The Opioid Epidemic: A Public Health Perspective

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**PREVIOUS EXPERIENCE**

- Secretary of Maryland Department of Health and Mental Hygiene
- Principal Deputy Commissioner of the U.S. Food and Drug Administration
- Baltimore City’s Commissioner of Health
- Policy Advisor for former Congressman Henry A. Waxman

**DISCLOSURE**

- Consultant to Audacious Inquiry on health information exchange
- Consultant on payment reform and public health for Sachs Policy Group
Challenge

U.S. sunk to 31st worldwide in 2015 down from 28th worldwide in 2000

For the first time since World War I and the Great Influenza, U.S. life expectancy has declined over 3 years.

Life Expectancy by Country, 2015 (age in years)  Source: WHO

Japan 83.7
Switzerland 83.4
Singapore 83.1
Australia 82.8
Spain 82.8
Iceland 82.7
Italy 82.7
Israel 82.5
France 82.4
Sweden 82.4
Republic of Korea 82.3
Canada 82.2
Luxembourg 82.0
Netherlands 81.9
Norway 81.8
Malta 81.7
New Zealand 81.6
Austria 81.5
Ireland 81.4
United Kingdom 81.2
Belgium 81.1
Finland 81.1
Portugal 81.0
Germany 81.0
Greece 80.8
Slovenia 80.6
Denmark 80.5
Chile 80.5
Cyprus 79.6
Costa Rica 79.3
United States of America 79.3
The Opioid Epidemic in the United States

2015 Cause of Death Comparisons

<table>
<thead>
<tr>
<th>Cause</th>
<th>2015 Count</th>
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<tbody>
<tr>
<td>CAR CRASH</td>
<td>37,757</td>
</tr>
<tr>
<td>GUNS</td>
<td>35,763</td>
</tr>
<tr>
<td>OPIOID OVERDOSE</td>
<td>33,000</td>
</tr>
</tbody>
</table>

Areas with high opioid deaths include rural, urban, and suburban counties

2017 Opioid Deaths

ESTIMATE 47,000

Over 2 million Americans are addicted to opioids

Legend for estimated age-adjusted death rate (per 100,000 population)

<table>
<thead>
<tr>
<th>Death Rate Range</th>
<th>Color</th>
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<tbody>
<tr>
<td>&lt;2</td>
<td>Blue</td>
</tr>
<tr>
<td>2-3.9</td>
<td>Purple</td>
</tr>
<tr>
<td>4.5-9</td>
<td>Green</td>
</tr>
<tr>
<td>6-7.9</td>
<td>Yellow</td>
</tr>
<tr>
<td>8-9.9</td>
<td>Orange</td>
</tr>
<tr>
<td>10-11.9</td>
<td>Orange</td>
</tr>
<tr>
<td>12-13.9</td>
<td>Yellow</td>
</tr>
<tr>
<td>14-15.9</td>
<td>Yellow</td>
</tr>
<tr>
<td>16-17.9</td>
<td>Orange</td>
</tr>
<tr>
<td>18-19.9</td>
<td>Orange</td>
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<tr>
<td>20-21.9</td>
<td>Red</td>
</tr>
<tr>
<td>22-23.9</td>
<td>Red</td>
</tr>
<tr>
<td>24-25.9</td>
<td>Red</td>
</tr>
<tr>
<td>26-27.9</td>
<td>Red</td>
</tr>
<tr>
<td>28-29.9</td>
<td>Red</td>
</tr>
<tr>
<td>30+</td>
<td>Red</td>
</tr>
</tbody>
</table>

Opioid Death Rate Per 100,000 People, 2016

Source: SAMHSA
What Are Opioids?

**Opioids** are a group of chemical compounds that share the characteristic of stimulating receptors on the surface of cells called opioid receptors.

Opioid receptors are found in different parts of the brain and throughout the body.

Source: NIH
What Are Opioids?

• Opioids differ from one another in several ways:
  ➢ Potency
  ➢ Duration
  ➢ Solubility in fat
  ➢ Impact on receptors
  ➢ Binding to receptors

Source: DEA
**Tolerance** refers to how the body adapts to opioids so that increasing amounts may be needed to have the same effects. Tolerance occurs because the opioid receptors on the surface of cells become desensitized and because the cells start to produce fewer receptors.

