The Consequences of Addiction: Chronic Infectious Diseases

Bost Forum 2018
Ardis Dee Hoven, M.D.
Setting The Stage

• The Story of Austin, Indiana - 2015
  • Wake-up call on the importance of integrating management of SUD and Infectious Disease complications occurring in People Who Inject Drugs (PWID)

• CDC’s Vulnerability Study:
  • County level assessment for rapid dissemination of HIV or HCV
  • 54 KY counties vulnerable
Setting the Stage

- Increase in opioid use and related morbidity/mortality
- Lack of awareness that drug use increases risks for other complications (PWID) particularly infectious diseases
- Disproportionately, young PWID are being infected with HIV/HCV
- KY Overdose fatality rate
  - 1565 in 2017
  - 11.5% increase over the previous year
Infectious Disease Complication Facts

- **HIV**
  - 10% of PWID infected with HIV (KY)
  - 1 in 23 women and 1 in 36 men who inject drugs will be diagnosed with HIV in their lifetime

- **HCV (Hepatitis C virus)**
  - 2017 KY - highest rate of acute HCV infections
  - IDU primary risk factor
  - 60% of new HCV infections injected drugs during the prior 6 months
  - Austin’s co-infection rate with HCV was 92%
  - 85% do not know that they are infected

- **HBV (Hepatitis B virus)**
  - PWIDs have an infection rate of 20%
  - Vaccine preventable
Complications

- Blood stream infections/injection site infections
  - Infective Endocarditis
  - Central nervous system infections
  - Skin and soft tissue infections
  - Bone and joint infections
- Trend: increase in hospitalizations for IE, CNS abscesses, osteomyelitis among younger persons and those conditions associated with IDU (hepatitis, SUD)
Interpreting the Opioid Epidemic via a Blood Borne Pathogen Screening Program

Howard Bost Forum 2018
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Manager, Population Health
Disclosures

• Grant Support from Gilead Sciences Inc. – FOCUS grant
Consider:

- a blood borne pathogens screening program in context of injection drug use
- how data – both the presence and absence of – can inform thinking and medical decision making,
- policies and practices that can result in measurable change.
Norton Healthcare Overview

Market Share 52%: (Approx. 2m patient visits per Year)

4 Hospitals
2,000 Providers
13 ICCs

Urban 85%
Rural 15%
(Approx. 1,000 feeder zip codes)

Payor Mix: Commercial 43.8%, Government 52.3%, Other 4.0%
Testing Models

- Universal Pregnancy Testing @ week 12 and 36 (Outpatient)
- Chief Complaint STI Exposure (Outpatient)
- As Requested or Medically Warranted (Inpatient, Outpatient, ED)
- Universal Pregnancy Testing @ week 12 and 36 (Outpatient)
- Women Well Women Check (Outpatient)
- Chief Complaint STI (Outpatient, ED)
- Chief Complaint Illicit Drug Use (Inpatient, Outpatient, ED)
- Universal Pregnancy Testing @ week 12 and 36 (Outpatient)
- Chief Complaint STI – MSM & Heterosexual (Outpatient, ED)
Definitions

• **Universal screening** – Screened regardless of known or perceived risk-factor(s).

• **Risk-based screening** – Screened based on known or perceived risk factor(s).

• **Prevalence** - the percentage of a population that is affected with a particular disease at a given time
  • Population in the denominator (universal or risk-based screened) will change %
HIV Transmission
Norton Rate 23.5% vs. US Rate 9.0%

*MSM (Men that have sex with men).
HIV IDU

24 Men
- HCV and no STI’s – 41.7%
- STIs and no HCV – 20.8%
- No co-infections – 8.3%
- No additional labs – 29.1%

12 Women
- HCV and STI’s – 33.3%
- STI’s and no HCV – 50.0%
- No additional labs – 16.7%

HCV Screening Year 1

*Best Practice Advisory (BPA)* Targets Baby Boomers

NHC Screening 1 May 2016 to 30 June 2017. N=35,622
HCV Screening Year 2
Standing Order Targets Pregnant/Women Childbearing Age

NHC Screening 1 July 2017 to 30 June 2018. N=36,897
Outcome of Expanded HCV Screening

NHC 24 months data. Yr1 HCV RNA+, N=1079. Yr2 HCV RNA+, N=1174
Prevalence of Active HCV Infections by Cohort

- **US**: 1.0%
- **US Baby Boomers**: 3.25%
- **NHC WCBY**: 3.45%

CDC data 30 April 2018. Norton Healthcare (NHC) data 1 July 2017 to 30 June 2018
Effective 1 July 2018, Kentucky became the first State in the US to mandate universal HCV screening of pregnant women (anticipating 60,000 women screened annually). Moreover, all children born to HCV RNA+ mothers will have “exposure to hepatitis C” noted in their medical record to help ensure that children born to HCV positive mothers are also screened for HCV.
Ensuring Infants are Screened per SB250

- Infants chart includes diagnosis – exposure to HCV
- Timeline of testing between 2 and 24 months established
- HCV AB+ auto reflexes to Quantitative PCR
- auto-generates ambulatory referral to Pediatrics Infectious Disease
- Pediatric ID appointment attended
- Primary pediatrician is notified of HCV ID appointment outcome.

