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The Financial Toll of the Opioid Epidemic

Toward a Cost-Effective Model for Treating Pain

Danesh Mazloomdoost, MD
Medical Director


optimized

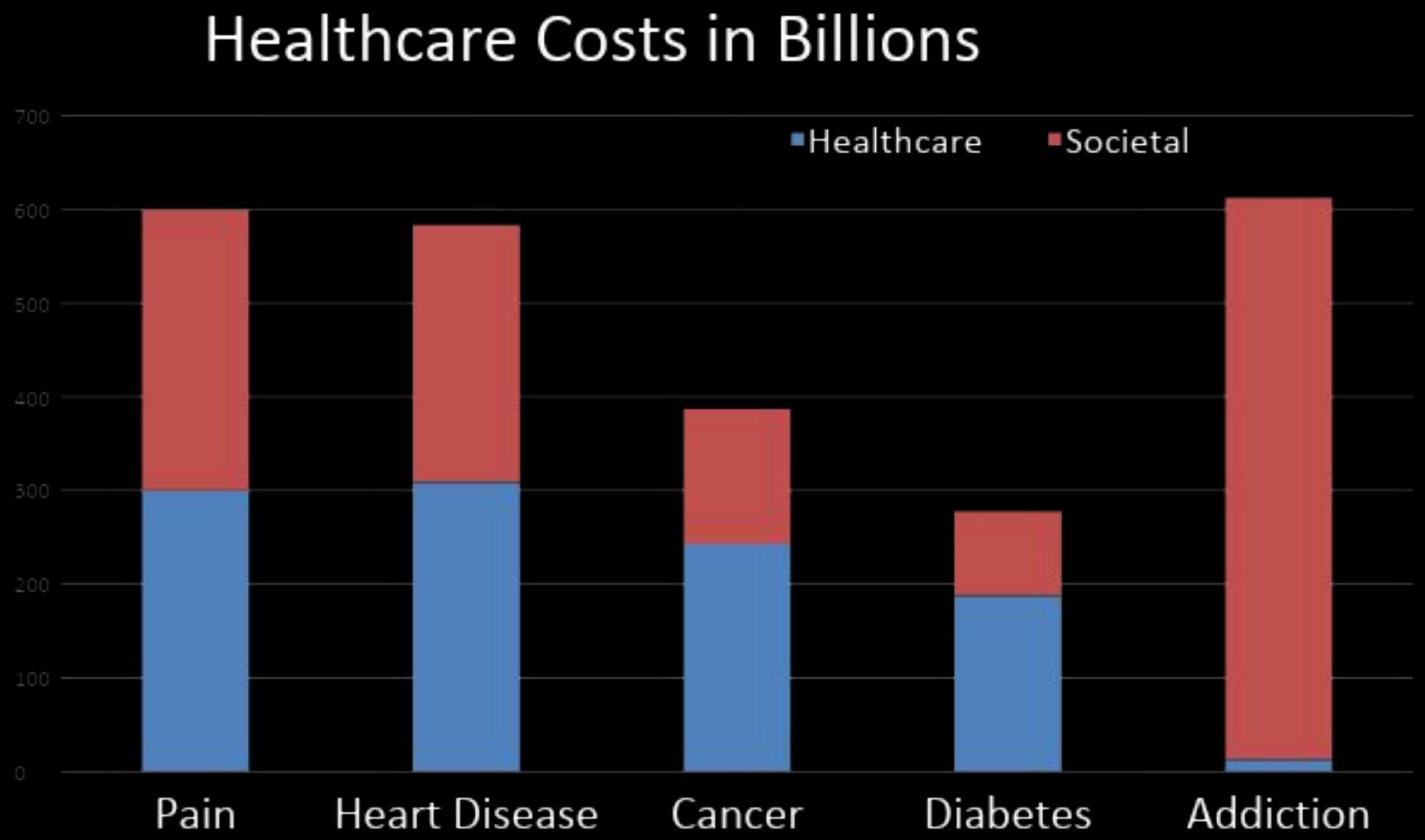
America's total annual healthcare bill is more than ...

$3 trillion

which is more than the next ten countries COMBINED:

Japan, Germany, France, China, the U.K., Italy,
Canada, Brazil, Spain, and Australia.

from America's Bitter Pill *by Steven Brill*



Gaskin DJ J Pain. 2012 Aug;13(8):715-24.
https://www.cdcfoundation.org/pr/2015/heart-disease-and-stroke-cost-america-nearly-1-billion-day-medical-costs-lost-productivity
https://www.diabetes.org/about-us/statistics/cost-diabetes
Bradley J Natl Cancer Inst. 2008 Dec 17;100(24):1763-70.
Principles of Drug Addiction Treatment: A Research-Based Guide (Third Edition) NIDA 2018

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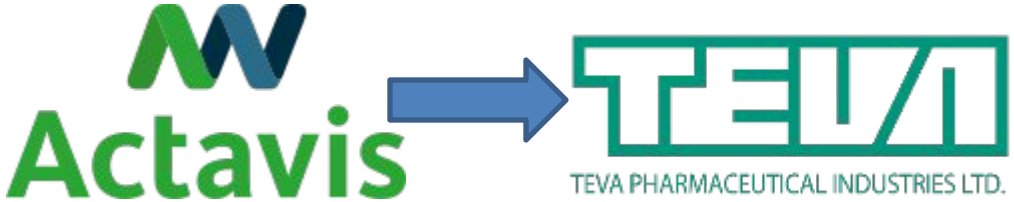
Pharmaceuticals

$10,000,000,000
from opioids in 2015



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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[1] 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.

JANE PORTER
HERSHEL JICK, M.D.
Boston Collaborative Drug Surveillance Program
Waltham, MA 02154 Boston University Medical Center

1. Jick H, Miettinen OS, Shapiro S, Lewis GP, Siskind Y, Slone D. Comprehensive drug surveillance. JAMA. 1970; 213:1455-60.
2. Miller RR, Jick H. Clinical effects of meperidine in hospitalized medical patients. J Clin Pharmacol. 1978; 18:180-8.

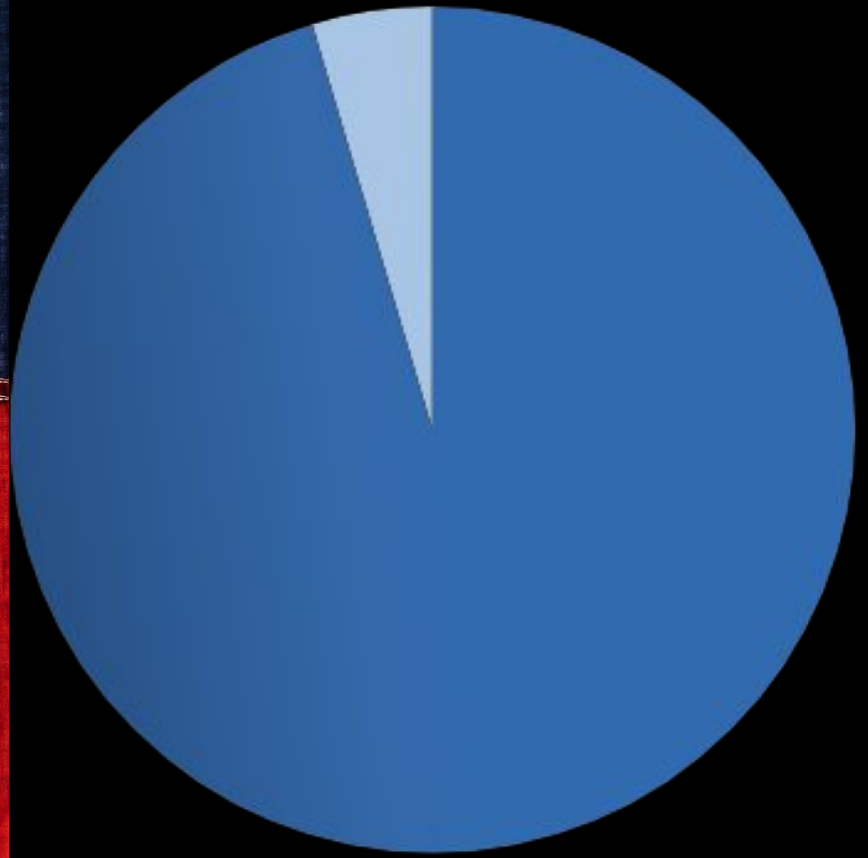
NEJM 1980 Jan 10; 302(2):123

TOP 10 Medications

1.	Hydrocodone	PAIN
2.	Zocor	Cholesterol
3.	Lisinopril	Hypertension
4.	Synthroid	Thyroid
5.	Norvasc	Hypertension

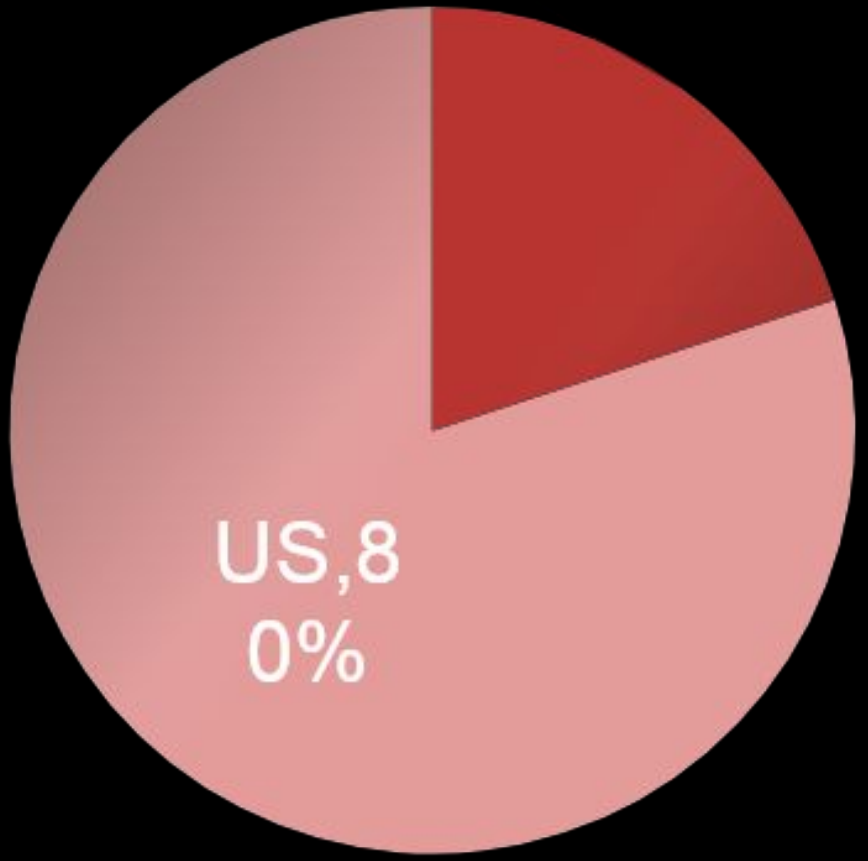
https://khn.org/news/graphic-opioid-painkiller-is-top-prescription-in-10-states/

Population



Opiate Consumption

Worl
d,20
%



Manchikanti L, Singh A. Therapeutic opioids: a ten-year perspective on the complexities and complications of the escalating use, abuse, and nonmedical use of opioids. Pain Physician. 2008 Mar;11(2 Suppl):S63-88. PMID: 18443641.

