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This presentation is part of the Community Rounds Workshop Series

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Acute Pain Management Following Surgery: Safe Opioid Prescribing and Strategies to Reduce Opioid Overprescribing

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Disclosures

There is nothing to disclose for this UVM CORA Community Rounds session.

Potential Conflicts of Interest (*if applicable*):

There are no conflicts of interest to disclose.

All recommendations involving clinical medicine made during this talk were based on evidence that is accepted within the profession of medicine as adequate justification for their indications and contraindications in the care of patients.

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Learning Objectives

- Pre-operative planning: post-operative expectations, pain control, and function following surgery
- Recognition of the high-risk patient for opioid misuse following surgery
- Prediction of post-operative pain control needs, discharge prescription planning, post-operative pain presenting to the (rural) primary care provider (i.e. not the surgeon)
- Special considerations regarding pain management with surgery, including patients receiving MOUD

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Background

- Maternal Fetal Medicine specialist at University of Vermont
- Treat pregnant women with medical complication (diabetes, high blood pressure) as well as pregnancy-specific complications
- As more women needed treatment for opioid use disorder in pregnancy, I started treating women in the OB setting with buprenorphine
- Operate on pregnant women (30% cesarean rate); interested in optimal post-operative pain management for women on MOUD
- UVM CORA Clinician Advisory Board

University of Vermont from the
University of Vermont Medical Center Birthing Center

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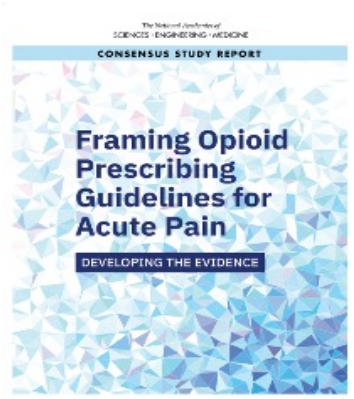
Clinical Practice Guidelines for Opioid Prescribing Are Numerous

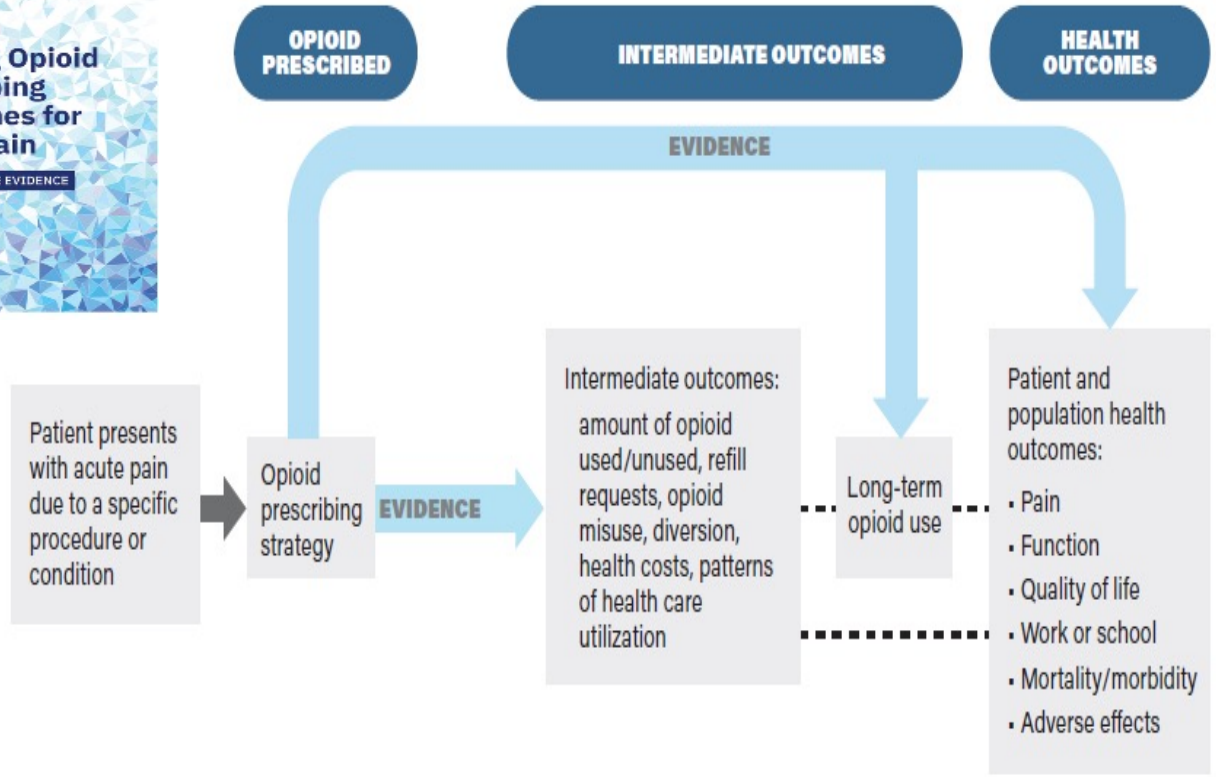
By Procedure

- Specialty Society (ie: American College OBGYN, American Academy Orthopedic Surgeons)
- Hospital
- Legislative (state prescribing limits)

Most have poor evidence base

NASEM (formerly IOM) proposed Framework by which a guideline regarding the amount of opioids prescribed for acute pain should be constructed





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Surgery is painful

The mainstay for post-operative pain treatment is opioid analgesics

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Surgery and Pain

- The first post-operative day is the worst
- Pain not related to incision size or tissue damage
- Laparoscopic procedures can be as painful as open procedures
- Pain can be just as intense for minor procedures as major procedures
- When considering discharge prescribing, important to note that for open procedures, might be discharged post-operative day 4-5; for laparoscopic and minor procedures post-operative day 1 (most intense pain)
- Same day procedure discharge: patients might have regional nerve blocks that will wane over 24 hours

Make no assumptions about pain with surgery.
All are all are painful.

