Opioid and Other Substance Use Disorders: Origins and Scope of the Problem

Robert Valuck, PhD, RPh, FNAP

Departments of Clinical Pharmacy, Epidemiology, and Family Medicine
Director, Colorado Consortium for Prescription Drug Abuse Prevention

Presentation to the Colorado General Assembly
Opioid and Other Substance Use Disorders Interim Study Committee

July 10, 2017
Objectives

• Table setting: terms and definitions (and why we should care)

• Scope of substance use disorders problem in the U.S.

• Discuss factors contributing to the growth in opioid and other substance use disorders

• Highlights from the *Surgeon General’s Report on Alcohol, Drugs, and Health* to help frame the discussion
Preferred Terms and Definitions

• **Substance**: A psychoactive compound with the potential to cause health and social problems, including substance use disorders (and their most severe manifestation, addiction). Substances include alcohol, illicit drugs, Rx medications used for non-medical purposes, and over-the-counter drugs and other substances such as inhalants (nicotine, cannabis).
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• **Substance Use**: The use—even one time—of any substance.

• **Substance Misuse (not “Abuse”)**: The use of any substance in a manner, situation, amount, or frequency that can cause harm to users or to those around them. For some substances or individuals, any use is considered misuse (e.g., underage drinking, heroin use).

Surgeon General’s Report on Alcohol, Drugs, and Health; 2016. At: addiction.surgeongeneral.com
Preferred Terms and Definitions

• **Substance Misuse Problems (Consequences):** Any health or social problem that results from substance misuse. Substance misuse problems may affect the substance user or those around them, and they may be acute (an argument or fight, a motor vehicle crash, an overdose) or chronic (a long-term substance-related medical, family, or employment problem, or chronic medical condition, such as cancer or liver disease).
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• **Substance Use Disorder:** A medical illness caused by repeated misuse of a substance or substances. A severe substance use disorder is commonly called an addiction.

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• **Recovery:** A process of change through which individuals improve their health and wellness, live a self-directed life, and strive to reach their full potential. Even individuals with severe substance use disorders can, with help, overcome them and regain health and social function. This is called *remission*. When these changes are voluntary, that is called being in *recovery*.
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- **Relapse:** The return to substance use after a significant period of abstinence. Relapse is common, and does not equate to treatment failure. According to NIDA, addiction is a chronic, relapsing and remitting brain disease.

Surgeon General’s Report on Alcohol, Drugs, and Health; 2016. At: [addiction.surgeongeneral.com](http://addiction.surgeongeneral.com)
What’s the big deal?
1 in 7 people will develop a substance use disorder at some point in their lives. 
Source: Kessler et al., 2005.
Substance Use Disorders in the U.S.

• **Alcohol Use Disorder:** Over half of the US population consumes alcohol (176M); 17M have an alcohol use disorder.

• **Tobacco Use Disorder:** Nearly 25% of the US population uses tobacco (67M); causes over 480,000 deaths per year.

• **Cannabis Use Disorder:** 22.2M Americans age 12 or older report cannabis use in past month; CUD is rapidly growing.

• **Stimulant Use Disorder:** 1.5M Americans have a stimulant use disorder (cocaine, amphetamines/methamphetamine).

• **Opioid Use Disorder:** Over 2M Americans have an OUD relating to Rx Opioids; another 0.8M relating to heroin; and now approximately 0.2M from fentanyl/synthetics.

SAMHSA: Substance Use Disorders; 2015. At: www.samhsa.gov/disorders/substance-use
Reasons for Concern

Table 1.2: Past Year Substance Use, Past Year Initiation of Substance Use, and Met Diagnostic Criteria for a Substance Use Disorder in the Past Year Among Persons Aged 12 Years or Older for Specific Substances: Numbers in Millions and Percentages, 2015 National Survey on Drug Use and Health (NSDUH)

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Drug Overdose Mortality

• In 2015, over 51,000 people died from drug overdoses in the United States
  – One every 11 minutes (4 more during this presentation)
  – Nearly 2/3 of those deaths involved prescription drugs
  – “Painkillers” (opioids) were involved in 75% of those deaths
• In Colorado, drug overdose deaths now number 869/yr (2015)
• Since 2002, more overdose deaths have involved Rx opioids than heroin, cocaine, and meth combined
• The problem knows no regional, gender, age, income, or other bounds: it is truly an epidemic (CDC: top four)

Colorado Rx Abuse Task Force data.
SAMSHA: NSDUH 2011 survey.
Overdose Deaths in the US: 2002-2014

Death rate per 100,000

- 0-4
- 4.1-8
- 8.1-12
- 12.1-16
- 16.1-20
- 20+

2002

US: 23,518 deaths
8.2 per 100,000
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Drug Overdose Death Rates in the US

![Graph showing drug overdose death rates in the US](image)

CDC WONDER data file, Nov 21, 2014; 63(46);1095.
Prescription Opioids: primary driver of Drug Overdose Deaths in United States in 2015

Number of Deaths

Drug or Drug Class

Jones et al. CDC/NCHS 2016.
Deaths are the Tip of the Iceberg
For every opioid overdose death in 2013 there were...