“The bad news is that I need more opioids to get pain relief. The good news is I am less sleepy on my medication.”
What Is Withdrawal?

Withdrawal is a series of symptoms experienced by people who have been taking opioids in a sufficient dose and duration (usually about 60 mg of morphine or equivalent for a week) and then quickly cut back or stop.

Withdrawal occurs because the brain, skin, eyes, nose, bones and intestinal tract, which became used to the presence of opioids, now respond to their absence.
Physical dependence is a concept closely tied to tolerance and withdrawal.

“My body has become tolerant to opioids, and if I stopped using abruptly, I would experience withdrawal. That means I am now physically dependent.”
What Is Physical Dependence?

Key Point Alert

Anyone who takes opioids in a sufficient dose and duration for any reason will develop physical dependence.

So physical dependence is not the same as addiction.
What Is Opioid Addiction?

**Addiction** is characterized by pathological craving and compulsion that drives someone to keep using a substance even in the face of severe negative consequences to the person’s life, including the threat of death.

“Addiction is considered a brain disorder, because it involves functional changes to brain circuits involved in reward, stress, and self control, and those changes may last a long time after a person has stopped taking drugs.” – National Institutes of Health

Source: NIH

Addiction is a chronic disease.
Learning Objectives

- Understand the current opioid epidemic in historical context
- Appreciate steps to address misuse of prescription drug and illicit opioids
- Consider key issues for pediatrics in the opioid crisis
The US Opioid Epidemic

• Conceptual framework, from history
• Prescription Opioids
• Illicit Opioids
• Focus on Children
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Past: The Opioid Epidemic of the Late 19th/Early 20th Century

1. The Civil War
2. Late 19th Century: Overprescribing
3. Early to mid 20th Century: Illicit Opioids Lead to a Harsh Response
4. Late 20th Century: “War on Drugs”

To historians, The story of opioids is “The American Disease”
The Civil War

• 10 million opium pills and 2.8 million ounces of other opioid products provided to Union soldiers alone

• Addiction known as “soldier’s disease”

• End of war coincided with invention of hypodermic needle
Late 19th Century

- Broadly recommended for medical conditions, particularly for “female complaints”

- Complicated by medicalization of upper class women’s experiences

- As many as 250,000 habitual users

Uterine and ovarian complications cause more ladies to fall into the habit, than all other diseases combined.

— An observer of the late 19th century, quoted in Dark Paradise by David Courtwright

You don’t know what morphine means to some of us, many of us, modern women without professions, without beliefs, Morphine makes life possible.

—A woman of early 20th century, quoted in Dark Paradise by David Courtwright
A Crisis in Overprescribing in the late 19th/Early 20th Century

• Rise in addictive behavior leads to blame on physicians

• 1903 Pure Food and Drugs Act requires labeling for amount of opioids

He who is compelled to resort frequently to opium and stimulants” for menstrual cramps “must be considered devoid in diagnostic ability, and consequently ought not to be entrusted with the management of such cases

– Gynecology textbook, 1898 (Dark Paradise)

The murderer who destroys a man’s body is an angel beside one who destroys that man’s soul and mind.

--1903 national report
As illicit opioid use rises, harsh response

- In early 20th century, a changing face of opioid addiction
- First US ban addresses only smoking of opium
- Through the Harrison Act and Supreme Court decisions, physicians charged and jailed for supplying opioids, even for treatment of addiction.

If the [] cannot get along without his “dope,” we can get along without him

— The Committee of the Acquisition of the Drug Habit, 1903

What we think about addiction very much depends on who is addicted.

--Historian David Courtwright
Physician convicted for “gratification of this diseased appetite for these pernicious drugs”

Crackdown includes large penal “narcotic farms”

1956: death penalty for trafficking, mandatory minimums
The War on Drugs

- 1960s sees boom in opioid use, including in counterculture and in returning Vietnam War veterans

- Nixon aimed both to increase prosecution of narcotics cases and to “destroy the market for drugs and this means the prevention of new addicts, and the rehabilitation of those who are addicted.”
1980s: Enforcement >> Treatment

- Crack epidemic associated with urban areas draws harsh response
- Significant inequity in criminal penalties
- Mayor Schmoke and others call for public health approach, to little avail
What do we learn from history?