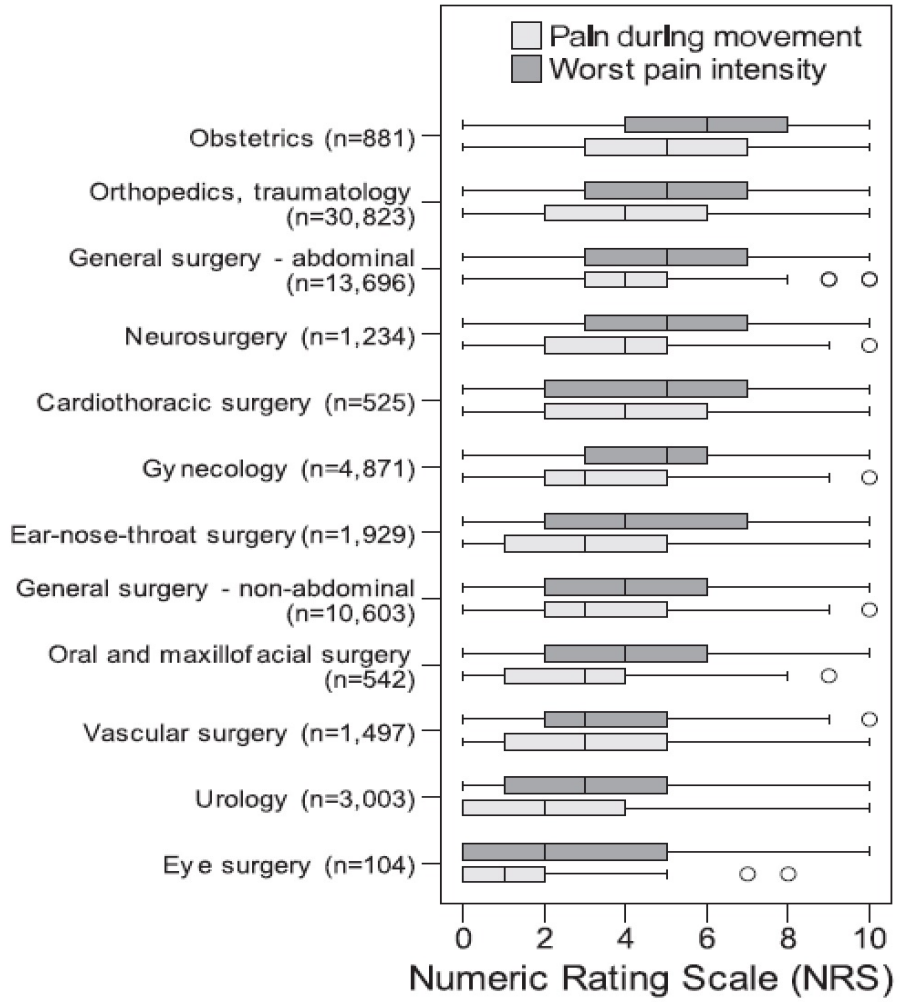

Fig. 2. Comparison of pain intensities between surgical specialties. Worst pain and pain during movement since surgery were assessed on the first postoperative day.

Anesthesiology 2013; 118:934-44

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- Fear of pain from surgery is deeply rooted
- 80% of patients experience moderate to severe pain
  - Pain resolves relatively quickly: 41% moderate to severe on POD 1 reduced to 16% by POD 3
- Satisfactory pain management is important for:
  - Patient satisfaction
  - Optimizes post-operative outcome
  - Increases functional recovery
  - May reduce subsequent chronic postoperative pain
  - High levels of pain on POD 4 increases the risk of functional impairment 6 months later