For every 1 death there are...

- 10 treatment admissions for abuse
- 32 emergency dept visits for misuse or abuse
- 130 people who abuse or are dependent
- 825 nonmedical users
## Costs of Substance Abuse in the U.S.

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$ 25,987 per second – cost to treat one person for one month of inpatient/residential treatment

Surgeon General’s Report on Alcohol, Drugs, and Health; 2016. At: [addiction.surgeongeneral.com](https://addiction.surgeongeneral.com)
Cost of Rx Opioid Abuse on the US Economy

Total Cost (2013)

$78.5 BILLION

- Medical Complications
  - $1.2 BILLION (1.5%)

- Substance Abuse Treatment
  - $3.2 BILLION (4.1%)

- Criminal Justice
  - $12.1 BILLION (15.4%)

- Lost Productivity*
  - $62.0 BILLION (79%)

*Productivity loss included mortality, unemployment/subemployment, and incarceration.
Investment in Interventions is Cost Effective (both Prevention and Treatment)

Every $1 spent on implementation of evidence-based interventions can have a benefit of $64.

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**Economics of Prevention**

The Washington State Institute for Public Policy developed a standardized model using scientifically rigorous standards to estimate the costs and benefits associated with various prevention programs. Benefit-per-dollar cost ratios for EBIIs ranged from small returns per dollar invested to more than $64 for every dollar invested. These estimates are illustrated below in Table 3.3.

**Table 3.3: Cost-Benefit of EBIs Reviewed by the Washington State Institute for Public Policy, 2016**

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<td>Raising Healthy Children/SSDP</td>
<td>$4.27</td>
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<td>Good Behavior Game</td>
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<td>LifeSkills Training</td>
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<td>Guiding Good Choices</td>
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<td>Positive Family Support/ Family Check Up</td>
<td>$0.62</td>
</tr>
<tr>
<td>Project Towards No Drug Abuse</td>
<td>$6.54</td>
</tr>
<tr>
<td>BASICS</td>
<td>$17.61</td>
</tr>
</tbody>
</table>

*Cost estimates are per participant, based on 2015 United States dollars.

Note: This is a general indication of the potential health and social value of EBIs. It is not possible to estimate specific cost-benefit for every EBI due to challenges in calculating accurate intervention effect sizes, the failure to document costs, the variation of methods used, and few mandates or incentives to complete this research. Reaching a consensus on standards for cost-benefit analyses and making them a routine part of prevention program evaluation could help policymakers choose EBIs that both prevent substance misuse and ensure that investments return benefits over the life course.

Investment in Interventions is Cost Effective (both Prevention and Treatment)

- Cost-Benefit Ratio for SUD Treatment is **11 : 1** in Health Care and Criminal Justice costs alone

Surgeon General’s Report on Alcohol, Drugs, and Health; 2016. At: addiction.surgeongeneral.com
Substance Use Disorder Treatment Gap: 90%

SAMHSA. National Survey on Drug Use and Health, 2011.
Physicians Authorized to Treat Addiction (Buprenorphine/Methadone)

Rate of Providers (per 100,000 people)

[Map showing the rate of providers across different states, with color coding to indicate the number of providers per 100,000 people.]

Relapse is Common – Not Desirable, but Not Equal to Failure

**COMPARISON OF RELAPSE RATES BETWEEN DRUG ADDICTION AND OTHER CHRONIC ILLNESSES**

- **Drug Addiction**: 40 to 60%
- **Type I Diabetes**: 30 to 50%
- **Hypertension**: 50 to 70%
- **Asthma**: 50 to 70%

Surgeon General’s Report on Alcohol, Drugs, and Health; 2016. At: addiction.surgeongeneral.com
How did we get here?
This problem is not “new”

- Opium (from the poppy plant) has been around since Sumerian times (Hul Gil – the plant of life)
- Alcohol, tobacco date from earliest recorded history
- Morphine was isolated in the early 1800s, mass produced by mid-1800s, root of “Soldier’s Disease” during/after the Civil War
- Aspirin and Heroin were created in 1897 (by the same chemist at Bayer, within a two week span); the latter was part of a major problem...
Welcome to 1897...
Within four years...
Problems and Responses...