Overdose deaths per 100,000 people, 2003-2014

CDC 2016

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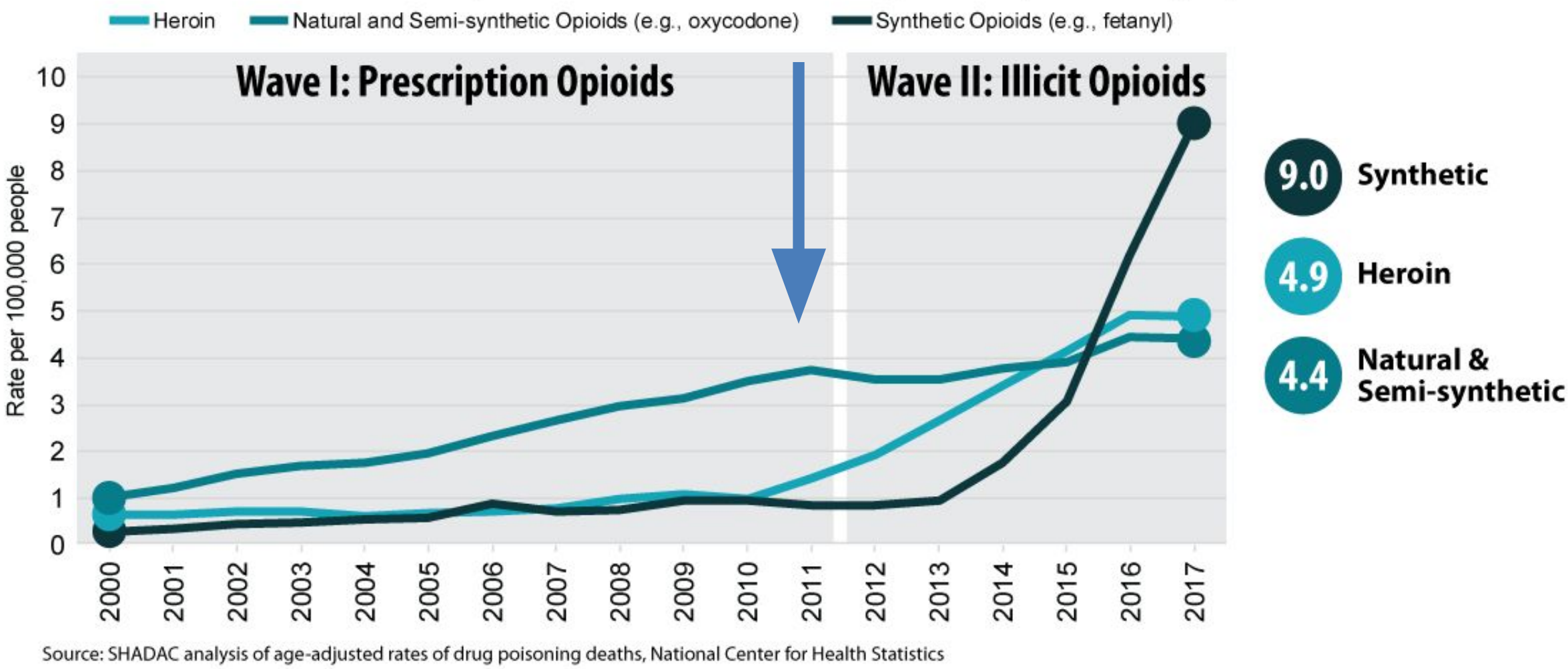
National Rates of Opioid Overdose Deaths per 100,000 People, 2000-2017



Source: SHADAC analysis of age-adjusted rates of drug poisoning deaths, National Center for Health Statistics

https://www.shadac.org/resource-opioid-epidemic-united-states

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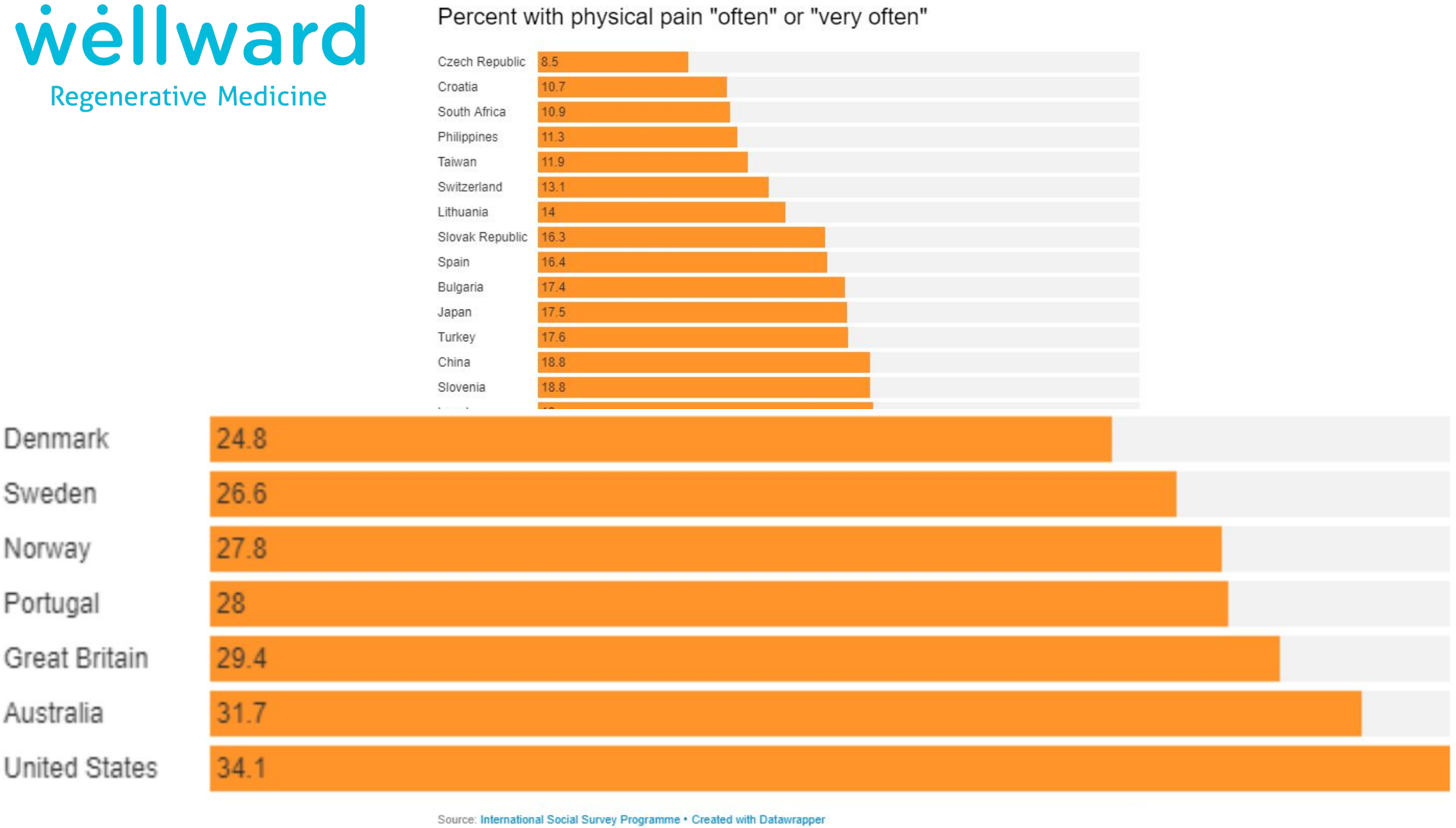

https://www.theatlantic.com/health/archive/2017/12/america-experiences-more-pain-than-other-countries/548822/

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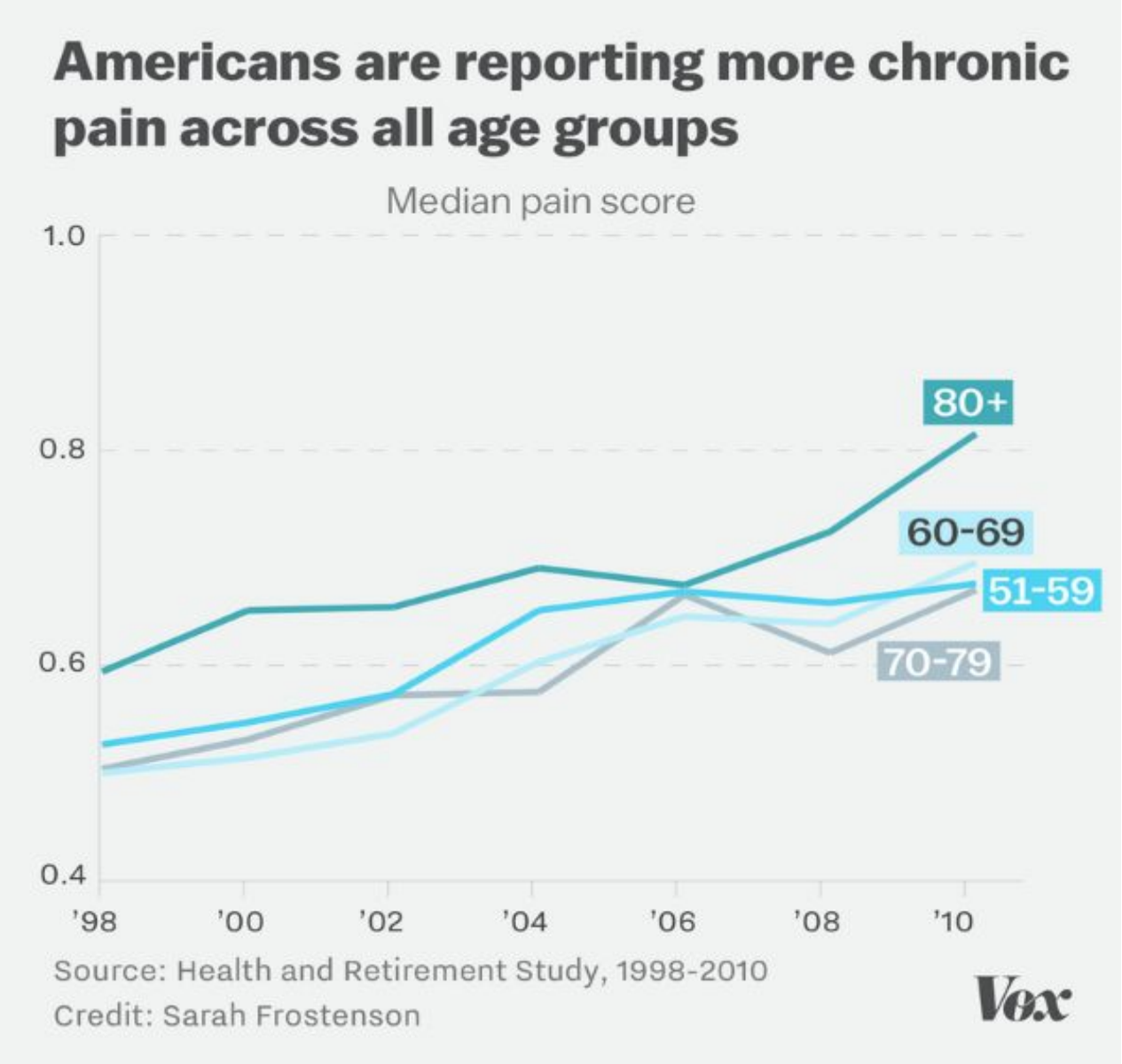
Americans are reporting more chronic pain across all age groups
Median pain score
1.0
0.8
0.6
0.4
80+
60-69
51-59
70-79
'98
'00
'02
'04
'06
'08
'10
Source: Health and Retirement Study, 1998-2010
Credit: Sarah Frostenson
Vox

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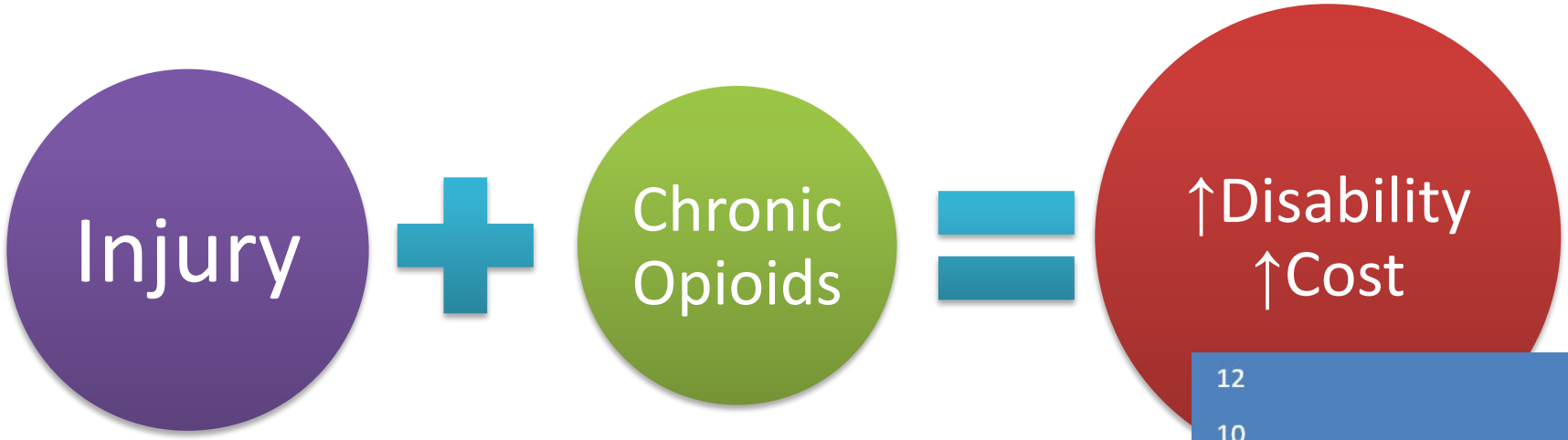
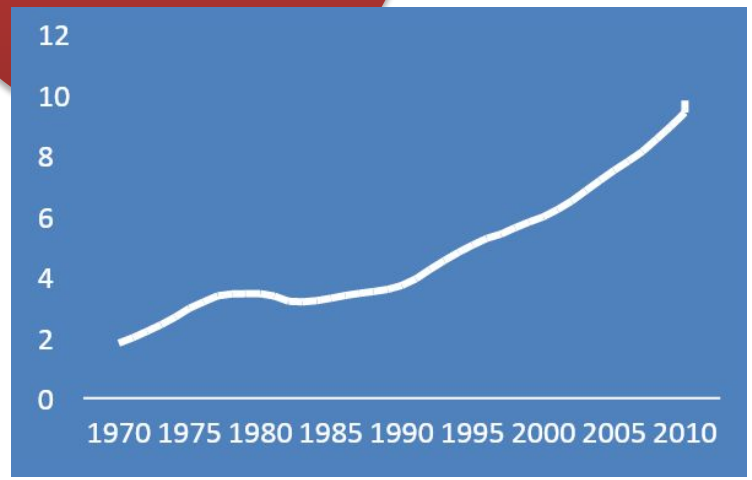
Workman's Compensation Data





Annual Statistical Report on the Social Security Disability Insurance Program, 2011

Xuguang GT Journal of Occup and Environ Med, 2012, Vol.54(4), p.439-444
Webster, BS et al. SPINE Volume 32, Number 19, pp 2127–2132 2007
Volinn E, Pain. 2009 Apr;142(3):194-201. doi: 10.1016/j.pain.2008.12.017. Epub 2009 Jan 31.

