The Opioid Epidemic:
Background and What Can I Do About It?
*From a Surgical Perspective*

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Opioids and us: Designed to fail

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AIDS, the Vietnam War, whatever your preferred scale for measuring horrific events, the numbers from the opioid crisis are as grave or worse. And, once again, it is the young who are dying. How we got to this point is an unbelievable story of corporate greed, government incompetence, regulatory commission overreach, and, unfortunately, physician ignorance.

Every one of us has contributed to this tragedy, and most of us still do. There are some easy first steps surgeons can take, but first let’s review the mistakes made that drove our country into addiction.

Malachi G. Sheahan III, MD, Medical Editor, is the Claude C. Craighead Jr. Professor and Chair, division of vascular and endovascular surgery, Louisiana State University Health Sciences Center, New Orleans.
THE OPIOID EPIDEMIC BY THE NUMBERS

IN 2016...

116 People died every day from opioid-related drug overdoses

11.5 m People misused prescription opioids

42,249 People died from overdosing on opioids

2.1 million People had an opioid use disorder

948,000 People used heroin

170,000 People used heroin for the first time

2.1 million People misused prescription opioids for the first time

17,087 Deaths attributed to overdosing on commonly prescribed opioids

19,413 Deaths attributed to overdosing on synthetic opioids other than methadone

15,469 Deaths attributed to overdosing on heroin

504 billion In economic costs

Sources: ¹ 2016 National Survey on Drug Use and Health, ² Mortality in the United States, 2016 NCHS Data Brief No. 293, December 2017, ³ CEA Report: The underestimated cost of the opioid crisis, 2017
1. The Opioid Epidemic – Past and Present
2. Postoperative Opioid Prescribing
3. Surgeons’ Roles in the Opioid Epidemic
In one year, drug overdoses killed more Americans than the entire Vietnam War did.
### 10 Leading Causes of Death by Age Group, United States - 2016

<table>
<thead>
<tr>
<th>Rank</th>
<th>1-4</th>
<th>5-9</th>
<th>10-14</th>
<th>15-24</th>
<th>25-34</th>
<th>35-44</th>
<th>45+</th>
<th>55-64</th>
<th>65+</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Short Gestation 3,927</td>
<td>Congenital Anomalies 433</td>
<td>Malignant Neoplasms 449</td>
<td>Suicide 436</td>
<td>Suicide 5,772</td>
<td>Suicide 7,366</td>
<td>Malignant Neoplasms 10,903</td>
<td>Heart Disease 78,610</td>
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<td>SIDS 1,500</td>
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<td>Malignant Neoplasms 431</td>
<td>Homicide 5,172</td>
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<td>Chronic Low Respiratory Disease 10,477</td>
<td>Diabetes Mellitus 131,002</td>
<td>Chronic Low Respiratory Disease 154,596</td>
<td>161,374</td>
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<tr>
<td>4</td>
<td>Maternal Pregnancy Comp. 1,402</td>
<td>Homicide 339</td>
<td>Homicide 139</td>
<td>Homicide 147</td>
<td>Malignant Neoplasms 1,431</td>
<td>Malignant Neoplasms 3,791</td>
<td>Suicide 7,030</td>
<td>Chronic Low Respiratory Disease 17,810</td>
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<td>Unintentional Injury 1,219</td>
<td>Heart Disease 118</td>
<td>Heart Disease 77</td>
<td>Congenital Anomalies 146</td>
<td>Heart Disease 3,445</td>
<td>Heart Disease 949</td>
<td>Homicide 3,309</td>
<td>Liver Disease 8,364</td>
<td>Diabetes Mellitus 14,295</td>
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<td>Placenta Cord. Membranes 341</td>
<td>Influenza &amp; Pneumonia 103</td>
<td>Chronic Low Respiratory Disease 68</td>
<td>Heart Disease 111</td>
<td>Congenital Anomalies 388</td>
<td>Liver Disease 925</td>
<td>Diabetes Mellitus 6,267</td>
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<td>Bacterial Sepsis 583</td>
<td>Septicemia 70</td>
<td>Influenza &amp; Pneumonia 48</td>
<td>Chronic Low Respiratory Disease 75</td>
<td>Congenital Anomalies 388</td>
<td>Liver Disease 925</td>
<td>Diabetes Mellitus 2,049</td>
<td>Cerebrovascular 12,310</td>
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<td>Respiratory Disease 488</td>
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<td>Circulatory System Disease 460</td>
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<td>Neonatal Hemorrhage 398</td>
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<td>Benign Neoplasms 31</td>
<td>Septicemia 31</td>
<td>Complicated Pregnancy 184</td>
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<td>Nephritis 5,650</td>
<td>Septicemia 30,405</td>
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National Vital Statistics System, National Center for Health Statistics, CDC.
# 10 Leading Causes of Injury Deaths by Age Group Highlighting Unintentional Injury Deaths, United States - 2016