- Patent Medicines: Pure Food and Drugs Act (1906)

- Heroin/Cocaine Addictions: Harrison Narcotics Act (1914), International Narcotics Control Conferences (1920’s - on)

- Percodan (1950) and Valium (1963) issues: Federal Controlled Substances Act (1971)
And then... The Letter:

ADDICTION RARE IN PATIENTS TREATED WITH NARCOTICS

To the Editor: Recently, we examined our current files to determine the incidence of narcotic addiction in 39,946 hospitalized medical patients who were monitored consecutively. Although there were 11,882 patients who received at least one narcotic preparation, there were only four cases of reasonably well documented addiction in patients who had no history of addiction. The addiction was considered major in only one instance. The drugs implicated were meperidine in two patients, Percodan in one, and hydromorphone in one. We conclude that despite widespread use of narcotic drugs in hospitals, the development of addiction is rare in medical patients with no history of addiction.

JANE PORTER
HERSHEL JICK, M.D.
Boston Collaborative Drug Surveillance Program

Waltham, MA 02154 Boston University Medical Center

The Response: A Tidal Wave

- A 1989 monograph for the National Institutes of Health, which asked readers to "consider the work" of Porter and Jick
- A 1990 article in Scientific American, where it was called "an extensive study"
- A 1995 article in Canadian Family Physician, where it was called "persuasive"
- A 2001 Time magazine feature, which said that it was a "landmark study" demonstrating that the "exaggerated fear that patients would become addicted" to opiates was "basically unwarranted"
- A 2007 textbook, "Complications in Regional Anesthesia and Pain Medicine," which said that it was "a landmark report" that "did much to counteract" fears about patients becoming addicted
- As of May 24, 2016, the Porter and Jick letter had been cited 901 times in scholarly papers, according to a Google Scholar search
The “Perfect Storm” of Opioids

• Over past 25 years: rapid increase in amount of opioids being prescribed and dispensed

• After “The Letter”, additional causes included:
  – Increased recognition of pain, under-treatment of pain
  – Pain as the “fifth vital sign”, JCAHO quality measure, etc.
  – Drug company advertising and promotion
  – Practitioners are not well trained in pain management, opioid pharmacology, and addiction
  – Drugs are very powerful, highly addictive if not used properly
  – Scamming, doctor/pharmacy shopping, black market for opioids
Growth in Opioid Sales/Prescribing/Use

Growth in Opioid Sales/Prescribing/Use

3.9-fold increase in quantity of opioids sold

259 million opioid prescriptions were dispensed at retail in 2013

...enough for every American adult to have a bottle of pills...every year!

Growth in Opioid Sales/Prescribing/Use

259 million opioid prescriptions were dispensed at retail in 2013\(^2\)
...enough for every American adult to have a bottle of pills...every year!

How does this problem start?
Americans are suffering from more chronic pain

Source: Health and Retirement Study, 1998-2010
Credit: Sarah Frostenson
Americans consume more opioids than any other country

Standard daily opioid dose for every 1 million people

United States
Canada
Germany
Denmark
Belgium
Austria
Switzerland
Australia
Holland
Spain
Luxembourg
Norway
Great Britain
Ireland
New Zealand
Sweden
Iceland
Israel
France
Slovenia
Portugal
Finland
Italy
Mauritius
Greece

Source: United Nations International Narcotics Control Board
Credit: Sarah Frostenson
Risk of continued opioid use increases at 4-5 days

Likelihood of continuing to use opioids

Number of days for initial opioid prescription

Source: Centers for Disease Control and Prevention
Credit: Sarah Frostenson
Sources of Opioids among Nonmedical Users

- Obtained free from friend or relative: 55%
- Prescribed by one doctor: 17.3%
- Bought from a friend or relative: 11.4%
- Took from a friend or relative without asking: 4.8%
- Got from drug dealer or stranger: 4.4%
- Other source: 7.1%
Sales of Opioid Pain Relievers and Nonmedical Opioid Use (2010-11)