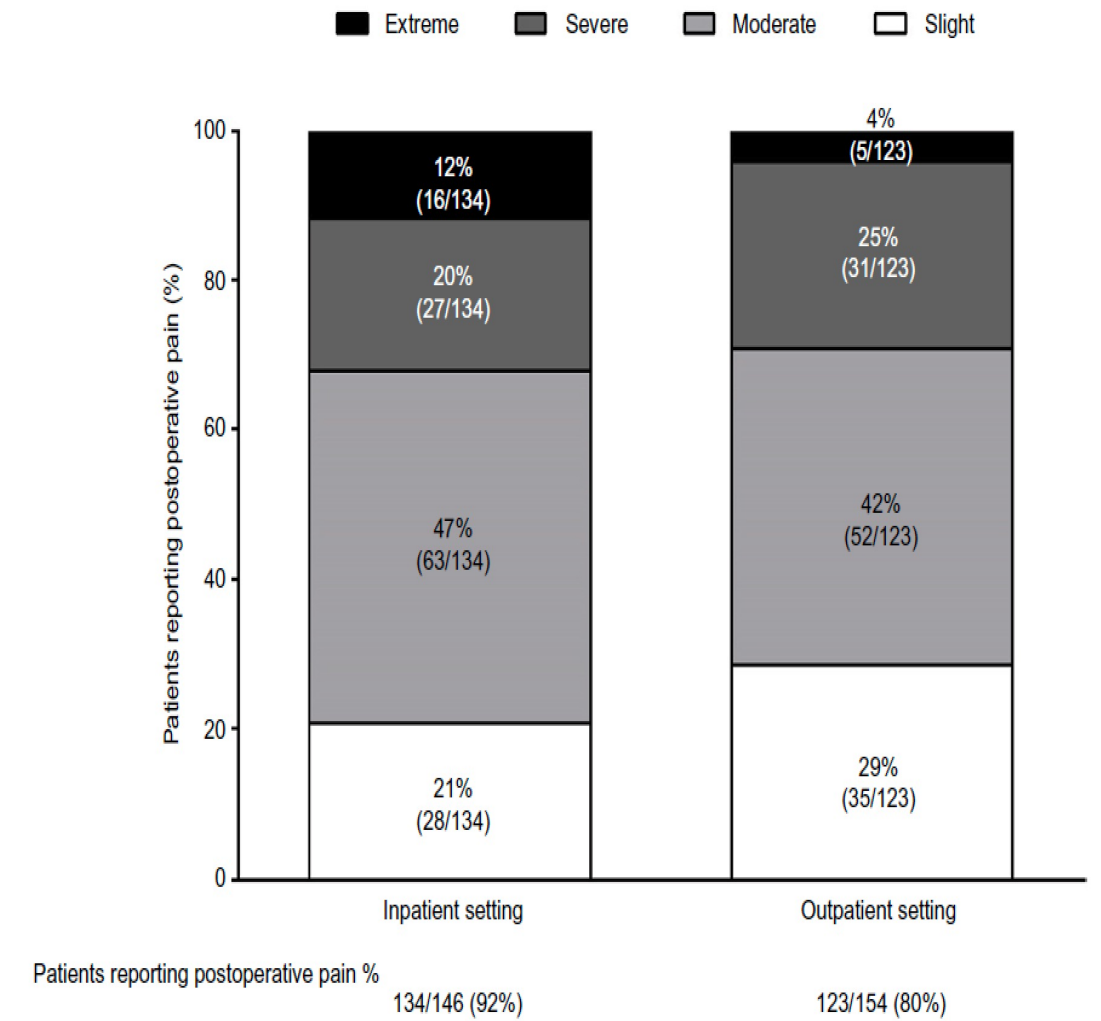

Figure 1 Proportion of patients with postoperative pain in inpatient and outpatient settings by pain severity.
Note: Incidence, patient satisfaction, and perceptions of post-surgical pain: results from a US national survey. Gan TJ, Habib AS, Miller TE, White W, Apfelbaum JL.*Current Medical Research and Opinion*. Jan 2014. Reprinted by permission of the publisher (Taylor & Francis Ltd, http://www.tandfonline.com).[13]

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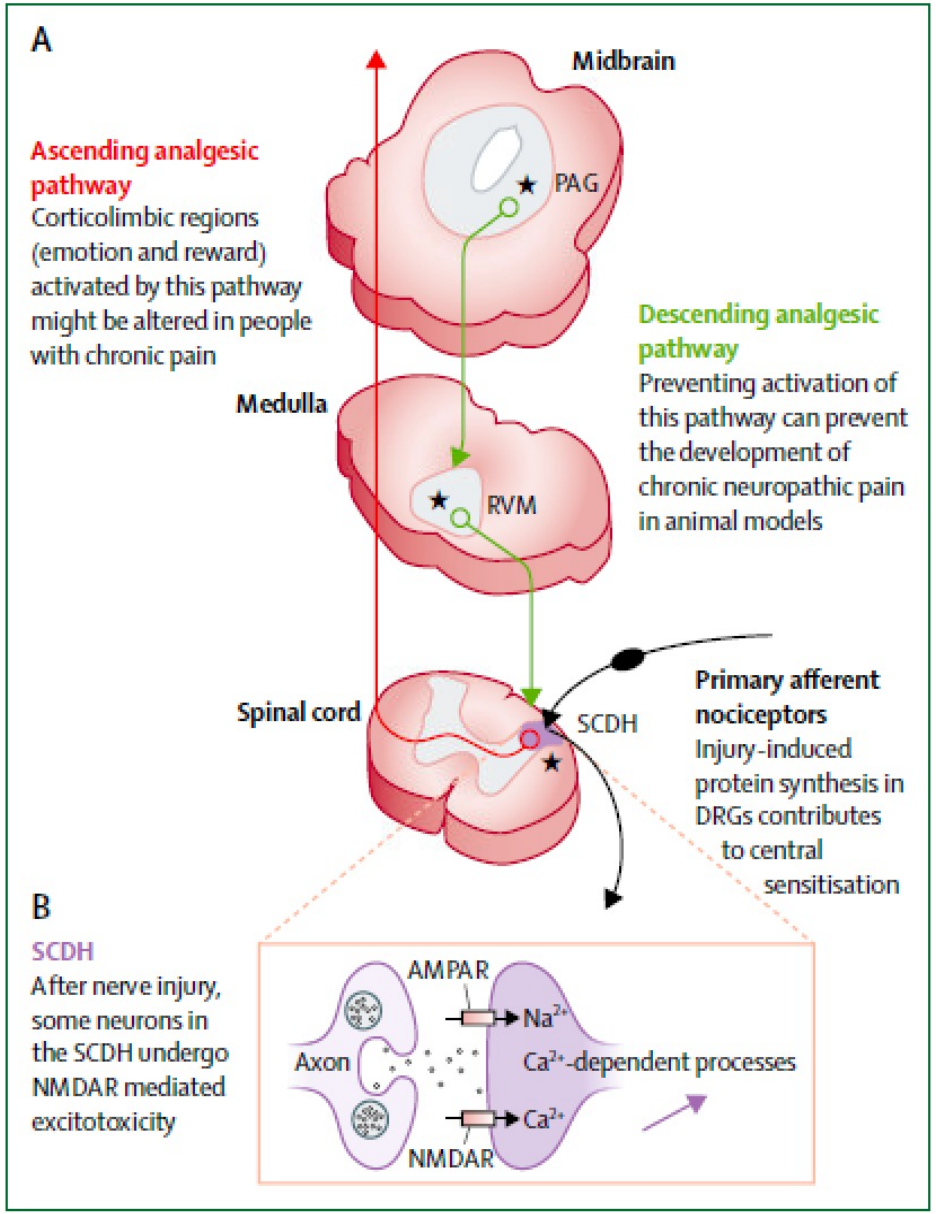
Pain is complicated