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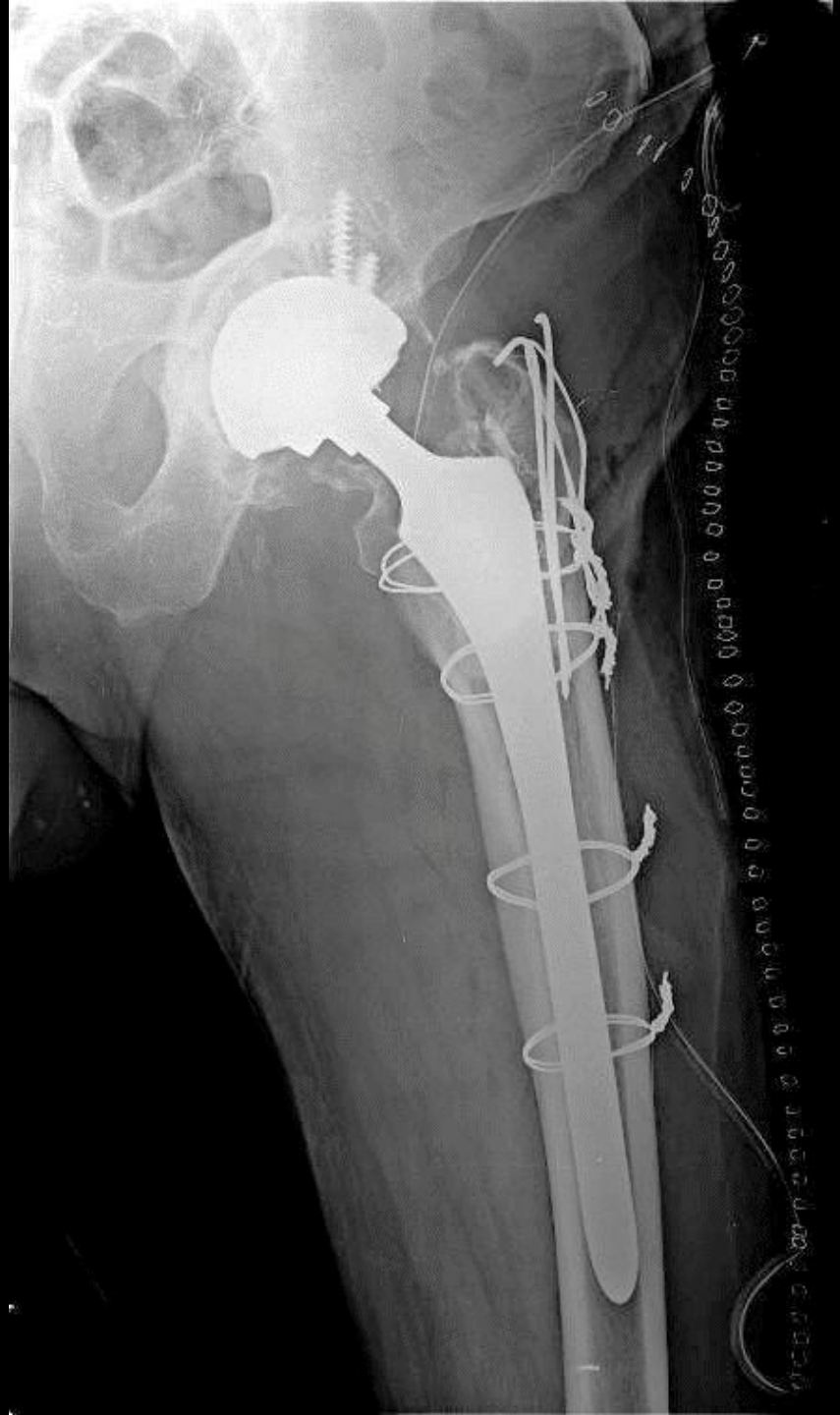

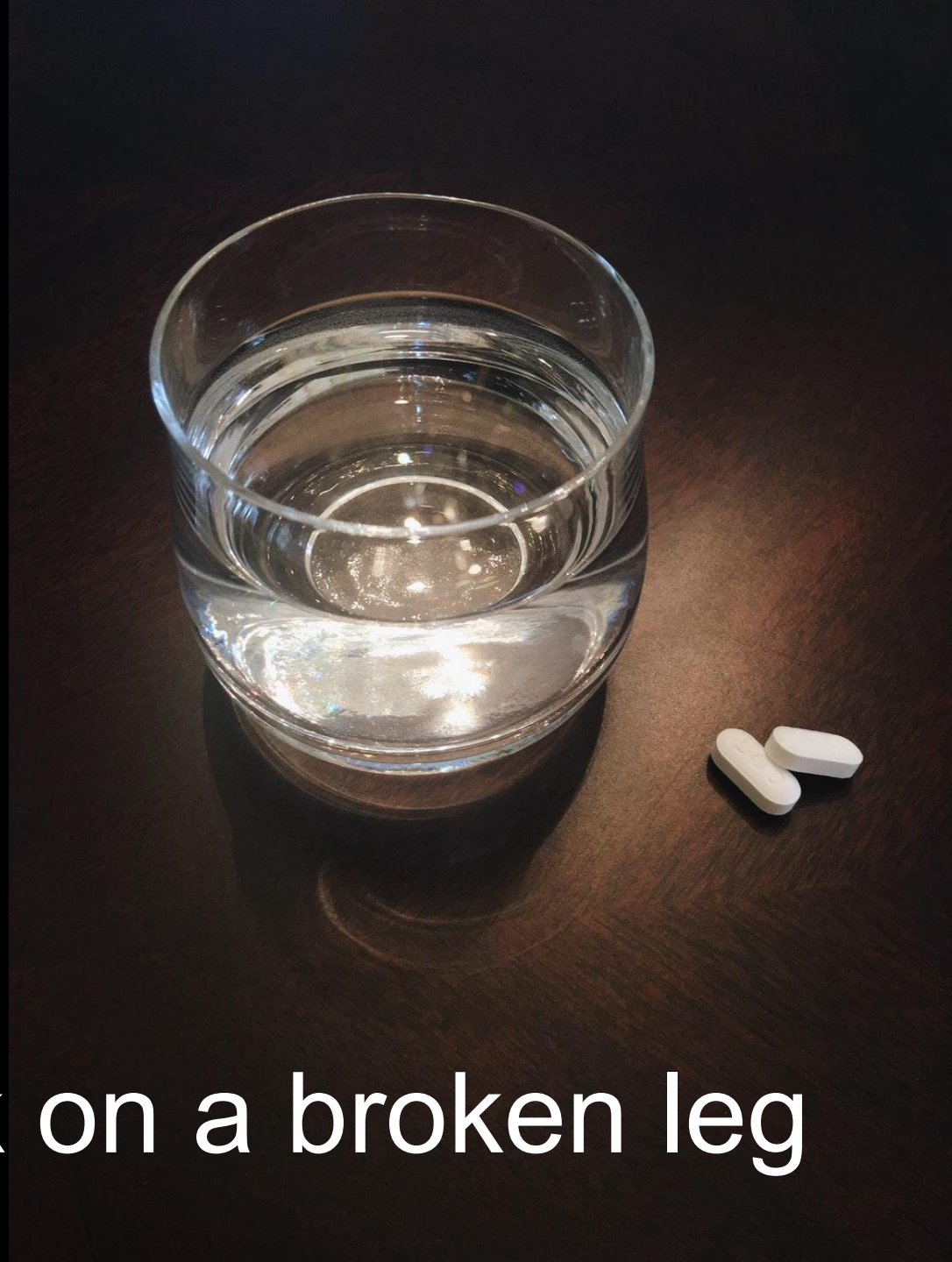

walk on a broken leg

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Unspoken Tolls of Opioids

- Immune: Inc. Cancer relapse (Exadaktylos 2006)
- Endocrine: Reduced Testosterone (Rajagopal 2004)
- CVS: Inc. Vascular disease (Carman 2011)
- Ortho: Inc. Fall risk (Solomon 2010)
- Trauma: Inc. accidents/disability, return to work (Hayes 2020)
- Neurologic: Inc. rates of dementia (Dublin 2015)
- GI: Reduced motility, Length of Stay (Kwong 2010)
- Weight: Inc. sugar intake and obesity (Mysels 1999)
- Psych: Inc. Mood disorders (Sullivan 2010)

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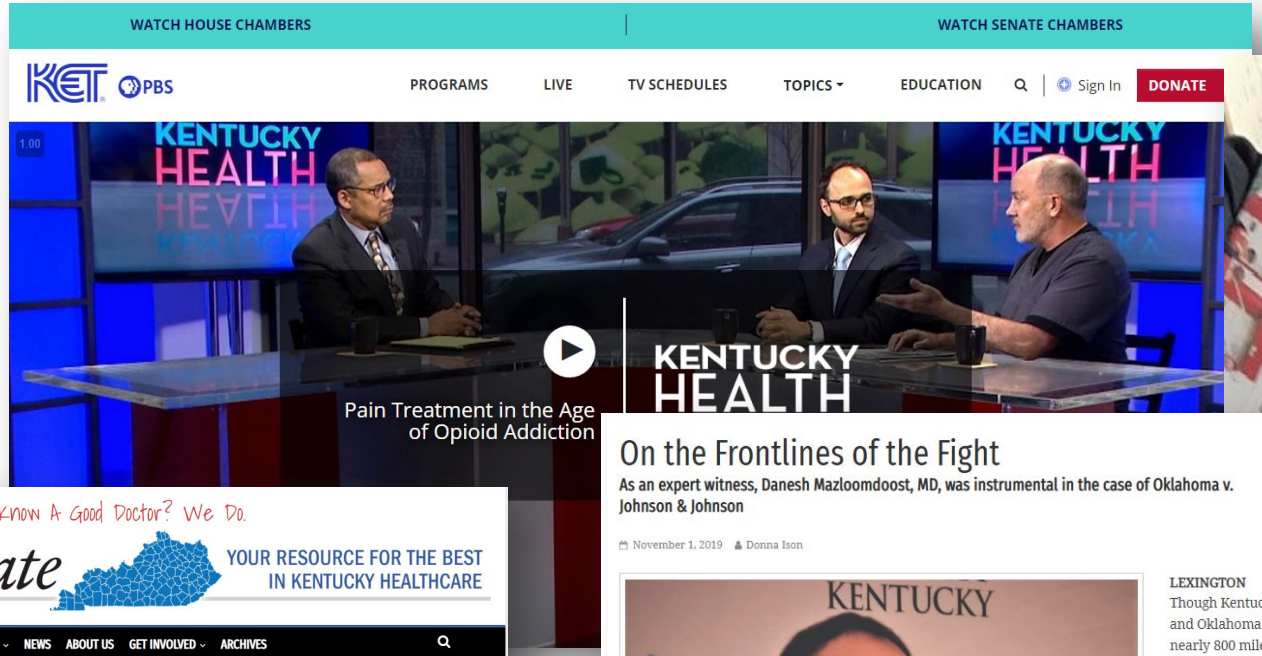
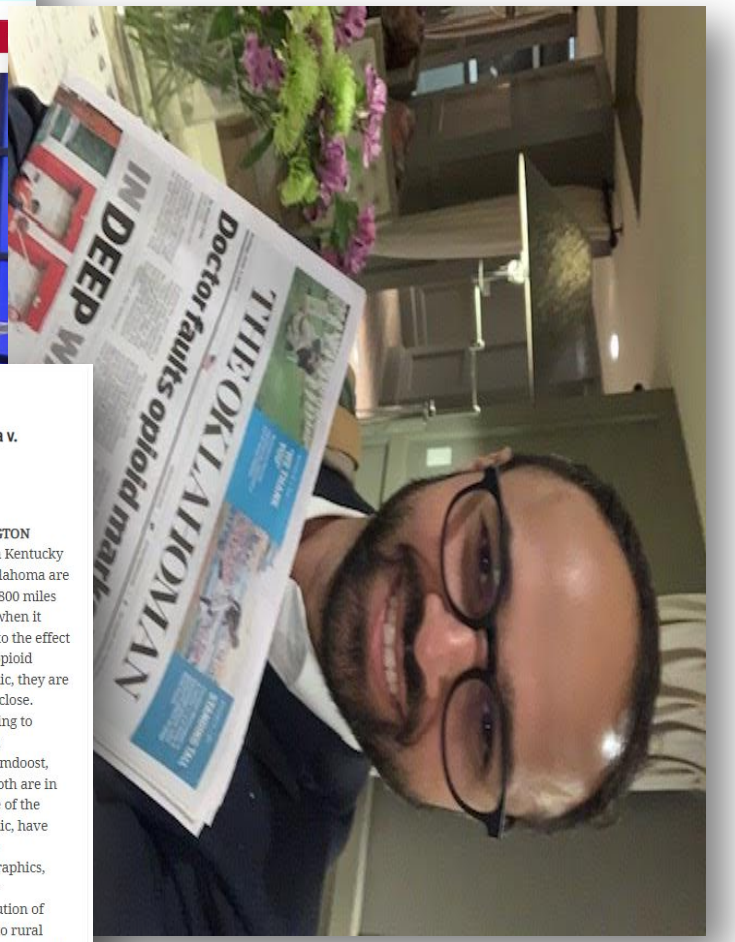
Wellward vs. Opioid Industry