1. Not the first opioid crisis.

2. “What we think about addiction depends very much depends on who is addicted.”

3. The response can make things worse.

4. How about a public health approach this time?
The US Opioid Epidemic

- Conceptual framework, from history
- Prescription Opioids
- Illicit Opioids
- Focus on Pediatrics
Rise in Prescribing for Pain

Threefold *increase in opioid prescribing* between 1991 and 2010

**Several factors contributing:**

1. 1-time prescriptions (post surgery) for too many pills
2. Increased use of opioids for chronic, non-cancer pain in primary care, in part because of patient pressure
3. “Pill mills” – fraudulent prescribing

**Opioid Prescriptions in the United States**  
*Source: NIDA*
Why Such a Dramatic Increase in Opioid Prescribing?

- The **professional and patient movement** to focus on pain began in early 1990s and picked up steam with financial support from the pharmaceutical industry.

- The industry supported organizations that pushed to **adopt “pain as a 5th vital sign,”** pain as a patient satisfaction score, and pain measured at every clinical assessment in the hospital.

- Medical societies - with contributions from the industry - published statements **supporting use of opioids for chronic pain** in 1997.

### Pain Considered a Vital Sign in Some Hospitals and Clinics

<table>
<thead>
<tr>
<th>Vital Signs</th>
<th>1st</th>
<th>2nd</th>
<th>3rd</th>
<th>4th</th>
<th>5th</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>Body Temperature</td>
<td>Pulse</td>
<td>Respiratory Rate</td>
<td>Blood Pressure</td>
<td>No pain</td>
</tr>
<tr>
<td>2nd</td>
<td>Pulse</td>
<td>Respiratory Rate</td>
<td>Blood Pressure</td>
<td></td>
<td>Very mild</td>
</tr>
<tr>
<td>3rd</td>
<td>Respiratory Rate</td>
<td>Blood Pressure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4th</td>
<td>Blood Pressure</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5th</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
Some Progress on Rx Opioids

>30% decline since peak

Several factors contributing:

1. New professional standards
2. CDC guidelines
3. State laws

Opioid Prescribing Declining Since 2011

- Opioid Prescriptions
- Morphine Milligram Equivalents
The US Opioid Epidemic

• Conceptual framework, from history
• Prescription Opioids
  • Illicit Opioids
• Focus on Pediatrics
A Changing Epidemic

Over-prescribing of opioids for chronic pain has contributed to surge in heroin and other illicit drug use pure and cheap heroin has become increasingly available.

As opioid prescribing has tightened, many people switched to illicit opioid sources.

More than half of US opioid deaths in 2017 were caused by street drugs.
Street fentanyl is the major cause of increasing deaths from opioids

According to CDC, there were more than **29,000** deaths related to fentanyl in 2017 in the United States.

In **Maryland**, the number of fentanyl deaths increased from **26** in 2007 to **1594** in 2017.

Number of Fentanyl-Related Deaths Occurring in Maryland, 2007-2017

*Source: Maryland Department of Health*
What Is Effective Treatment for Opioid Addiction?

- Medication
- Counseling and Peer Support
- Social Support
How do medications for opioid addiction work?

All 3 medications work at the level of the opioid receptors to reduce cravings.

None of the medications produce euphoria for patients at therapeutic doses.

None of the medications produce fatigue at therapeutic doses.
How do medications for opioid addiction work?

<table>
<thead>
<tr>
<th></th>
<th>Depot Naltrexone</th>
<th>Buprenorphine</th>
<th>Methadone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduces Cravings</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Reduces Misuse</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Reduces Overdose</td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Reduces Infectious Disease</td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Reduces Mortality</td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Increases Employment</td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Reduces Criminality</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Track record &gt; 20 years</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>

Published Evidence to Date

Treatment with effective medications is not addiction by another means.
Key Intervention: Effective, Evidence-Based Treatment

- **Life-saving.** Risk of overdose deaths reduced by up to 70% when patients are receiving treatment that includes approved medications (methadone and buprenorphine).

- **Contributes to population-wide improvement.** In Baltimore, there was a 75% decline in heroin overdose deaths from 1999 to 2011 as access to treatment increased.

- **Gaps in access to care.**
  - Many people that suffer from addiction are not able to access treatment.
  - Less than 1/3 of those receiving treatment receive effective medicines.