Best Practice
Potential Policies and Best Practices

Modified Kentucky HIV Legislation – KRS. 214.181

Mandated wrap-around services for Medically Assisted Treatment (MAT) programs

Required HIV/ HCV screening for all patients in MAT and substance use programs with the goal of treatment (HIV)/ cure (HCV)

Increased access to Mental and Behavioral Health Programs

Reflex Quantitative PCR for all HCV AB+ tests

Earlier/ More Effective interventions for substance users

Comprehensive Public Health Campaigns on HIV, HCV, and STI
The Consequences of Addiction: Associated Infectious Diseases

Bost Forum 2018
Alice C. Thornton, M.D.
Source of Infection

• Nonsterile equipment
• Unsterile injection practices
  – Water, skin prep, licking needles, etc.
• Narcotic solutions themselves
• Washing drugs out of the syringe with own blood
• Broken needle tips- some use 20-30x
• Own skin flora
• Malnutrition
• Poor living conditions

Infections Associated with Injection Drug Use

- Skin/Soft Tissue: cellulitis (#1), abscess(#2)
- Endocarditis-heart (life time prevalence in this group-10%)
- Thrombophlebitis/Endovascular complications
- CNS infections or strokes
- Bone and Joint Infections
- Viral Infections: Hepatitis A, B,C and HIV

Kay, Ear Nose Throat J, 1996 Oct, Vol 75(10) 670-6
Increases in Hospitalizations from Associated Infections

• Retrospective data – Nationwide Inpatient Sample (NIS) – represents 20% of all US hospitalizations
• Trends in rates of serious infection and the associated costs related opioid abuse/dependence and associated infections resulting in hospitalizations.

Diagnosis of Opioid Associated Infections: 2002 versus 2012

- Increase in hospitalizations: 301,707 vs. 520,275
- Endocarditis: 1.5 fold increase
- Osteomyelitis: 2.2 fold increase
- Septic arthritis: 2.7 fold increase
- Epidural abscess: 2.6 fold increase

Costs

• Medicaid was most common payer
• Costs tripled between 2002 ( $4.57 billion) and 2012($14.85 billion) for opioid use DO
• Opioid related infection (ORI) admissions more than tripled
  – 2002 ($190.68 m) vs 2012 ($700.66m)
  – 2012: Opioid abuse/hospitalization was $28,543 vs ORI/hospitalization was $107,217

UK Healthcare Impact

• 2017 patient encounters with any opioid diagnosis:
  – 1,792 inpatient, 579 ED, 136 observation bed
  – Represents 5% of the total patients admitted
  – UK ID adult inpatient services (except transplant), 50% of all ID consults are IDU related
Counties at Risk for HIV Outbreak As a Result of HIV Drug Use

- Bluegrass Care Clinic Service Area
- Location of the Bluegrass Care Clinic
- PWID Diagnosed with endocarditis
- Counties vulnerable to rapid spread of HIV
Diagnoses of HIV Infection among Persons Who Inject Drugs, by Sex and Race/Ethnicity, 2016—United States and 6 Dependent Areas

Note. Data for the year 2016 are preliminary and based on 6 months reporting delay. Data have been statistically adjusted to account for missing transmission category.

Hispanics/Latinos can be of any race.

HIV Diagnoses Among Persons Who Inject Drugs, by Region and Race/Ethnicity
2016—United States and 6 Dependent Areas

Note. Data for the year 2016 are preliminary and based on 6 months reporting delay. Data have been statistically adjusted to account for missing transmission category. Data exclude men with HIV infection attributed to male-to-male sexual contact and injection drug use.

a Hispanics/Latinos can be of any race.