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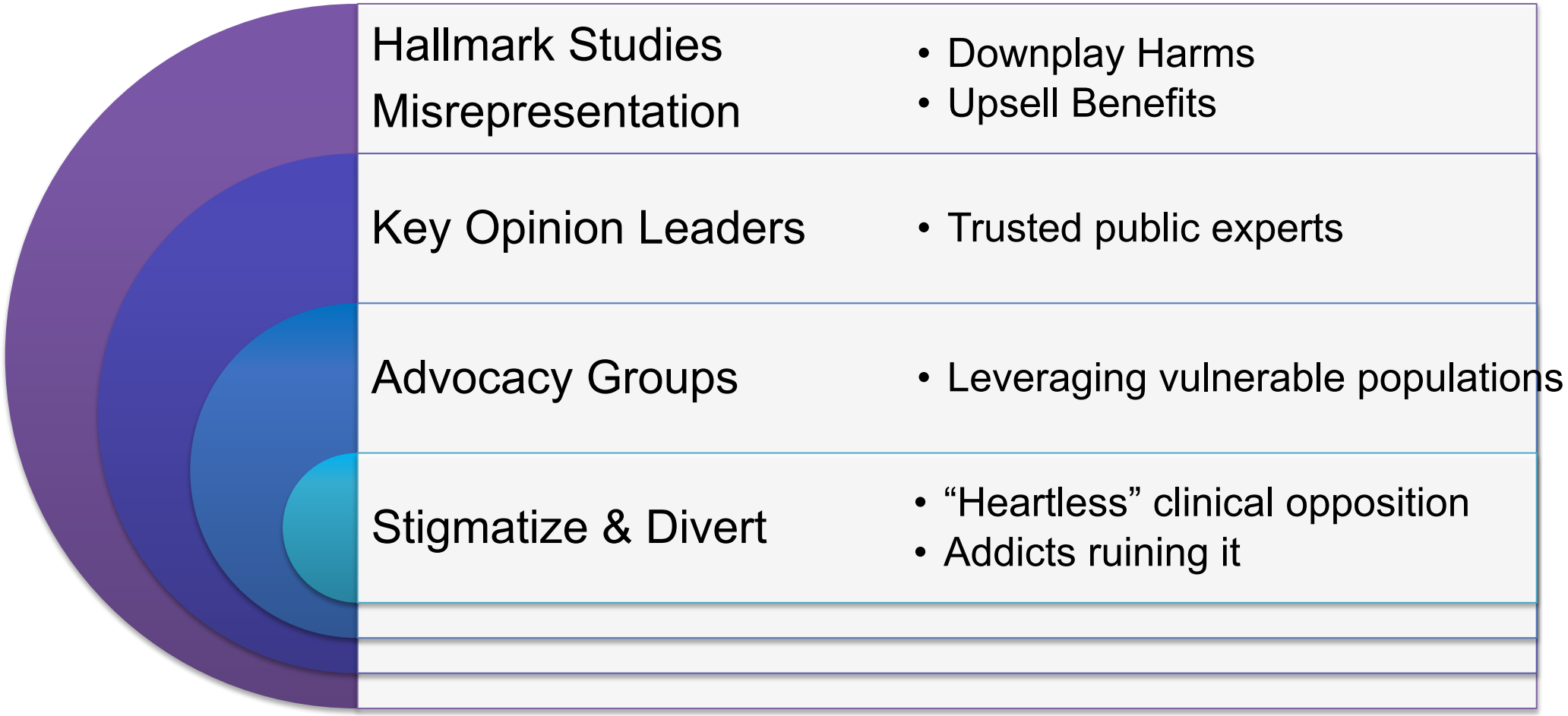
Systematic Plan to Promote Opioids



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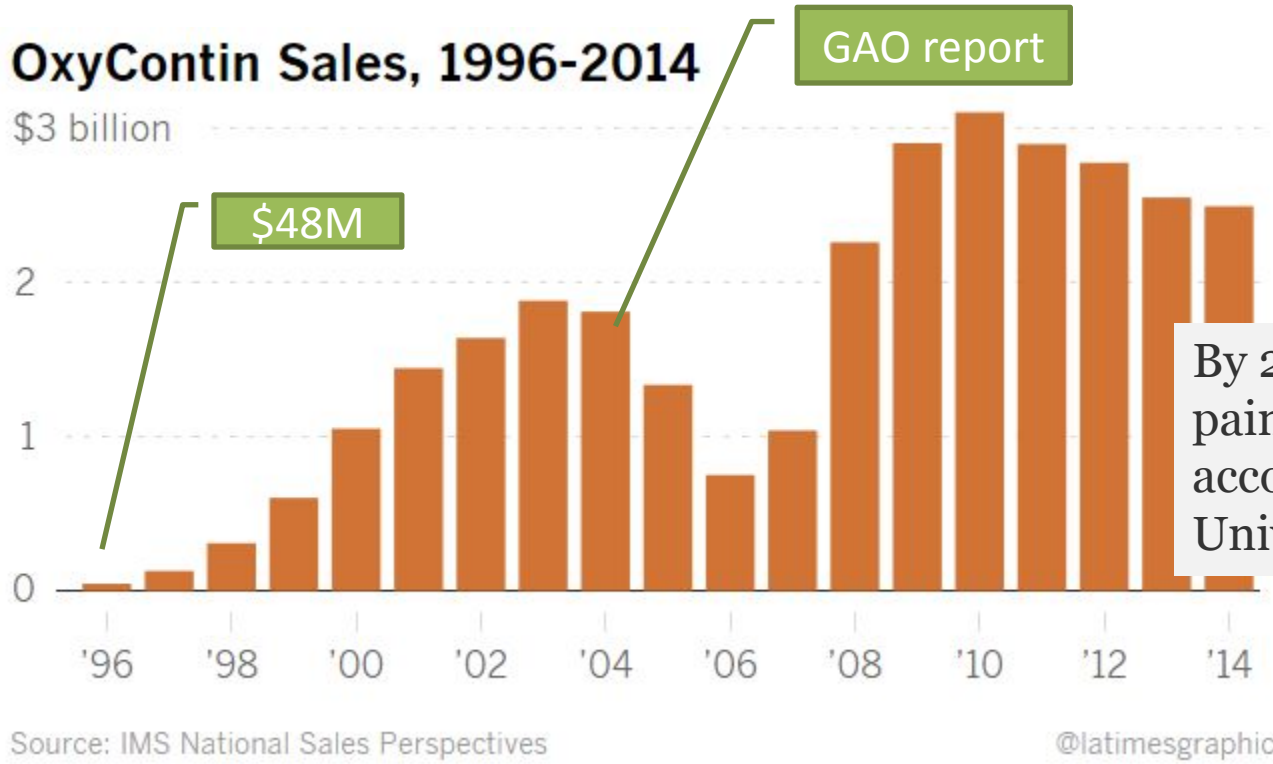
OxyContin

"We do not want to niche OxyContin just for cancer pain," a marketing executive (1995).



By 2010, 1 of 5 doctor's visits for pain resulted in an opioid, according to a Johns Hopkins University study.

>$31 billion drug

http://www.latimes.com/projects/oxycontin-part1/

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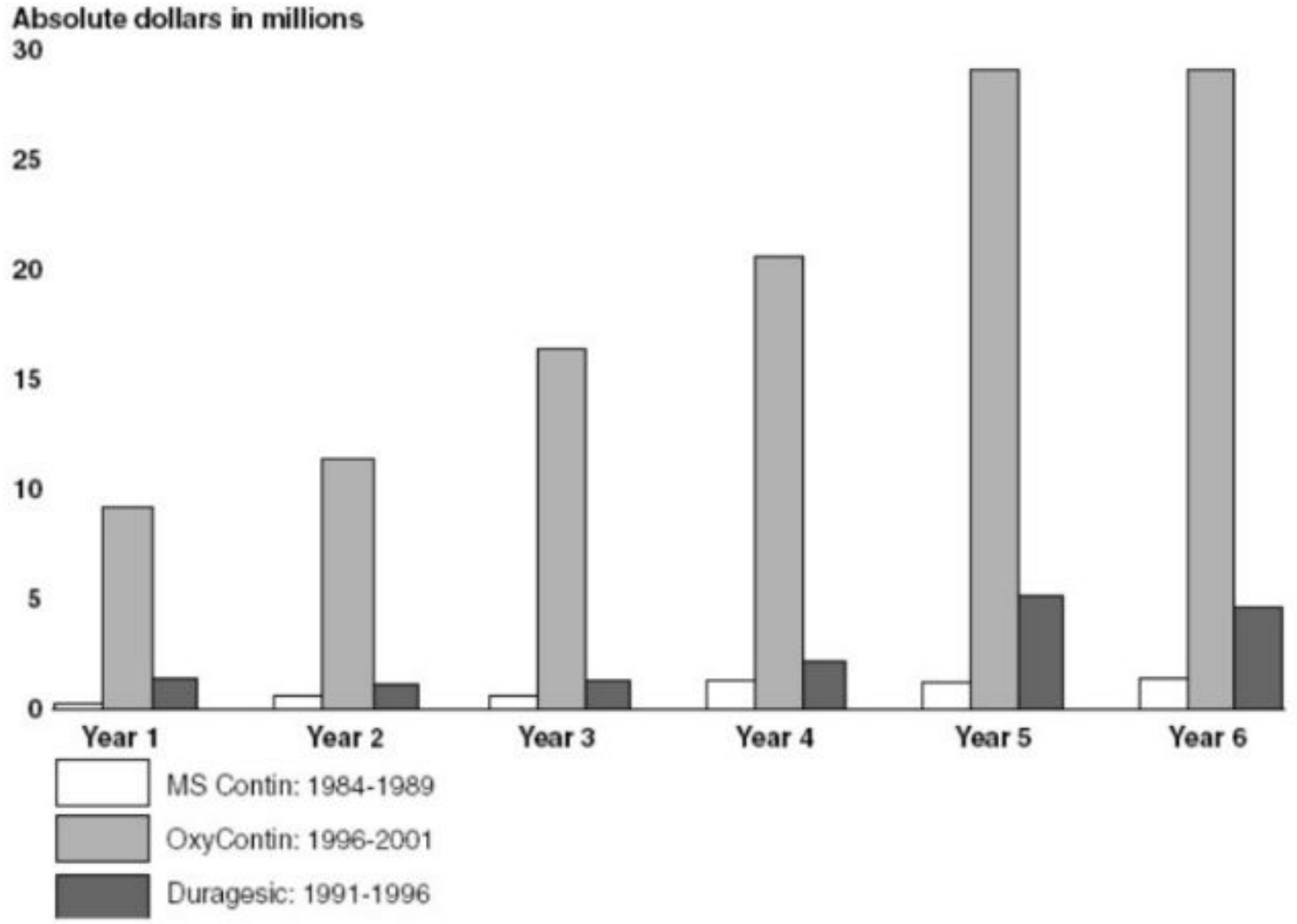
Dollars Spent Marketing OxyContin (1996-2001)

Figure 1: Promotional Spending for Three Opioid Analgesics in First 6 Years of Sales



Source: United States General Accounting Office: Dec. 2003, "OxyContin Abuse and Diversion and

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OxyContin Rx for non-malignant pain, ↑1000% (1997-2002)

by 2003, 50% of physicians prescribing OxyContin were primary care physicians

2001 Purdue Rep bonuses up to $240,000 / yr

TABLE 1—Distribution of OxyContin, Oxycodone (Excluding OxyContin), and Hydrocodone per 100 000 Population: Virginia, West Virginia, and Kentucky, 2000

	Distribution in Grams per 100 000 Population		
State and County	OxyContin	Oxycodone (Excluding OxyContin)	Hydrocodone
Kentucky			
Cumberland	22 113	1 486	8 148
Perry	20 996	6 145	27 413
Harlan	19 359	3 121	10 141
Leslie	18 221	4 017	16 925
Whitley	13 438	3 410	19 532
Greenup	13 222	5 151	44 872
McCreary	12 573	3 026	12 996
Clinton	12 517	2 911	14 892
Bell	11 739	3 118	26 037
Clay	11 563	3 260	21 093
US average	3 750	1 761	5 083

Source. Office of Diversion Control, Drug Enforcement Administration.[67]
Note. Data are for the counties or independent cities with the highest quantities of opioids (in grams) prescribed in each of the 3 states.