<table>
<thead>
<tr>
<th>Rank</th>
<th>&lt;1</th>
<th>1-4</th>
<th>5-9</th>
<th>10-14</th>
<th>15-24</th>
<th>25-34</th>
<th>35-44</th>
<th>45-54</th>
<th>55-64</th>
<th>65+</th>
<th>Total</th>
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<tr>
<td>1</td>
<td>Unintentional Suffocation</td>
<td>1,023</td>
<td>Unintentional Drowning</td>
<td>425</td>
<td>Unintentional MV Traffic</td>
<td>384</td>
<td>Unintentional MV Traffic</td>
<td>455</td>
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<td>7,031</td>
<td>Unintentional Poisoning</td>
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<td>2</td>
<td>Homicide Unspecified</td>
<td>132</td>
<td>Unintentional MV Traffic</td>
<td>294</td>
<td>Unintentional Drowning</td>
<td>147</td>
<td>Suicide Suffocation</td>
<td>247</td>
<td>Unintentional Poisoning</td>
<td>499</td>
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<tr>
<td>3</td>
<td>Unintentional MV Traffic</td>
<td>68</td>
<td>Unintentional Suffocation</td>
<td>118</td>
<td>Unintentional Drowning</td>
<td>117</td>
<td>Suicide Suffocation</td>
<td>190</td>
<td>Unintentional Poisoning</td>
<td>403</td>
<td>Unintentional Poisoning</td>
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<tr>
<td>4</td>
<td>Homicide Other Spec., Unclassifiable</td>
<td>63</td>
<td>Unintentional MV Traffic</td>
<td>118</td>
<td>Unintentional Drowning</td>
<td>68</td>
<td>Homicide Firearm</td>
<td>4,553</td>
<td>Suicide Suffocation</td>
<td>4,510</td>
<td>Suicide Poisoning</td>
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<td>5</td>
<td>Undetermined Suffocation</td>
<td>60</td>
<td>Unintentional Fire/Burn</td>
<td>107</td>
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<td>35</td>
<td>Homicide Firearm</td>
<td>96</td>
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<td>2,100</td>
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<td>6</td>
<td>Undetermined Unspecified</td>
<td>38</td>
<td>Unintentional Drowning</td>
<td>96</td>
<td>Homicide Suffocation</td>
<td>82</td>
<td>Homicide Firearm</td>
<td>82</td>
<td>Suicide Poisoning</td>
<td>425</td>
<td>Suicide Poisoning</td>
</tr>
<tr>
<td>7</td>
<td>Unintentional Drowning</td>
<td>36</td>
<td>Homicide Firearm</td>
<td>64</td>
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<td>35</td>
<td>Suicide Suffocation</td>
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<td>Suicide Poisoning</td>
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<tr>
<td>8</td>
<td>Homicide Suffocation</td>
<td>19</td>
<td>Homicide Other Spec., Unclassifiable</td>
<td>64</td>
<td>Unintentional Drowning</td>
<td>39</td>
<td>Suicide Suffocation</td>
<td>340</td>
<td>Suicide Suffocation</td>
<td>340</td>
<td>Unintentional Poisoning</td>
</tr>
<tr>
<td>9</td>
<td>Adverse Effects</td>
<td>16</td>
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<td>289</td>
<td>Unintentional Poisoning</td>
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<td>Unintentional Poisoning</td>
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<td>10</td>
<td>Unintentional Poisoning</td>
<td>16</td>
<td>Unintentional Drowning</td>
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<td>Unintentional Poisoning</td>
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<td>Unintentional Poisoning</td>
<td>325</td>
<td>Homicide Firearm</td>
<td>350</td>
<td>Homicide Poisoning</td>
</tr>
</tbody>
</table>

National Vital Statistics System, National Center for Health Statistics, CDC.
How did we get here...
How Did This Happen?

1. **1980’s-90’s**: Movement toward aggressive pain management with opioids

2. **1984**: Purdue Pharma introduces MS Contin

3. **1996**: Purdue releases Oxycontin - $1 billion/year drug (>35 billion total)
   - 2007: Purdue and three executives plead guilty to misdemeanor charge of false branding (fined $634,000,000)

4. **1998**: VA and Joint Commission – Pain as “the 5th Vital Sign”
The Letter that Launched a Billion Rxs


ADDITION 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 patients1 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,2 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.

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Boston University Medical Center
Waltham, MA 02154

Prescription Opioids 1999-2010


Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report, November 1, 2011
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
PAIN ASSESSMENT TOOL

0 1-3 4-6 7-9 10

No Pain  Mild  Moderate  Severe  Very Severe  Worst Pain Possible

0 1 2 3 4 5 6 7 8 9 10
Press-Ganey Patient Satisfaction

**Pain Management**

During this hospital stay, how often did the hospital staff do everything they could to help you with your pain?