<table>
<thead>
<tr>
<th>State</th>
<th>Sales of Opioid Pain Relievers, 2010.1</th>
<th>Nonmedical % Use of Prescription Pain Relievers in the Past Year by Persons Aged 12 or Older, 2010-2011.</th>
<th>Source: National Survey on Drug Use and Health</th>
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</thead>
<tbody>
<tr>
<td>Alabama</td>
<td>9.7</td>
<td>4.4</td>
<td></td>
</tr>
<tr>
<td>Alaska</td>
<td>8.2</td>
<td>5.3</td>
<td></td>
</tr>
<tr>
<td>Arizona</td>
<td>8.4</td>
<td>5.7</td>
<td></td>
</tr>
<tr>
<td>Arkansas</td>
<td>8.7</td>
<td>5.6</td>
<td></td>
</tr>
<tr>
<td>California</td>
<td>6.2</td>
<td>4.7</td>
<td></td>
</tr>
<tr>
<td>Colorado</td>
<td>6.3</td>
<td>6.0</td>
<td>#2 in U.S.</td>
</tr>
<tr>
<td>Connecticut</td>
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<tr>
<td>Delaware</td>
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<td>Georgia</td>
<td>6.5</td>
<td>3.8</td>
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<td>Illinois</td>
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<td></td>
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<tr>
<td>Wyoming</td>
<td>6.0</td>
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</tr>
<tr>
<td>National Rate</td>
<td>7.1</td>
<td>4.6</td>
<td></td>
</tr>
</tbody>
</table>

1 Kilograms of opioid pain relievers sold per 10,000 population, measured in morphine equivalents.
Majority of Heroin users in past year reported Nonmedical Use of Opioids before Heroin initiation (US, 2002-2004 and 2008-2010)

Jones, C.M. Drug Alcohol Depend 2013.

Office of the Governor
What is being done?
Risk Factors for Substance Misuse/Addiction

![Diagram of Risk Factors](image)

Source: NIDA

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University of Colorado
Boulder | Colorado Springs | Denver | Anschutz Medical Campus

Office of the Governor

Drugs, Brains, and Behavior: The Science of Addiction.
National Institute on Drug Abuse.
(accessed December 2016)
PRESCRIPTION DRUGS

Strategies and points of intervention for preventing misuse, abuse, and overdose, while safeguarding access to treatment.

**Strategies Legend**
- PDMPs
- PRRs
- Laws/Regulations/Policies
- Insurers/PBMs
- Clinical Guidelines

**PILL MILLS**
Interventions

**PROBLEM PRESCRIBING**
Interventions

**HOSPITALS / EMERGENCY DEPARTMENTS**
Interventions

**GENERAL PRESCRIBING**
Interventions

**PHARMACIES**
Interventions

**INSURERS / PBMs**
Interventions

**GENERAL PATIENTS / PUBLIC**
Interventions

**PEOPLE AT HIGH RISK FOR OVERDOSE**
Interventions

**NOTE:** What is presented here are the priority strategies that are likely to have the greatest impact. This is not an exhaustive list.
We also Know that…

**Prevention Works**
- Strong positive family ties, social connections, emotional health, and feelings of control help people avoid substance misuse.
- Evidenced-based prevention programs and policies are available for communities, schools, health care organizations, and other settings.

**Treatment is Effective**
- Substance use disorders can be effectively treated with behavioral therapies.
- Medications are also available for treating alcohol and opioid use disorders, and when combined with behavioral therapies, can effectively help people manage their symptoms and achieve recovery.

**People Recover**
- Many people are able to make significant changes in their lives and maintain remission through social networks and recovery-supportive environments.
- Recovery supports, including mutual aid groups (like Alcoholics Anonymous), recovery coaches, and peer recovery services, can help.
New Federal Initiatives

- **CDC:** calls Prescription Drug Abuse one of the top four epidemics facing the U.S.; issued new guideline for prescribing opioids for chronic pain

- **CMS:** recently said that they would “adopt” CDC guidelines for Medicare patients

- **FDA:** issued new Black Box Warnings for opioids (risk of OIRD and death); guidance for abuse deterrent formulations; Advisory Panel just recommended that Opana ER be removed from the market, and the manufacturer complied (without fighting the decision)

- **DEA:** tougher scheduling (Tramadol; Hydrocodone combination products); National Drug Take Back days (just had one April 29th); new rules allowing pharmacies and law enforcement to register as “reverse distributors”
New Federal Funding

- **CARA (Comprehensive Addiction and Recovery Act):** parity for substance abuse disorder treatment; funding for expansion of Medication Assisted Treatment (MAT)
  - Colorado received funds, using them to create “hub and spoke” model to increase provider capacity for offering MAT (one via Denver Health)

- **21st Century Cures Act:** additional funding for treatment, naloxone expansion, education, prevention
  - Colorado receiving formula funding of $7.8M/year for next 2 years
  - Primary use (80%): MAT treatment expansion
  - Other programs (20%): naloxone access, better referral systems, etc.
Key Takeaways

• Substance Use Disorders are common, affect us all in many ways (and at great cost)
• Prevention Works
• Treatment is Effective
• Recovery is Possible for Everyone
• Collaboration is Key
• More must be done to stem the tide of SUDs, and we have lots of expertise here in CO to do that
Questions?

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