Van Zee A. *Am J Pub Hlth*. 2009;99(2):221-227.

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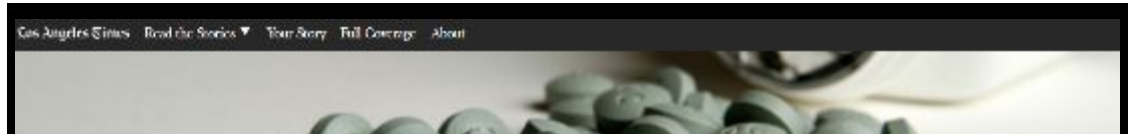
Intentional Deception



Boosting the dosage could extend the duration to some degree, but it didn't guarantee 12 hours of relief. Higher doses did mean more money for Purdue and its sales reps. The company charged wholesalers on average about $97 for a bottle of the 10-milligram pills, the smallest dosage, while the maximum strength, 80 milligrams, ran more than $630, according to 2001 sales data the company disclosed in litigation with the state of West Virginia. Commissions and performance evaluations for the sales force were based in part on the proportion of sales from high-dose pills.

- Withdrawal pain treated as BT
- Reinforced benefit of drug
- Escalated doses
  - ↑ doses
  - ↑ profits

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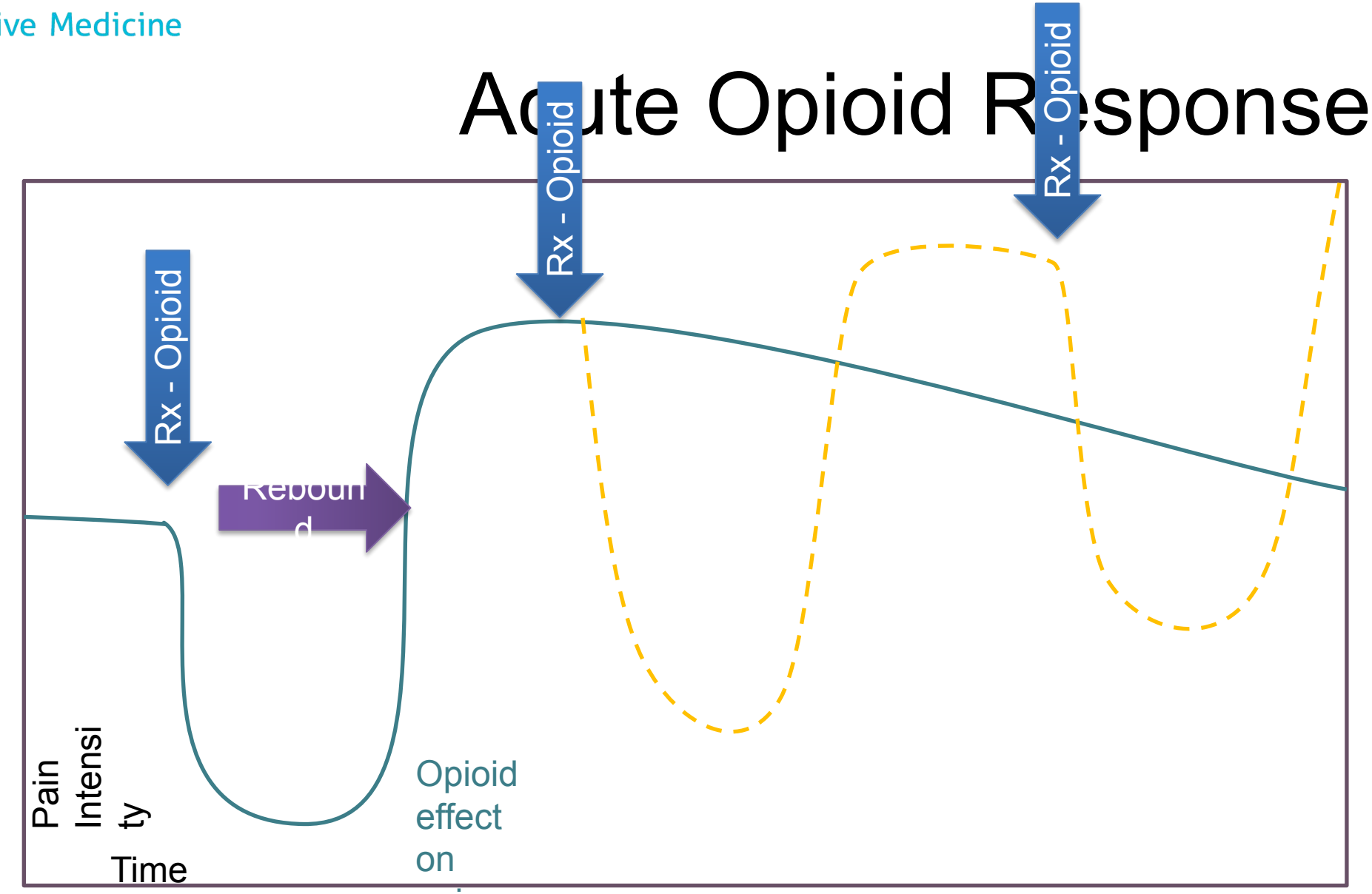
Acute Opioid Response



Mauermann et al. *Anesthesiology* 2016 Feb;124(2):453-63

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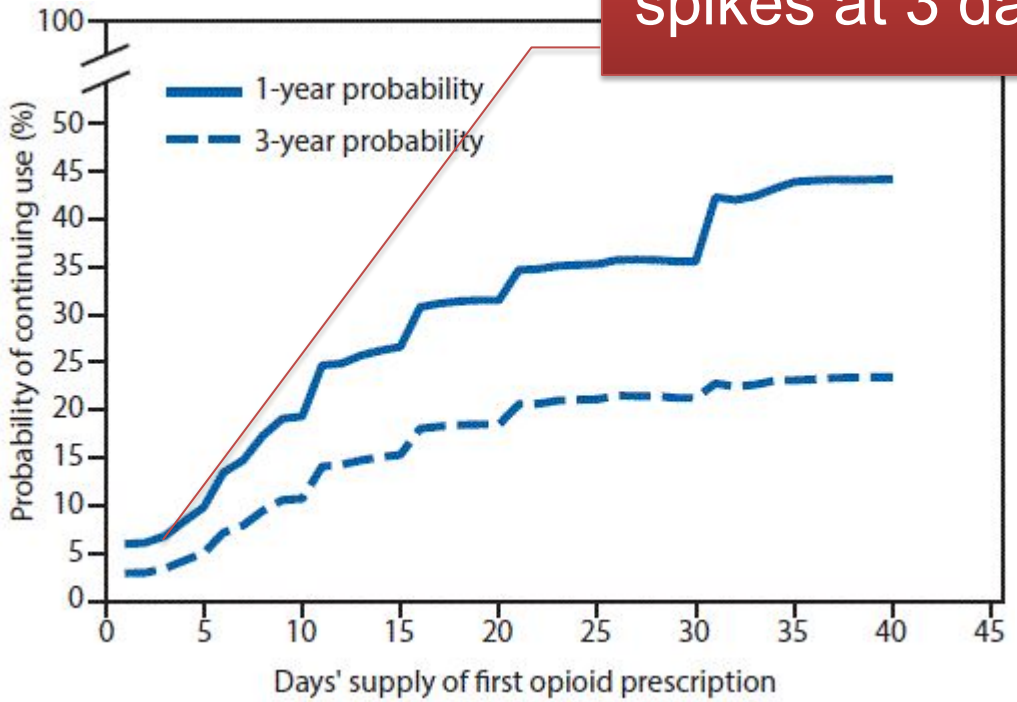
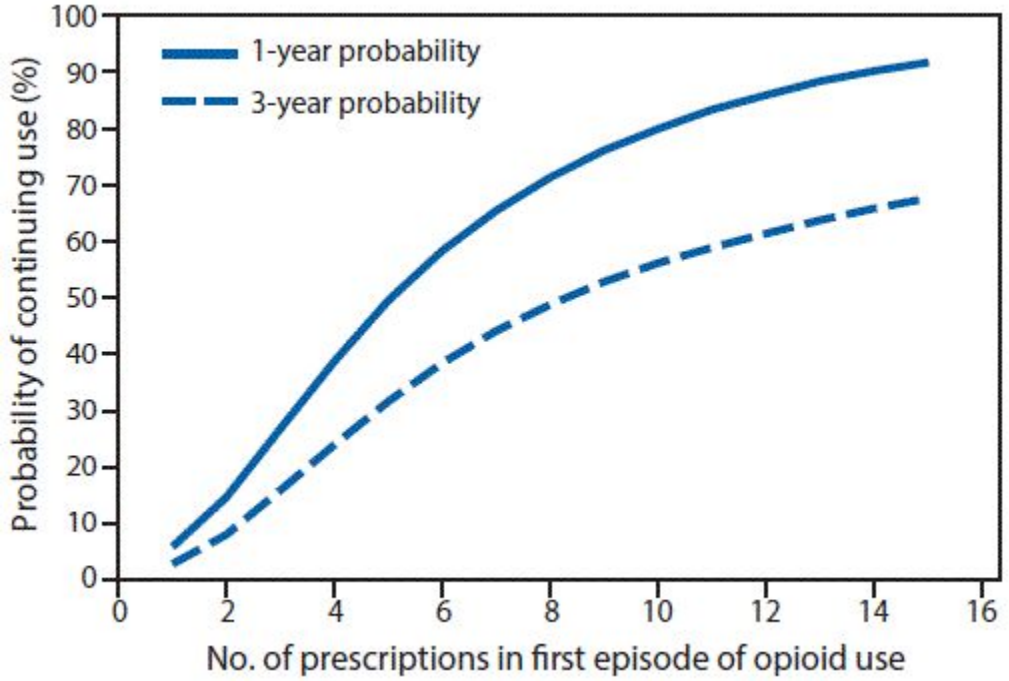
Onset of D

Chronic Use risk spikes at 3 days





Long-term use > 1 year after 1st Rx

- 6% for >1 day
- 13.5% >8 days
- 29.9% >31 days (7% of all Rx)

Shah A, Hayes CJ, Martin BC. Characteristics of Initial Prescription Episodes and Likelihood of Long-Term Opioid Use — United States, 2006–2015. MMWR Morb Mortal Wkly Rep 2017;66:265–269. DOI: http://dx.doi.org/10.15585/mmwr.mm6610a1.