<table>
<thead>
<tr>
<th>Percent Top Box</th>
<th>2011Q2</th>
<th>2011Q3</th>
<th>2011Q4</th>
<th>2012Q1</th>
<th>2012Q2</th>
<th>2012Q3</th>
<th>2012Q4</th>
<th>2013Q1</th>
</tr>
</thead>
<tbody>
<tr>
<td>UCI</td>
<td>72.08</td>
<td>77.49</td>
<td>70.21</td>
<td>73.22</td>
<td>77.4</td>
<td>76.8</td>
<td>74.1</td>
<td>80</td>
</tr>
<tr>
<td>Avatar/Press-Ganey</td>
<td>76.57</td>
<td>77.41</td>
<td>77.81</td>
<td>76.58</td>
<td>76.7</td>
<td>75.6</td>
<td>75.8</td>
<td>76</td>
</tr>
</tbody>
</table>
Take Home Message:

It is unacceptable to undertreat pain
Overdose Deaths in US

3 Waves of the Rise in Opioid Overdose Deaths

- Wave 1: Rise in Prescription Opioid Overdose Deaths
- Wave 2: Rise in Heroin Overdose Deaths
- Wave 3: Rise in Synthetic Opioid Overdose Deaths

Figure 1. Percentage of the Total Heroin-Dependent Sample That Used Heroin or a Prescription Opioid as Their First Opioid of Abuse.
What About Here in the State of Virginia? (I mean at least we aren’t as bad as West Virginia, right?)
2017 Overdose Deaths

The New York Times, Source: The Centers for Disease Control and Prevention
Overdose Deaths in Virginia (2016)
Overdose Deaths in West Virginia (2016)

Number of Opioid Related Overdose Deaths in West Virginia

Source: CDC WONDER  *Data unreliable
There’s no simple fix...
Prevention/Education
- Public health campaigns
- Public school initiatives
- CME in pain and addiction
- Medical student/resident education
- Tele-consults for pain and addiction
- Novel analgesic development

Supply Reduction
- Law enforcement
  - Limiting prescribing (7 days)
  - PMP
  - Partial fills
  - E-prescribing
  - Medication disposal
  - XR-opioid restriction

SUD Treatment
- Inc. treatment beds
- Expanding treatment in jails/prisons
- ED screening
- Workforce development
- Reducing coverage barriers

Harm Reduction
- Naloxone
- Needle exchanges
- Reducing needle purchasing barriers
- Safe injection facilities?
1. We were overprescribing opioids
2. We now have an epidemic of overdose deaths
3. Deaths now are from non-prescribed opioids
4. Most people start with prescribed opioids
5. A multifaceted, comprehensive approach is needed
1. The Opioid Epidemic – Past and Present
2. Postoperative Opioid Prescribing
3. Surgeons’ Roles in the Opioid Epidemic
How often do people get addicted to opioids after surgery...
New Persistent Opioid Use After Minor and Major Surgical Procedures in US Adults

Chad M. Brummett, MD; Jennifer F. Wajee, MD, MPH, MS; Jenna Goesling, PhD; Stephanie Moser, PhD; Paul Lin, MS; Michael J. Englesbe, MD; Amy S. Bohnert, PhD, MHSc; Sachin Kheterpal, MD, MBA; Brahmajeet K. Itlalamotlu, MD, MPH
Persistent Opioid Use at 90-180 Days:
- Minor Surgery: 5.9%
- Major Surgery: 6.5 %
- Nonoperative Controls: 0.4%

Risk Factors:
- Preoperative Tobacco Use: aOR 1.35
- Alcohol and Drug Use Disorders: aOR 1.34
- Mood Disorders: aOR 1.15
- Anxiety: aOR 1.25
- Preoperative Pain Disorders: aOR 1.22-1.57
- >300 MME: aOR 1.14

Persistent Use After Surgery

5-13% of opioid naïve patients develop persistent use after prescribed opioids for surgery

<table>
<thead>
<tr>
<th>Study</th>
<th>N</th>
<th>% chronic users</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alam 2012</td>
<td>390,000</td>
<td>7</td>
<td>On opioids 1 year after surgery</td>
</tr>
<tr>
<td>Deyo 2016</td>
<td>536,000</td>
<td>5</td>
<td>&gt;5 refills subsequent year</td>
</tr>
<tr>
<td>Johnson 2016</td>
<td>59,000</td>
<td>13</td>
<td>New script 90-180 days after surgery</td>
</tr>
<tr>
<td>Brummet 2017</td>
<td>55,000</td>
<td>6</td>
<td>New script 90-180 days after surgery</td>
</tr>
<tr>
<td>Jiang 2017</td>
<td>79,000</td>
<td>9</td>
<td>On opioids 90 days after surgery</td>
</tr>
<tr>
<td>Shah 2017</td>
<td>1,295,000</td>
<td>5</td>
<td>On opioids 1 year after surgery</td>
</tr>
</tbody>
</table>
The duration of first prescription matters...
N=1,294,247