Opioid prescribing following surgery

Discharge post-operative opioid prescribing:
Initial prescription at the time of discharge post procedure

Persistent post operative prescribing:
Chronic postoperative pain



Lancet 2019; 393: 1537–46

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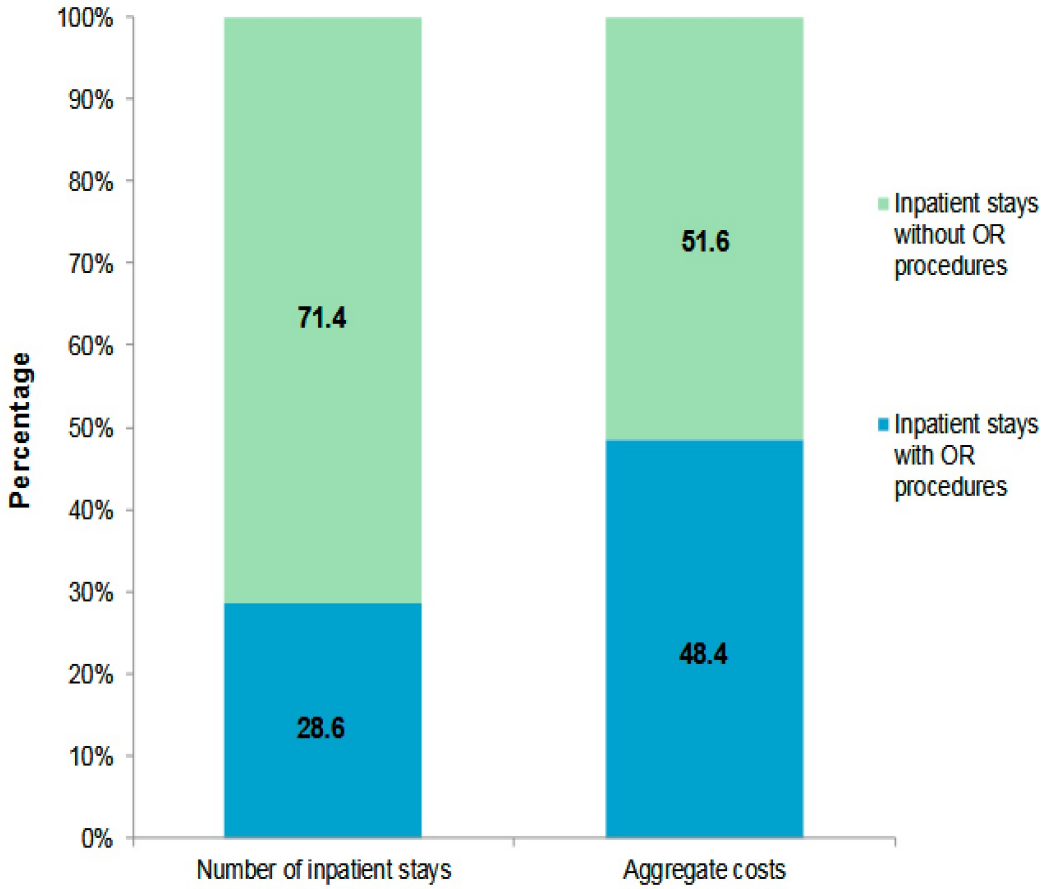
Post-procedure Discharge Opioid Prescribing

A LOT of surgical procedures occur in the US:

- 29 million ambulatory surgical visits (2010)
- 10 million inpatient stays had an operating room procedure (2014)
- 40% of health care expenditures are related to surgery
- 80-90% of patients are discharged with an opioid following a procedure

https://www.hcup-us.ahrq.gov/reports/statbriefs/sb233-Operating-Room-Procedures-United-States-2014.pdf

Figure 1. Percentage of inpatient stays and aggregate costs for inpatient stays with and without operating room (OR) procedures, 2014



Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP) National Inpatient Sample (NIS), 2014

- **Inpatient stays with OR procedures accounted for more than one-fourth of all hospitalizations and almost half of all aggregate hospital costs in 2014.**

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AMERICAN COLLEGE OF SURGEONS
100+years
Inspiring Quality: Highest Standards, Better Outcomes

- 1300 Critical Access Hospitals
- Surgery performed in 2/3 of these
- Rural surgeons have higher caseloads than surgeons in urban settings
- It is important and distinct enough that surgery training programs specifically train for rural practice
- Post-operative access might be more difficult and these surgeons might rely on PCPs more heavily than urban counterparts

Rural Surgery Program

To assist you in your search for general surgery training programs in the United States that have a special focus (or track) related to rural surgery, the American College of Surgeons' Rural Surgery Advisory Council has compiled a list of ten programs across the United States that meet these criteria. A detailed description of each program, along with contact information for the program director or coordinator, may be found by opening up the link below to the specific program you are interested in.