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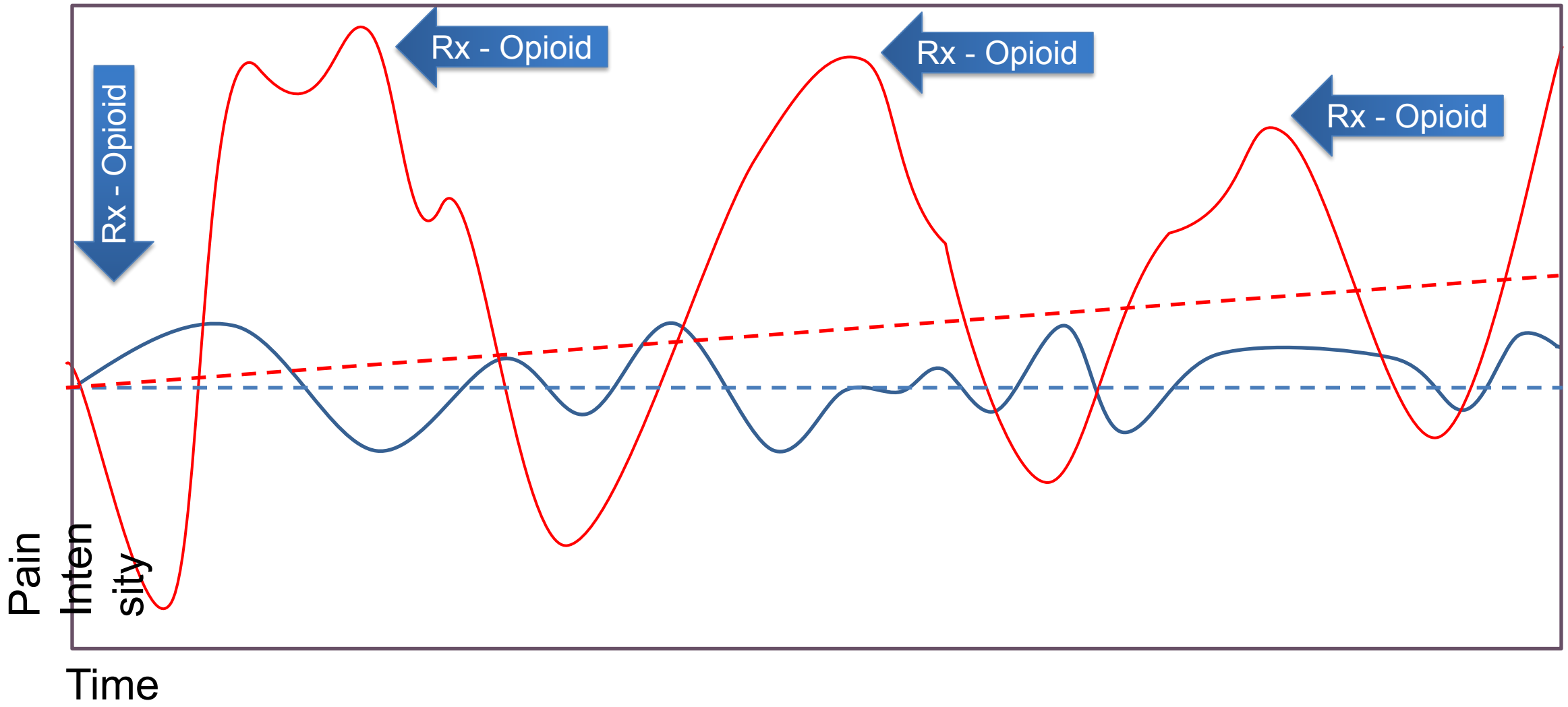
Chronic Opioid Response



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Using Opioids

ACUTE

ACUTE on CHRONIC

Palliative

CHRONIC

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Optimizing Cost of Care

- Avg Arthroplasty: $15-30k/joint

- Additional costs
  - Pain & rehabilitation
  - Length of Stay
  - Readmissions
  - Complications
  - Infections

Who will heal faster?

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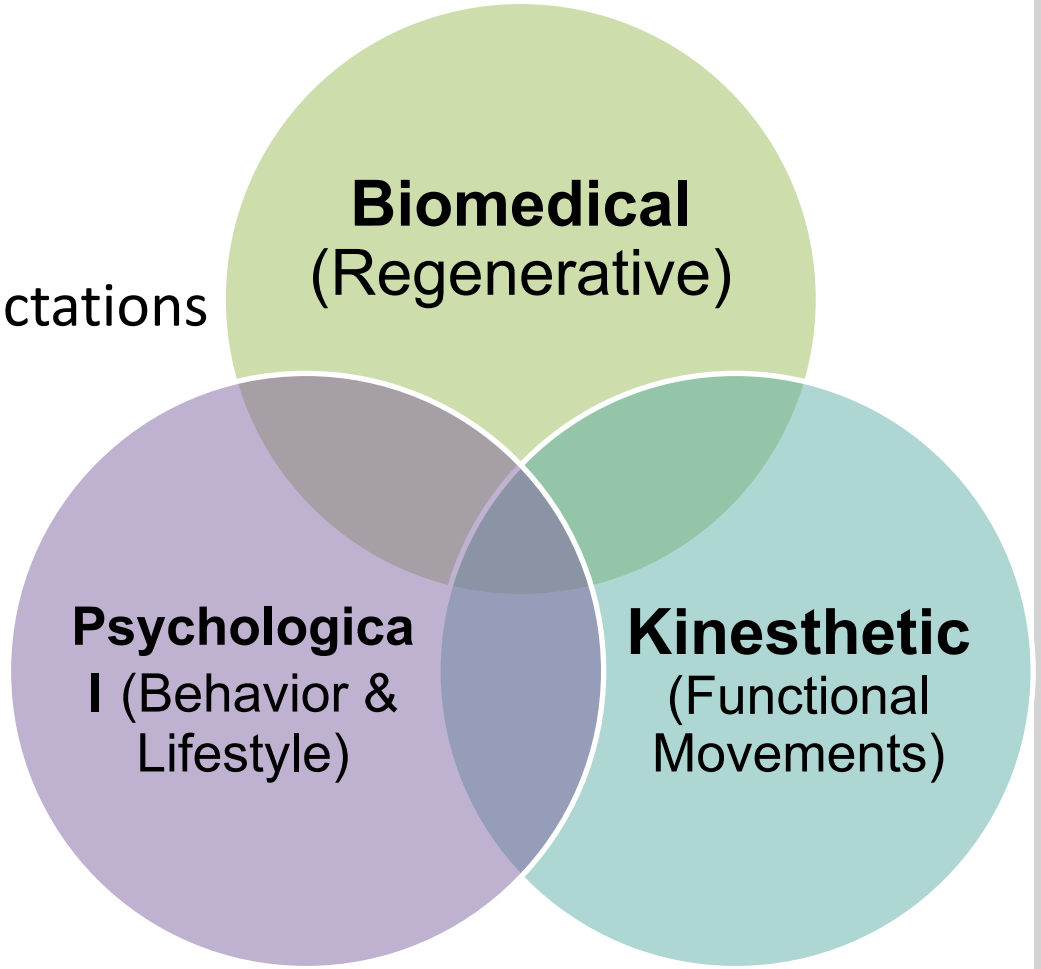
Optimizing Value of Care

- Lifestyle
  - Metabolic: Obesity, Diabetes, Nutrition
  - Circulation: Nicotine
  - Neuropsych: Cognition, mood, pain expectations
- Biomedical
  - Cellular integrity & tissue healing
  - Pain control
- Biomechanics
  - Prehab, range of motion



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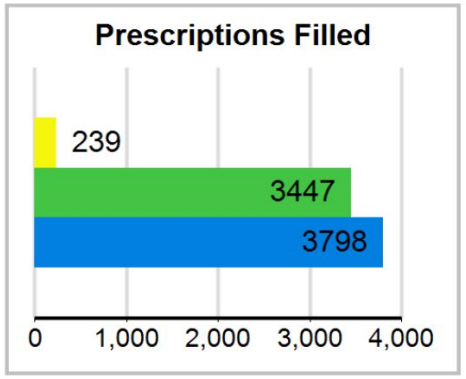
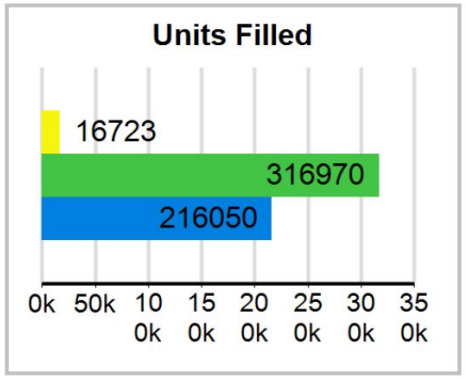
heal

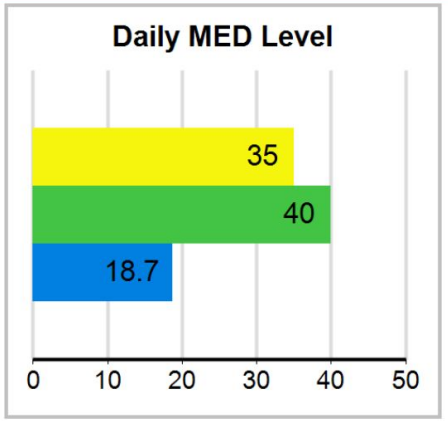
Opioids Excluding Buprenorphine Products