Downstream Consequences

• Costly both financially and in terms of life
• Can be lifelong: major heart surgery, stroke, loss of family, etc.
• Need innovative strategic approaches
  – Surveillance role for ID associated with OUD - no health system to monitor
  – Loan forgiveness for MAT
  – Syringe access programs
  – MAT
  – Decrease in Stigma
Infection of the endocardium, which is the inner lining of the heart chambers and heart valves

Typically occurs with bacterial infection of the blood stream which can attach to damaged areas of the heart

Occurs more often in damaged or artificial heart valves, but can occur in normal heart valves as well

Leads to valve destruction, heart failure, sudden death

Treatment includes long-term IV antibiotics and heart valve surgery to replace damaged valves

Once valves have been replaced, they are more likely to develop recurrent endocarditis if the patient develops a recurrent infection
Deaths from opioid abuse have increased markedly among the United States population, particularly in young and otherwise healthy people.

Patients who inject drugs are at significantly higher risk of developing bacterial blood-stream infection (bacteremia).

Given the relationship between persistent bacteremia and endocarditis, the United States has seen a significant increase in the number of endocarditis cases as well.
Figure 1. Rising Infective Endocarditis Mortality Among People Who Inject Drugs (1999-2016)
FIGURE 1. Incidence* of hospital discharge diagnoses of drug dependence–associated endocarditis,† by age group—North Carolina, 2010–2015

*Incidence calculated using hospital discharge data only.
†Endocarditis defined as ICD-9 code 420.xx, ICD-10 code I10.x, or ICD-11 code I10.x.

Fleischauer AT et al. MMWR 2017;66:569-73
INCIDENCE OF ENDOCARDITIS


Fleischauer AT et al. MMWR 2017;66:569-73
Fleischauer AT et al. MMWR 2017;66:569-73
Long-term antibiotics and valve surgery treat the result of opioid abuse but do not treat the underlying problem.

Patients who relapse may develop infection of their artificial valves requiring repeat surgery with poor long-term success. Are surgeons obligated to operate on such patients?

Best opportunity for long-term success is by treating the opioid abuse at the same time as the treatment of cardiovascular disease.
Putting Parity into Practice — Integrating Opioid-Use Disorder Treatment into the Hospital Setting
Laura Fanucchi, M.D., M.P.H., and Michelle R. Lofwall, M.D.

NEJM 2016;375:811-3
Expanding access to addiction treatment services

Medication-assisted therapies (MAT)
- Initiation during hospitalization is ideal, but many issues prevent widespread utilization
- Limited availability of outpatient providers
- Insurance coverage

Safe needle practices

More clinical research
<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Methadone</th>
<th>Buprenorphine</th>
<th>Naltrexone</th>
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<tbody>
<tr>
<td>Brand names</td>
<td>Dolophine, Methadose</td>
<td>Subutex, Suboxone, Zubsolv</td>
<td>Depade, ReVia, Vivitrol</td>
</tr>
<tr>
<td>Class</td>
<td>Agonist (fully activates opioid receptors)</td>
<td>Partial agonist (activates opioid receptors but produces a diminished response even with full occupancy)</td>
<td>Antagonist (blocks the opioid receptors and interferes with the rewarding and analgesic effects of opioids)</td>
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<td>Use and effects</td>
<td>Taken once per day orally to reduce opioid cravings and withdrawal symptoms</td>
<td>Taken orally or sublingually (usually once a day) to relieve opioid cravings and withdrawal symptoms</td>
<td>Taken orally or by injection to diminish the reinforcing effects of opioids (potentially extinguishing the association between conditioned stimuli and opioid use)</td>
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<td>Advantages</td>
<td>High strength and efficacy as long as oral dosing (which slows brain uptake and reduces euphoria) is adhered to; excellent option for patients who have no response to other medications</td>
<td>Eligible to be prescribed by certified physicians, which eliminates the need to visit specialized treatment clinics and thus widens availability</td>
<td>Not addictive or sedating and does not result in physical dependence; a recently approved depot injection formulation, Vivitrol, eliminates need for daily dosing</td>
</tr>
<tr>
<td>Disadvantages</td>
<td>Mostly available through approved outpatient treatment programs, which patients must visit daily</td>
<td>Subutex has measurable abuse liability; Suboxone diminishes this risk by including naloxone, an antagonist that induces withdrawal if the drug is injected</td>
<td>Poor patient compliance (but Vivitrol should improve compliance); initiation requires attaining prolonged (e.g., 7-day) abstinence, during which withdrawal, relapse, and early dropout may occur</td>
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Partial Oral versus Intravenous Antibiotic Treatment of Endocarditis

Iversen K et al. NEJM 2018
Fig. 1 Annual trends in donors from drug overdose utilized in solid organ transplantation in the United States from 2000 to 2016. a Annual trend in the number of drug overdose donors. b Annual trend in the percentage of donors utilized from drug overdose.