ORIGINAL REPORTS

Creating a Rural Surgery Track and a Review of Rural Surgery Training Programs

Phillip J. Mercier, MD,[,1] Steven J. Skube, MD,[*,1] Samantha L. Leonard, MD,[*] Ashley N. McElroy, MD,[*] Tyler G. Goettl, MD,[*] Melissa M. Najarian, MD,[*,†] Paula M. Termuhlen, MD,[†] and Jeffrey G. Chipman, MD[*]*

[*]Department of Surgery, University of Minnesota, Minneapolis, Minnesota; and [†]Department of Surgery, Essentia Health-St. Mary's Medical Center, Duluth, Minnesota

Journal of Surgical Education • *Volume 76 /Number 2 • March/April 2019*

https://bulletin.facs.org/2016/10/rural-surgery-and-the-volume-dilemma 2016

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- Patients might require surgery at an urban center and return to your rural communities soon after surgery
- 60 million people live in rural areas; account for 12% of the 35 million hospitalizations that occur
- They will rely on PCPs for assessment in the acute setting (and surgeons may not communicate that well with the PCP)
- Ditto for Obstetrics

Surg Clin N Am 100 (2020) 835–847

Rural Surgery and Status of the Rural Workplace

Hospital Survival and Economics

Adrian Diaz, MD, MPH[a,b,c], Timothy M. Pawlik, MD, MPH, MTS, PhD[c,*]

KEYWORDS

• Rural • Surgery • Access • Hospital closure

KEY POINTS

- One in 5 residents (nearly 60 million people) live in a rural area, accounting for 12% of the 35 million hospitalizations across the United States.
- Since 2005, 162 rural hospitals have closed, and the rate of rural hospital closures seems to be accelerating with an additional 700 hospitals at risk of closure.
- Major drivers of rural hospital closures are poor financial health, aging facilities, and low occupancy rates.
- Rural hospitals are particularly vulnerable to policy and market changes, and even small changes can have a disproportionate effect on rural hospital financial viability.
- Surgery can be safely performed in rural hospitals; however, hospital closures may be putting the rural population at increased risk of morbidity and mortality from surgical disease.

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Post-procedure Discharge Opioid Prescribing

A LOT of surgical procedures occur in the US:

- 70-80% of patients are discharged with an opioid following a procedure

A LOT of post-operative opioids are prescribed in the US

- About 200 MME

(oxycodone 5 mg=7.5 morphine milligram equivalents.
Prescription 200 MME=27 tablets of oxycodone
(prescription 20-30 pills)

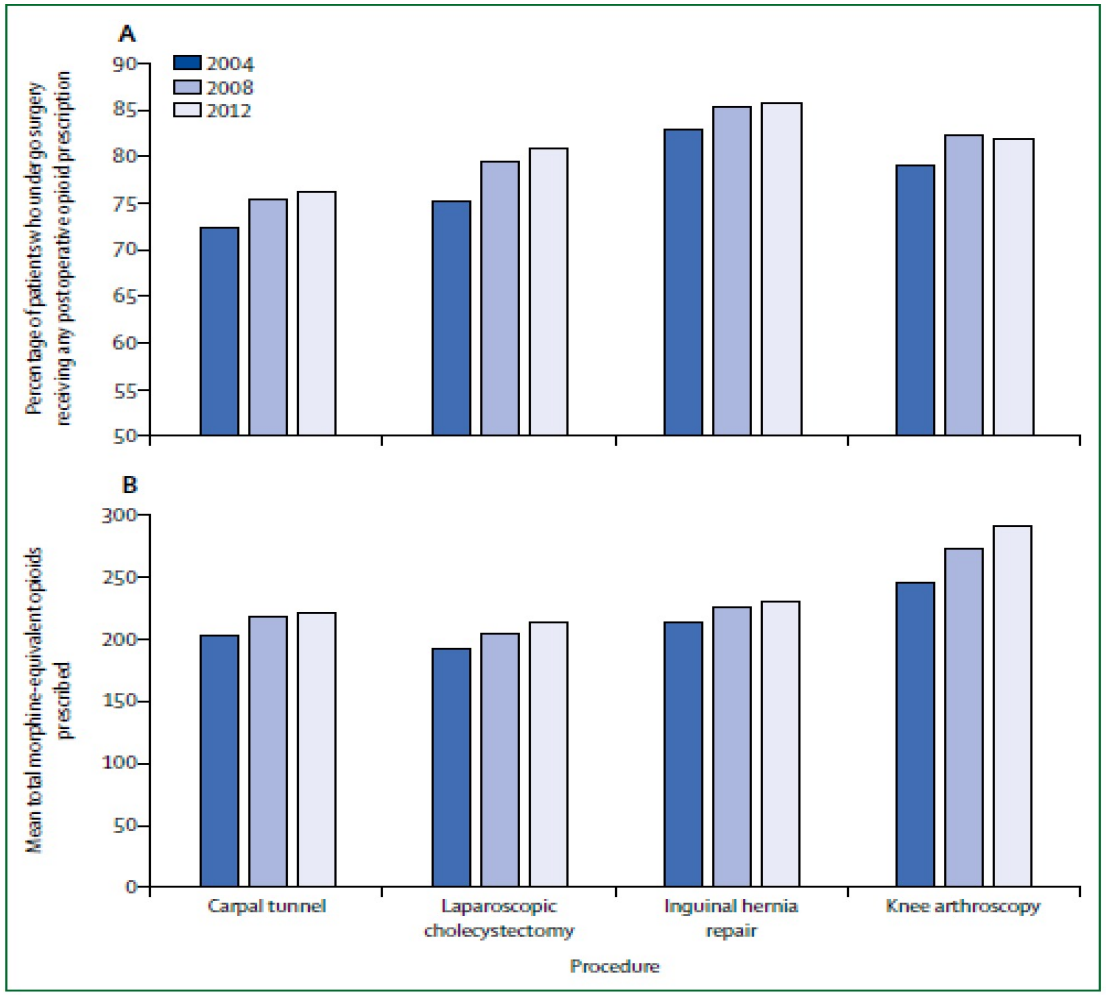

***Figure*: Increasing prescribing of opioids after surgery in the USA**
Changes in patterns of postoperative opioid prescribing between 2002 and 2012 for four common low-risk procedures among 155 297 US adults who had private insurance and did not use opioids 6 months before surgery. (A) The percentage of all patients filling any opioid prescription within the first 7 days after surgery by year and procedure type. (B) The average amount of opioid pain medication received in morphine equivalents among those filling a prescription by year and procedure type.[44]