Average Patient Daily Opioid MED Level

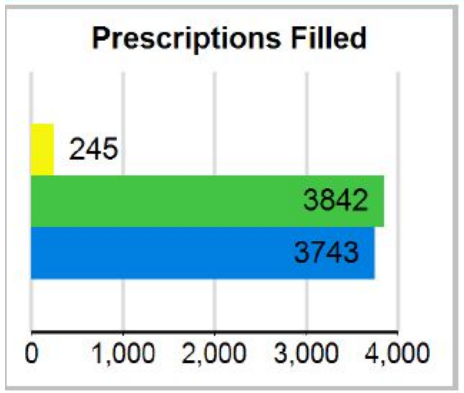
2021

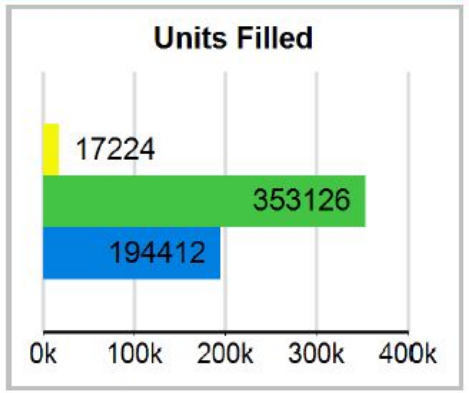


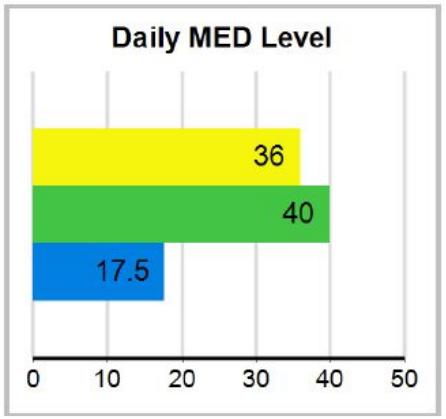




2020







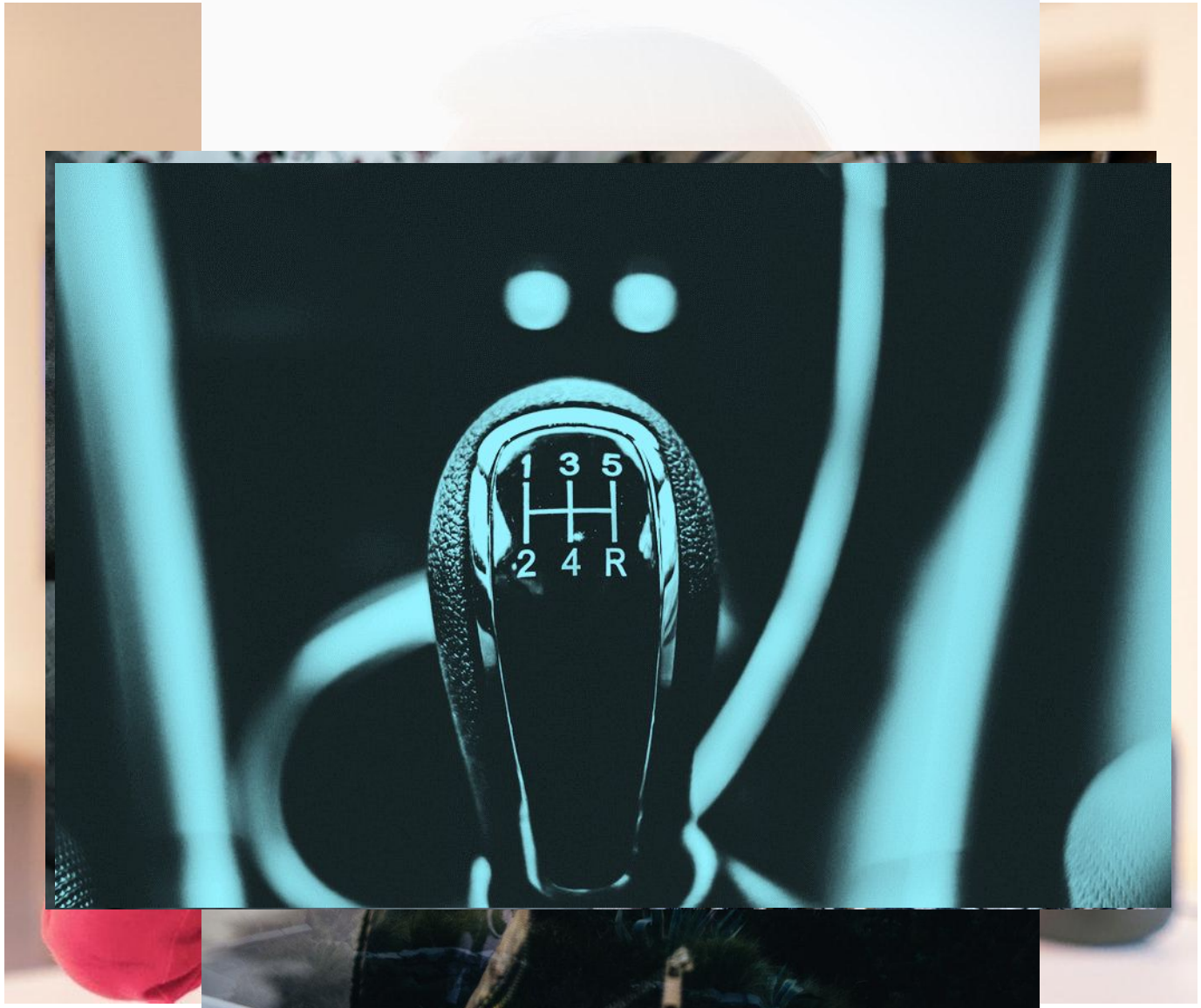
Legend: State Avg. Specialty Avg. You

Hear

Envision

Alleviate

Leverage



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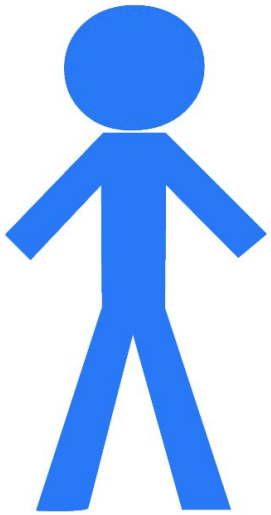
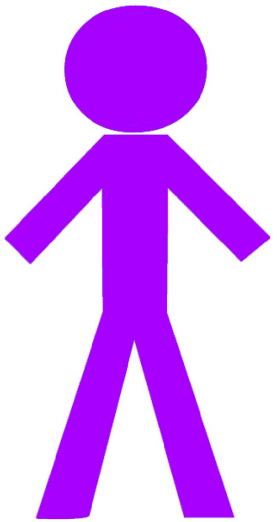
Differential Populations



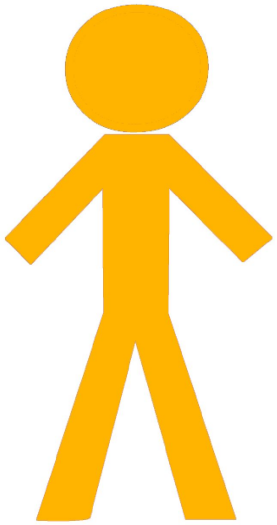
Opioid naïve

Protect & Prevent



Opioid dependent

Address pain & wean



Opioid addicted

Treat addiction & Treat pain

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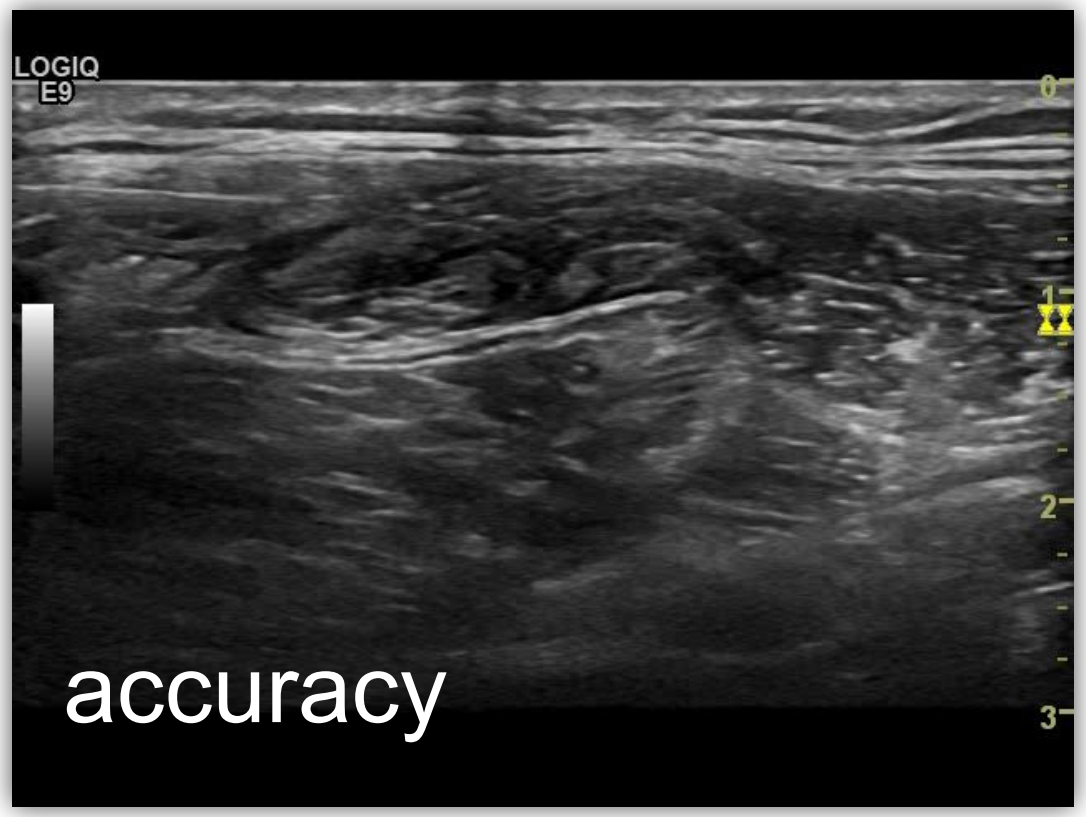
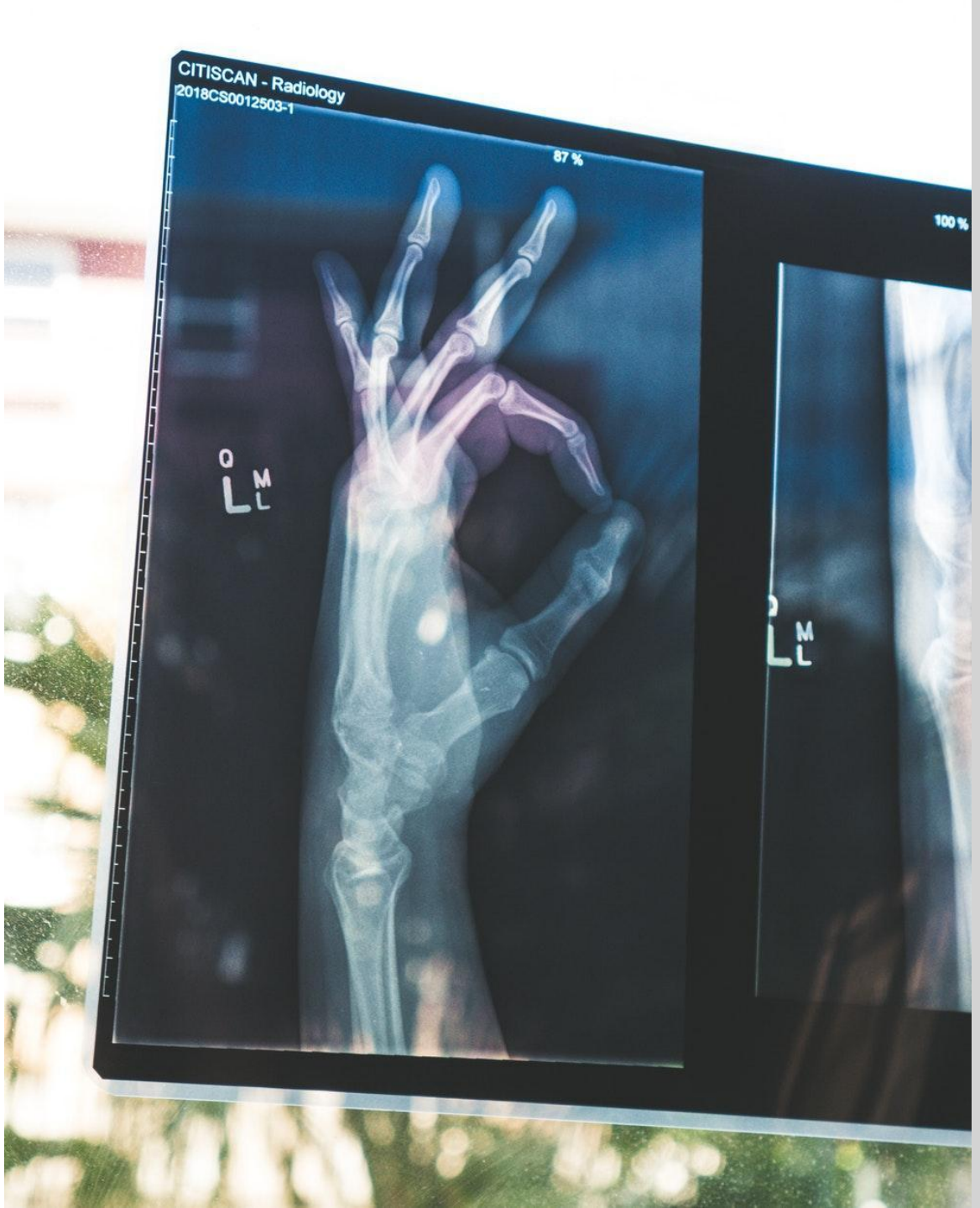


Hearing…



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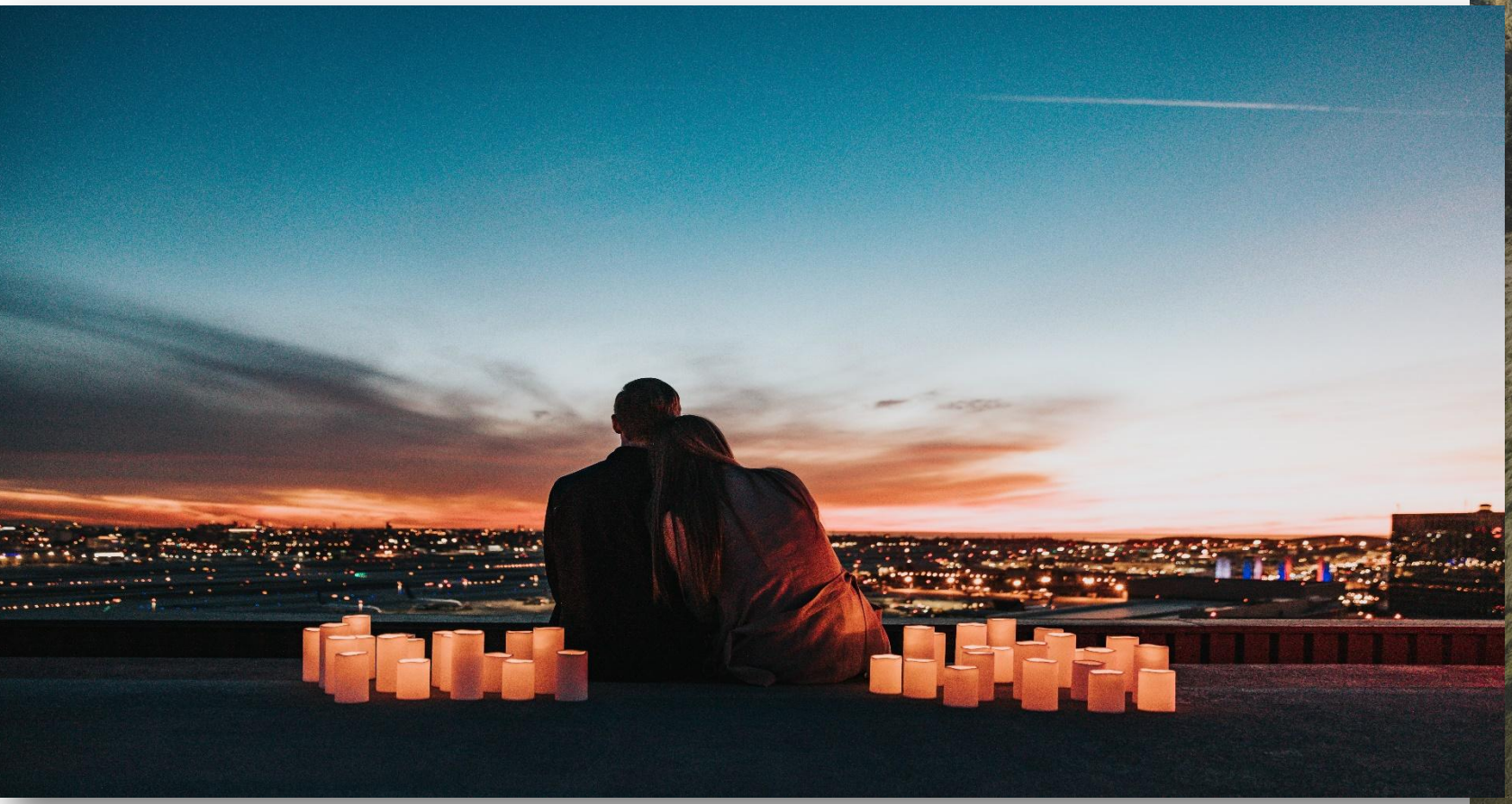