Persistent Opioid Use at 1 Year:
1 or more days: 6%
8 or more days: 13.5%
Received a 2\textsuperscript{nd} Rx: 1 in 7 people

Persistent Opioid Use at 3 Years:
1 or more days: 2.9%

Largest Increases in Probability:
5\textsuperscript{th} and 31\textsuperscript{st} days on opioids
Receipt of a 3\textsuperscript{rd} Prescription
700 MME cumulative dose
First Rx of 10- and 30-days supplies
Initiated with XR-opioid (27% at 1 year)

How often are opioids unused...
Prescription Opioid Analgesics Commonly Unused After Surgery
A Systematic Review

Mark C. Bicket, MD; Jane J. Long, BS; Peter J. Pronovost, MD, PhD; G. Caleb Alexander, MD, MS; Christopher L. Wu, MD

Figure. Prevalence of Unused Opioids Prescribed After Surgery

Patients with Unused Opioids (%): 67-92%
Unused Tablets (%): 42-71%
Mean Unused Tablets (N): 5-20 tablets
Storage Location
Medicine cabinet or box: 54-70%
Wardrobe or cupboard: 21-26%
Unlocked location: 73-77%

Disposal or Plan for Disposal
4-30%

FDA-Approved Plan for Disposal
4-9%
1. Opioid exposure perioperatively is a high risk time for:
   - New cases of persistent opioid use
   - Relapse to addiction

2. Duration of initial prescription (opioid exposure) is associated with persistent use

3. Low rates of safe storage and disposal of opioids
So what can we do about it...
1. The Opioid Epidemic – Past and Present
2. Postoperative Opioid Prescribing
3. Surgeons’ Roles in the Opioid Epidemic
Prescribing opioids for our patients has risks for them:

• People who undergo general surgical operations (breast surgery, cholecystectomy) have a relative risk 2-3 X higher than the general population of becoming chronic opioid users

• 5-13% of opioid naïve surgical patients become chronic users after prescribed opioids for surgery

The pills our patients don’t use can be used by others:

• Diversion: 71% of users get drugs by diversion
Risk Mitigation for Sober or High-Risk People

1. Have discussion before surgery
2. Allow patient to share in decision-making re: opioids
3. Use lowest effective doses; maximize non-opioids
4. Involve family/support person
   - Relapse prevention plan
   - Handle/store opioids
5. Instruct pt to inform sponsor/recovery network/therapist/doctor
6. Schedule close follow up/give short Rx
   - Address craving, recovery plan, etc. at this visit
Consider Nonnarcotic Alternatives

- Increasing data supporting equal if not better efficacy of acetaminophen/Ibuprofen compared to acetaminophen/opioid for acute pain control

**Effect of a Single Dose of Oral Opioid and Nonopioid Analgesics on Acute Extremity Pain in the Emergency Department**

A Randomized Clinical Trial

Andrew K. Chang, MD, MS; Polly E. Bijur, PhD; David Esses, MD; et al

Use the Lowest Effective Dose

Guideline for Discharge Opioid Prescriptions after Inpatient General Surgical Procedures

Maureen V Hill, MD, Ryland S Stucke, MD, Sarah E Billmeier, MD, MPH, Julia L Kelly, MS, Richard J Barth Jr, MD, FACS

• 333 (234 after exclusions) patients who underwent common general surgery procedures were studied
• Amount of pain medicine and day of discharge reviewed
• Questionnaires regarding post-operative pain control and medication utilization mailed to and filled out by 210/234 (89.7%) included patients
Prescription guidelines to satisfy 85% of patients’ home opioid usage

<table>
<thead>
<tr>
<th>Discharge Date</th>
<th>Number toPrescribe</th>
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<tbody>
<tr>
<td>POD = 1</td>
<td>15</td>
</tr>
<tr>
<td>POD ≥ 2</td>
<td></td>
</tr>
<tr>
<td>Pills used on</td>
<td></td>
</tr>
<tr>
<td>day prior to DC</td>
<td></td>
</tr>
<tr>
<td>0 pills</td>
<td>0</td>
</tr>
<tr>
<td>1 - 3 pills</td>
<td>15</td>
</tr>
<tr>
<td>≥ 4 pills</td>
<td>30</td>
</tr>
</tbody>
</table>
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6. Schedule close follow up/give short Rx
   - Address craving, recovery plan, etc. at this visit
Questions...