Lancet 2019; 393: 1547–57

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Most patients use less than half the opioids that are prescribed (open cases (large incision) or laparoscopy)

Open cases	Opioid prescribed	Opioid consumed	% patients used no opioids after discharge	% patients that used <50% of prescribed
Inguinal hernia	150 MME	15 (0-56) MME	**39%**	**72%**
Ovarian cytoreduction	150 MME	30 (0-108) MME	**39%**	**60%**
Pancreatoduodenectomy	150 MME	45 (0-300) MME	**45%**	**54%**
Nephrectomy	90 MME	100 MME		**67%**
Prostatectomy	90 MME	70mMME		**67%**
Hysterectomy	225 MME			**43%**
Cesarean	200-300 MME	100 MME	**17%**	**75%**

Laparoscopy	Opioid prescribed	Opioid used	% patients used no post discharge opioid	% patients used <50% of opioid
l/scope chole	200 (45-600) MME	25 (0-67) MME	**35%**	**67%**
l/scope hernia	250-300 MME	7.5 (0-45) MME	**45%**	**75%**
l/scope low anterior resection	50-400 MME	11.3 (0-165) MME	**50%**	**60%**
l/scope prostate	200-300 MME	30(0-112)	**35%**	**61%**
l/scope nephrectomy	250-300 MME	33.7 (0-140)	**33%**	**58%**

(oxycodone 5 mg=7.5 morphine milligram equivalents. Prescription: 20 pills: 150 MME; 30 pills: 225 MME)

Most services have standard opioid discharge prescriptions

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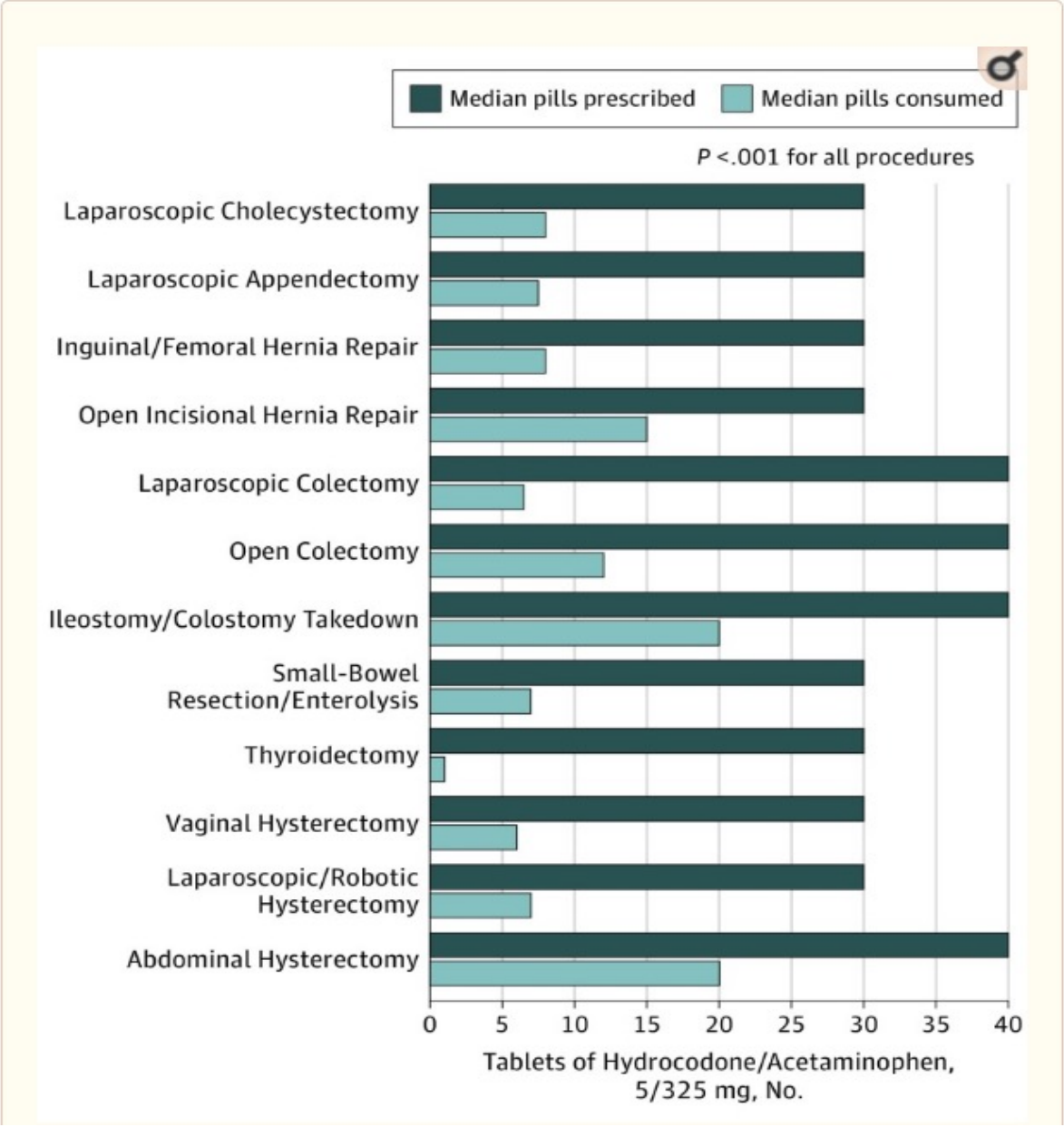
The more opioids prescribed, the more opioids are used

Patients used an additional 5 pills for every 10 extra pills prescribed

Note: avoid combination APAP with opioid to allow maximal APAP dose



JAMA Surg. 2019 Jan; 154(1): e184234.