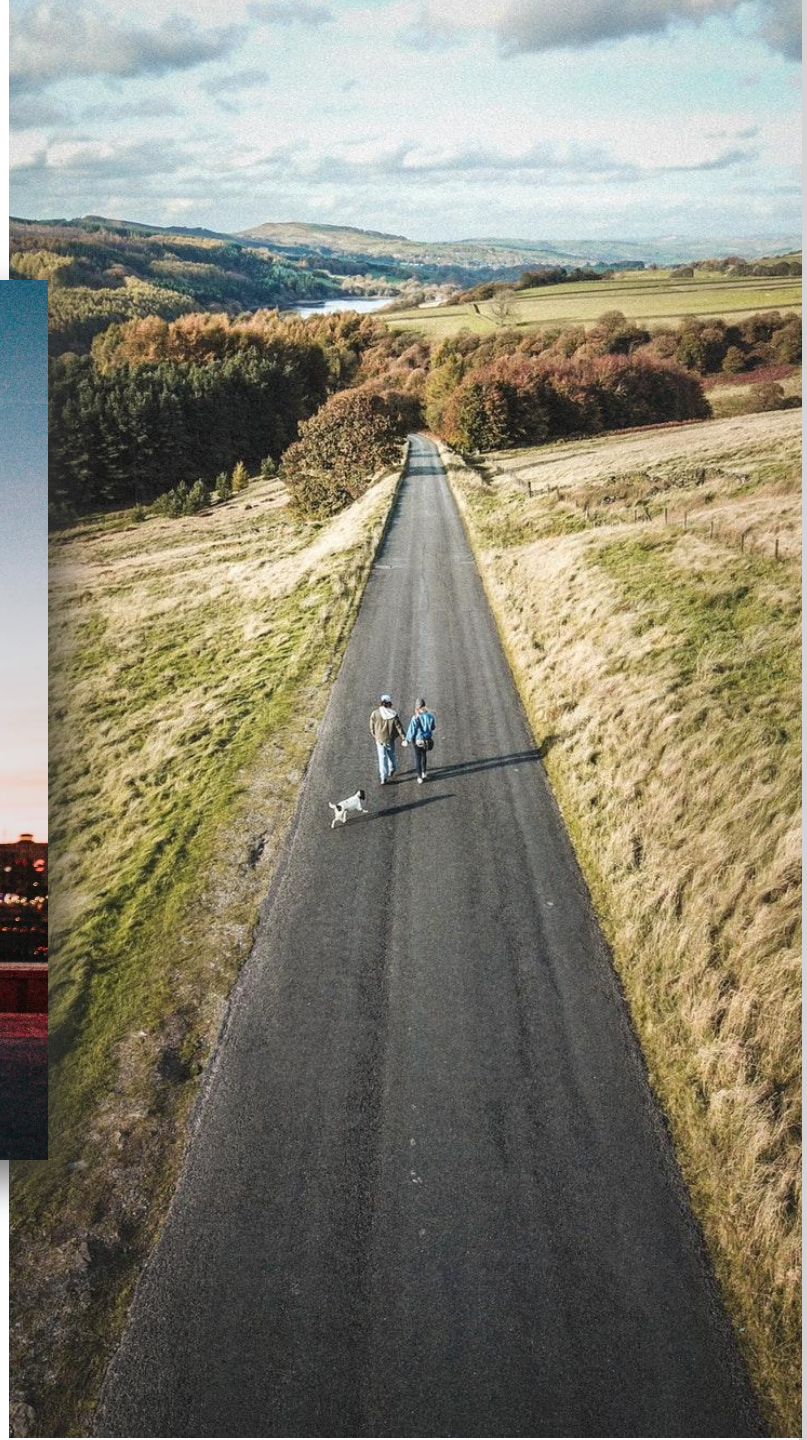

Envisioning…

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Alleviating…

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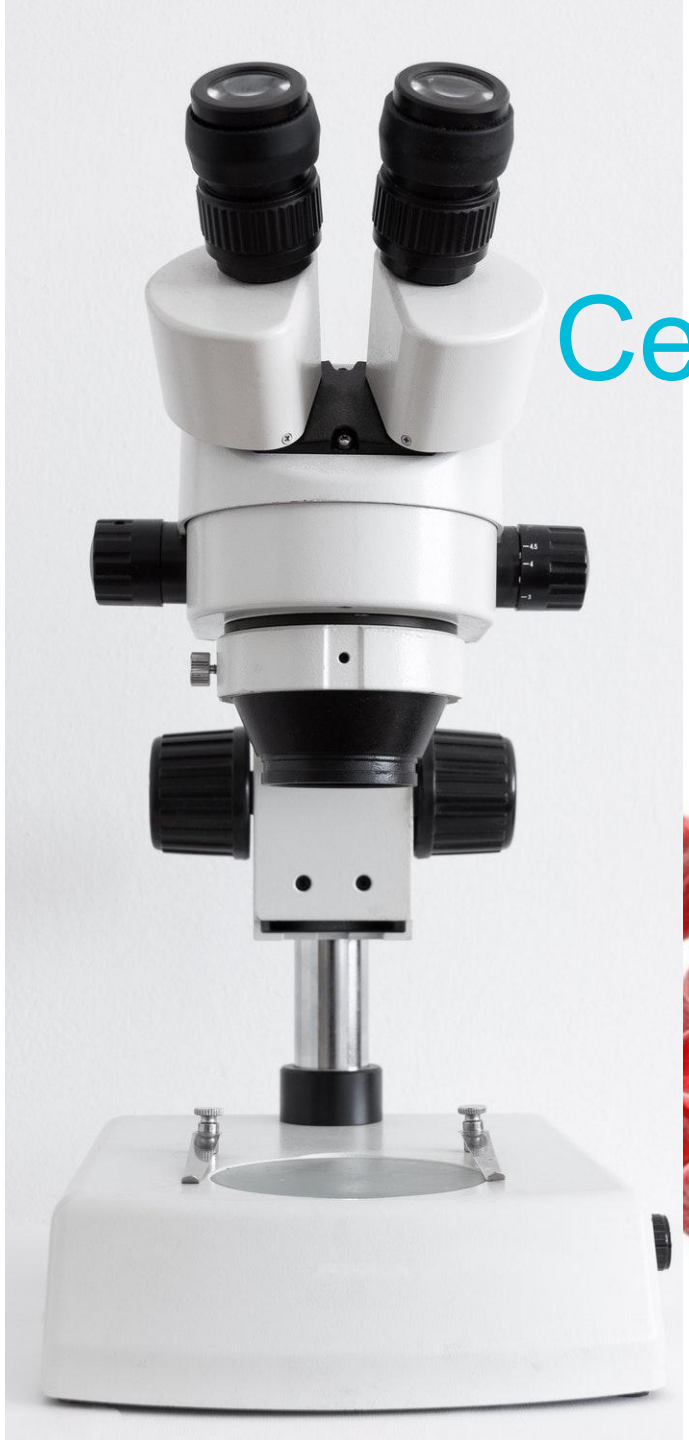

Cellular Healing

Leveraging…

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Scaling expertise

- Stage 1: Understanding the institutional context
  - Demographics of pts and providers
  - Map areas of system affected by pain
  - Inventory pain protocols, expertise, specialties, silos
  - Logistical assets (Meeting space, EMR, IT infrastructure)

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Consulting

- Stage 2: Defining the metrics
  - Pain relevant cases and frequency
  - Opioid reliance (MEDD)
  - Markers of abuse and opioid use disorder
  - Pain assessment practices and scores

- Stage 3:
  - Develop educational resources & mechanism of access (patients, admin, & healthcare providers)
  - Develop monitoring tools and the goals for its use
  - Design best-practices protocols with defined oversite for refinement
  - Integrate best-practices with healthcare IT system (monitor use, compliance, and refinement)
  - Facilitate equipment procurement and expertise recruitment where needed

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Questions?

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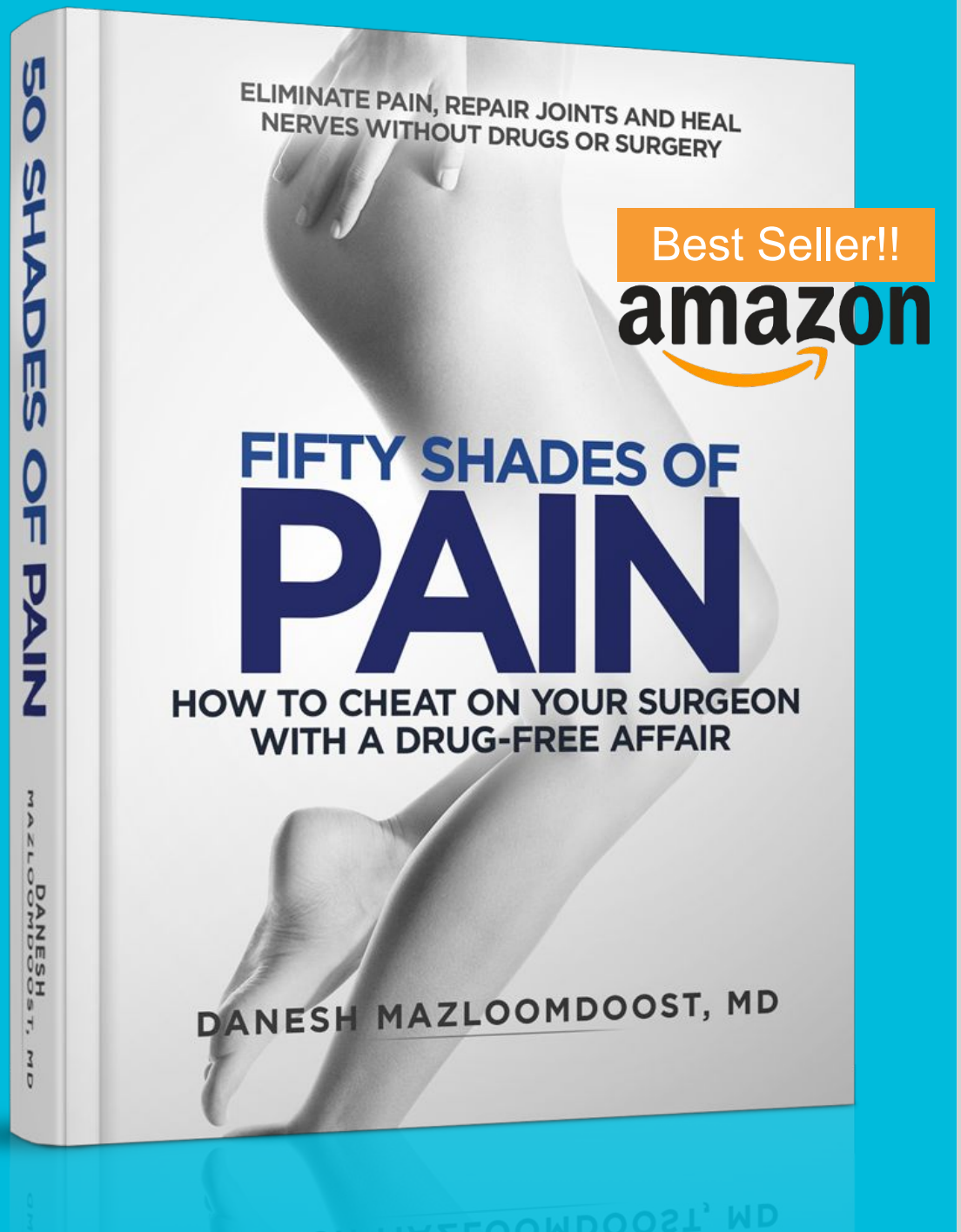

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Healing Beyond Medicine

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Regenerative Medicine

Case Studies

- Case1: TKR w/ poor pain mgmt. 16 days in hospital
- Case2: Lumbar laminectomy & fusion complicated w/ infection then slow rehab
- Case 3: SCS implant later explant
- Case 4: Post C-section pain

- Case1: Thoughtful pre-op pain plan
- Case2: Minimally Invasive Lumbar Decompression & Ligament Tx then rehab
- Case3: Finding mechanical cause of pain
- Case4: Treat neuropathic pain

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