatine clearance (eCrCl) by Cockcroft Gault formula ≥60 ml/min for F/TDF use, ≥30 ml/min for F/TAF use

Cdc - Preexposure Prophylaxis For The Prevention Of Hiv Infection In The United States – 2021 Update

Neurologic Complications

SEIZURE

- Intoxication
  - Cocaine, stimulants
- Withdrawal syndromes
  - Alcohol, barbiturates, benzodiazepines
- Opiates: meperidine

STROKE

- At younger age than the general population
- Alcohol, tobacco, cocaine, opioids methamphetamine, LSD, PCP

Neurologic Complications

WERNICKE ENCEPHALOPATHY

- Acute complication of thiamine deficiency
- **Classic triad:**
  - Encephalopathy
  - Oculomotor dysfunction
  - Gait ataxia
- Treatment: IV thiamine before administering glucose

KORSAKOFF SYNDROME

- Late neuropsychiatric consequence of WE
- Anterograde and retrograde amnesia
- Apathy
- Intact sensorium
- Confabulation
- No treatment, rarely recovers

Sleep Disorders - Changes of Sleep Architecture

	Alcohol	Stimulant or cocaine intoxication	Acute cocaine Withdrawal	Subacute cocaine withdrawal	MDMA intoxication	THC intoxication	THC withdrawal
Sleep latency	↓	↑	↑	↓		↑	↑
Total sleep time	↓	↓	↓	↓	↓		
Sleep efficiency	↓		↓	↓			
Slow wave sleep	↓		↓			↓	↓
REM	↓	↓	↑	↓	↓*	↓	↑

Schierenbeck T, *et al*. Effect of illicit recreational drugs upon sleep: Cocaine, ecstasy and marijuana. *Sleep Medicine Reviews*. 2008;12(5):381-389. Chakravorty S, *et al*. Alcohol Dependence and Its Relationship With Insomnia and Other Sleep Disorders. *Alcoholism: Clinical and Experimental Research*. 2016;40(11):2271-2282.

Sleep Disorders

- Negatively affects physical and emotional well-being
- Increases risk of relapse
- First-line of treatment is nonpharmacological
- Sleep hygiene
- Avoid benzodiazepines and z-drugs

Nonpharmacological Treatments Of Insomnia

- **Mindfulness meditation.** The patient moves into a state of restful, present-moment alertness, which reduces stress and improves self-control.[33,34]
- **Progressive muscle relaxation.** The patient concentrates on tensing and relaxing groups of muscles.[8,35]
- **Biofeedback.** The patient becomes aware of physiologic stress responses and how to control them.[26]
- **CBT for insomnia.** The patient's dysfunctional beliefs and behaviors are modified to improve his or her emotional state.[26,36]
- **Stimulus control.** The patient reassociates the bedroom with the rapid onset of sleep.[37]
- **Exercise.** Regular physical activity relieves stress and tires the patient.[26]
- **Sleep restriction therapy.** The patient limits sleep to a few hours and progressively increases it until the desired amount of sleep time is achieved.[26]
- **Bright-light therapy.** Exposure to a natural bright light while awake helps promote normal sleep patterns.[38]
- **Dental devices and continuous positive airway pressure machines.** These devices help the patient with obstructive sleep apnea breathe more easily during sleep.[39]

SAMHSA, Treating Sleep Problems of People in Recovery From Substance Use Disorders 2014

Acute Traumatic Injuries

- Alcohol and other drugs highly associated with traumatic injuries
- In 2016, 43.6% of people killed in driving accidents tested positive for alcohol and/or other drugs
- Most common drugs = marijuana, cocaine/methamphetamine, opioids, sedatives

SAMHSA. Results from the 2017 National Survey on Drug Use and Health

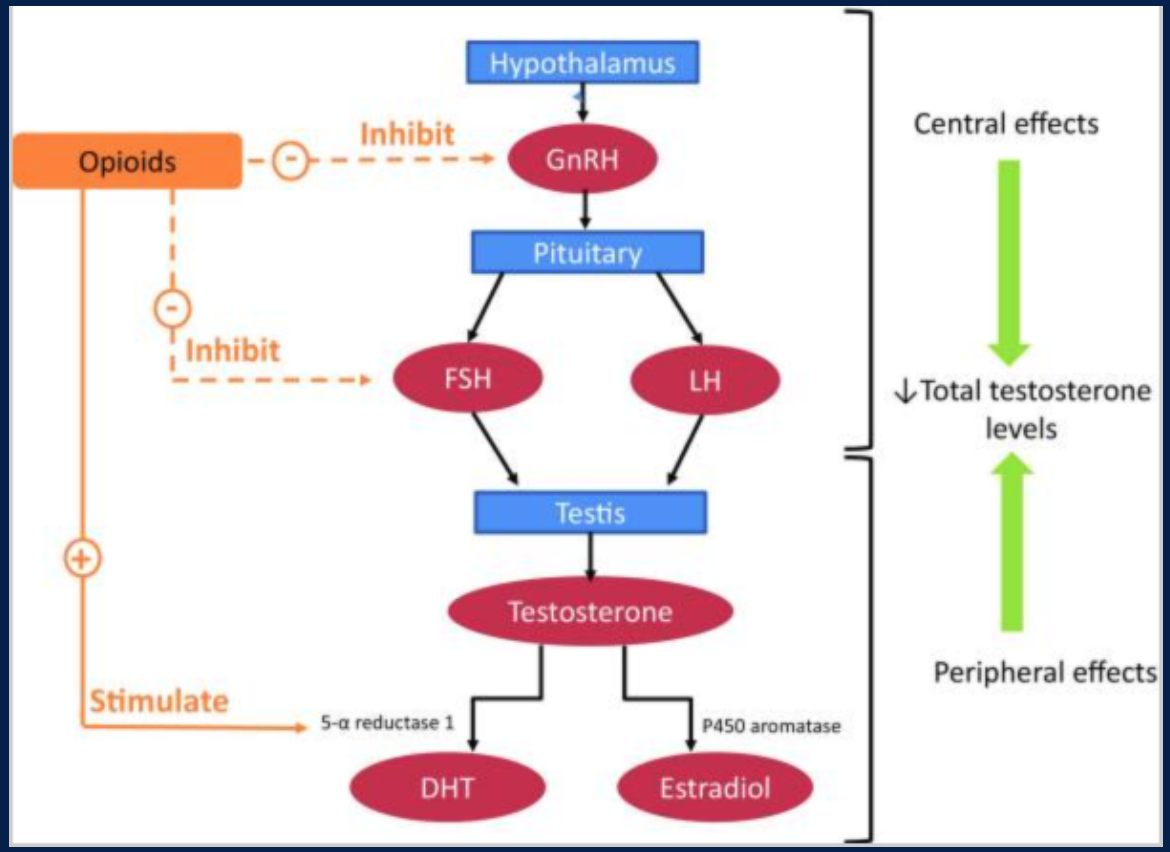
Endocrine and Reproductive

OPIOID INDUCED HYPOGONADISM

- Prevalence estimated between 19% and 86% in individuals chronically taking opioids

Symptoms:

- Change in mood
- Decreased libido/erectile dysfunction
- Decrease muscle strength
- Fatigue
- Osteopenia/osteoporosis
- Menstrual cycle abnormalities
- Hot flashes
- Failure to conceive



Coluzzi F. et al. J Endocrinol Invest. 2018

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