Medications Decrease Heroin Overdose
Baltimore, Maryland, 1995-2009

**RESULTS** Seventy-eight percent of patients in the buprenorphine group (89 of 114 [95% CI, 70%-85%]) vs 37% in the referral group (38 of 102 [95% CI, 28%-47%]) and 45% in the brief intervention group (50 of 111 [95% CI, 36%-54%]) were engaged in addiction treatment on the 30th day after randomization (P < .001). The buprenorphine group reduced the number of days of illicit opioid use per week from 5.4 days (95% CI, 5.1-5.7) to 0.9 days (95% CI, 0.5-1.3) vs a reduction from 5.4 days (95% CI, 5.1-5.7) to 2.3 days (95% CI, 1.7-3.0) in the referral group and from 5.6 days (95% CI, 5.3-5.9) to 2.4 days (95% CI, 1.8-3.0) in the brief intervention group (P < .001 for both time and intervention effects; P = .02 for the interaction effect). The rates of urine samples that tested negative for opioids did not differ statistically across groups, with 53.8% (95% CI, 42%-65%) in the referral group, 42.9% (95% CI, 31%-55%) in the brief intervention group, and 57.6% (95% CI, 47%-68%) in the buprenorphine group (P = .17). There were no statistically significant differences in HIV risk across groups (P = .66). Eleven percent of patients in the buprenorphine group (95% CI, 6%-19%) used inpatient addiction treatment services, whereas 37% in the referral group (95% CI, 27%-48%) and 35% in the brief intervention group (95% CI, 25%-37%) used inpatient addiction treatment services (P < .001).

Source: D’Onofrio, JAMA, 2015
A Public Health Agenda for Law Enforcement

- Naloxone
- Syringe exchange
- Other innovative approaches

Ten Standards of Care

1. **Focus** on overdose deaths.
2. **Use** Naloxone.
3. **Educate** on addiction and stigma.
4. **Refer** to treatment.
5. **Advocate** for "on demand" treatment access.
6. **Advocate** for treatment for those who are incarcerated or under community supervision.
7. **Prevent** outbreaks.
8. **Consider** fentanyl detection.
9. **Explore** innovation.
10. **Support** Good Samaritan laws.
The US Opioid Epidemic

- Conceptual framework, from history
- Prescription Opioids
- Illicit Opioids
- Focus on Children
• Adolescents
• Parents and their children
Adolescents

- From 1991 to 2012, rate of misuse of opioid medications among teenagers more than doubled. So did the rates of opioid addiction, hospitalizations for overdose, and fatal overdose.

- In 2014, close to 500,000 teens reported misuse of opioid pills, with more than 150,000 reporting symptoms of addiction.

- Adolescents tend to understate addictiveness of opioids. First symptoms may be trouble in school, poor behavior at school, trouble with the law, or overdose.

- Opioid use associated with use of other drugs, suicide, and risky sex.
Adolescents

• True/False

• Medications such as buprenorphine work for adolescents with opioid addiction?

• Residential treatment programs can help adolescents with opioid addiction?

• Parents should have naloxone at home?

• Family therapy and family support is helpful for families of adolescents with opioid addiction?

• Most easily accessible programs online are high quality?
Adolescents

• True/False

  • Medications such as buprenorphine work for adolescents with opioid addiction? TRUE

  • Residential treatment programs can help adolescents with opioid addiction? TRUE

  • Parents should have naloxone at home? TRUE

  • Family therapy and family support is helpful for families of adolescents with opioid addiction? TRUE

  • Most easily accessible programs online are high quality? FALSE
Babies

• Frame of reference
Parents and Children

• Frame of reference
Parents and Children

• If frame is **babies** →
  
  • Focus on risk of opioid exposure
  • Dramatize neonatal abstinence syndrome
  • Consider punitive actions on mother
  • Advise mother not to take medications, including methadone or buprenorphine

• If frame is **broader** →
  
  • Focus on risk of maternal substance misuse
  • Do not overdramatize neonatal abstinence syndrome
  • Provide support for mom and baby; some great models of care.
  • Advise mother to take medications that are recommended by CDC, American College of Obstetrics and Gynecology, and the American Academy of Pediatrics
Questions?