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Individualized and shared decision making on discharge opioid prescription

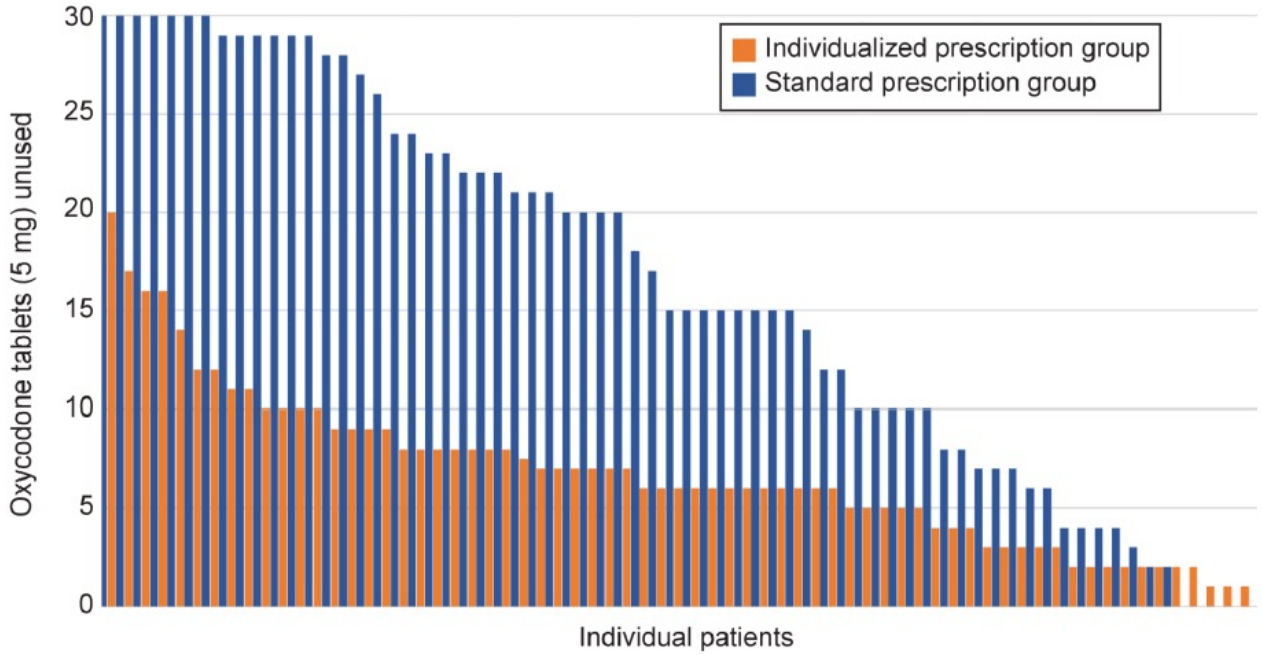

Figure 2.
Total oxycodone tablets (5 mg) unused for each patient in standard compared with individualized groups sorted in descending order.

Obstet Gynecol. 2018 September ; 132(3): 624–630.

Osmundson et al., 2018

Individual prescribing:
14 (12-16) tablets prescribed
5 (1-8) unused tablets
8 (4-14) tablets used
60% of tablets used

Standard prescribing:
30 tablets prescribed
10 (0-22) tablets unused
15 (6-30) tablets used
60% of tablets used

Primary Outcome:
Number of opioid tablets prescribed
but unused (oxycodone 5 mg)

Secondary outcome:
Number of tablets used
Frequency of opioid use
Frequency of refills
Pain satisfaction survey

Individual prescribing not only reduced the number of opioid tablets that remained unused, it also reduced the use of opioids

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Prescription Opioid Use, Misuse, and Use Disorders in U.S. Adults: 2015 National Survey on Drug Use and Health

Han et al., 2017

- Excess opioid prescriptions contribute to misuse
- Patients and others are harmed
- 45% of opioids from misuse come from a friend or relative

Opioid availability from:

- Prescribing either too much opioid (which allows diversion to others)
- getting a prescription from a provider are the major contributors to opioid availability and misuse

Table 4. Source of Prescription Opioids Obtained for Most Recent Episode of Misuse Among Adults With Misuse and Use Disorder in Past 12 Months*

Source	Adults Reporting Misuse Without Use Disorder (n = 2500)	Adults Reporting Use Disorder (n = 500)
Obtained for free from friend/relative	44.6 (41.79-47.39)	21.8 (16.86-26.78)
Obtained from 1 physician	33.8 (30.95-36.55)	40.4 (34.08-46.62)
Obtained from >1 physician	1.3 (0.60-1.98)	3.9 (0.50-7.24)
Bought from friend/relative	8.5 (6.98-10.00)	14.1 (10.47-17.65)
Bought from drug dealer/ stranger	3.1 (2.32-3.88)	13.8 (10.25-17.27)
Stolen from friend/relative	3.6 (2.53-4.61)	†
Stolen from physician's office, clinic, or pharmacy	0.5 (0.20-0.86)	†
Other	4.7 (3.41-5.95)	3.1 (1.22-5.06)

* Values are weighted percentages (95% CIs). The Substance Abuse and Mental Health Services Administration requires that any description of overall sample sizes based on the restricted-use data files be rounded to the nearest hundred to minimize potential disclosure risk.
† Estimate suppressed because of low statistical precision.

Annals of Internal Medicine • Vol. 167 No. 5 • 5 September 2017

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Discharge Opioid Prescription Patterns after Kidney Cancer Surgery

Okoro, et al., Urology, 2021

Urban vs. Rural

- **Urban zip code: patients living in rural areas had higher MME prescriptions at discharge:**
  - 70% of all pts lived in an urban location but of those that lived in a rural area only 27% of those received lower MME discharge prescription (1-199 MME) but 40% of those living in a rural area received the higher MME (>300 MME) discharge prescription
- Urban zip code was protective for prior opioid exposure relative to rural location (0.78 (0.63-0.96)) and long-term opioid use 0.63 (0.51-0.78)
- ED visit risk 0.76 (0.60-0.95)

…"From a provider level, reasons for continued use of high-volume postoperative opioid medications include concerns that inadequate pain control may promote more numerous patient phone calls or emails and, most importantly, lead to patient dissatisfaction. These concerns may be exacerbated at tertiary care centers with wide patient referral bases, wherein many patients travel far distances to realize care…."

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Strategies to reduce excessive post-operative opioid prescribing

Beware the unintended consequences of untested recommendations/mandates

Recommendations and mandates: all can reduce opioid prescribing but no outcome data

- Surgery/Society specific recommendations
- Hospital policy/change in automated discharge orders
- State legislative
- Policy: monitoring of provider prescribing patterns through prescription monitoring

Evidence based post-operative opioid prescribing with a focus on post-procedure functional recovery: largely lacking

Opioid-Prescribing Guidelines for Common Surgical Procedures: An Expert Panel Consensus 2018

Check for updates

Heidi N Overton, MD, Marie N Hanna, MD, MEHP, William E Bruhn, BS, Susan Hutfless, PhD, MS, Mark C Bicket, MD, Martin A Makary, MD, MPH, FACS, for the Opioids After Surgery Workgroup

Outcomes

Opioid prescriptions for acute pain after outpatient surgery at a large public university-affiliated hospital: Impact of state legislation in Florida 2019

Paul Potnuru, MD[a], Roman Dudaryk, MD[a,*], Ralf E. Gebhard, MD[a], Christian Diez, MD, MBA[a], Omaida C. Velazquez, MD[b], Keith A. Candiotti, MD[a], Richard H. Epstein, MD[a]

[a] Department of Anesthesiology, Perioperative Medicine and Pain Management, University of Miami, Miller School of Medicine, Miami, FL
[b] Department of Surgery, University of Miami, Miller School of Medicine, Miami, FL

COMMENTARY

Standardizing Discharge Opioid Prescribing within General Surgery: A Patient Safety Improvement Initiative 2021

Elissa A. Falconer, MD, Brant J. Oliver, PhD, MS, MPH, FNP-BC, PMHNP-BC, Joseph Michael Wallace, MPH, RN, BSN, Jonathan Pollock, MD, Krysta Johnson-Martinez, MD

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DOI: 10.1056/CAT.20.0611

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State controlled PDMP tracks provider prescribing habits

WHAT IS A PDMP?

A PDMP is a statewide electronic database that tracks all controlled substance prescriptions. Authorized users can access prescription data such as medications dispensed and doses.

PDMPs improve patient safety by allowing clinicians to:

- Identify patients who are obtaining opioids from multiple providers.
- Calculate the total amount of opioids prescribed per day (in MME/day).
- Identify patients who are being prescribed other substances that may increase risk of opioids—such as benzodiazepines.

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Better than expert opinion/legislation/one size fits all: Shared Decision-Making Tools informed by expert opinion/legislation

Hysterectomy

- Reduced discharge prescription by about 50%
- No increase in refills (10%)

Cesarean

Table 2. Oxycodone Use After Discharge and Satisfaction With the Pain Regimen

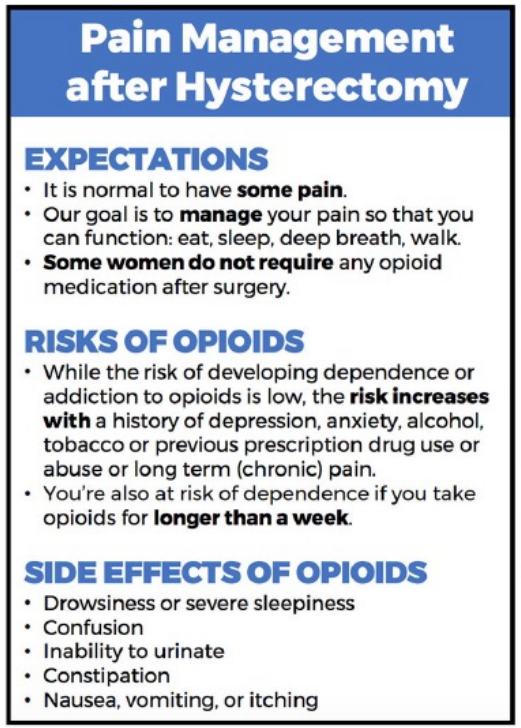
Outcome	Value
No. of oxycodone tablets chosen*	20.0 (15.0–25.0)
No. of oxycodone tablets used	15.5 (8.0–25.0)
No. of oxycodone tablets remaining	4.0 (0.0–8.0)
Need for oxycodone refills	4 (8.0)
Satisfied with outpatient pain management	26 (52.0)
Very satisfied with outpatient pain management	19 (38.0)

Data are median (interquartile range) or n (%).
* For six patients, the number of tablets prescribed was different from the number chosen such that the median (interquartile range) number of tablets dispensed was 20.0 (20.0–30.0).

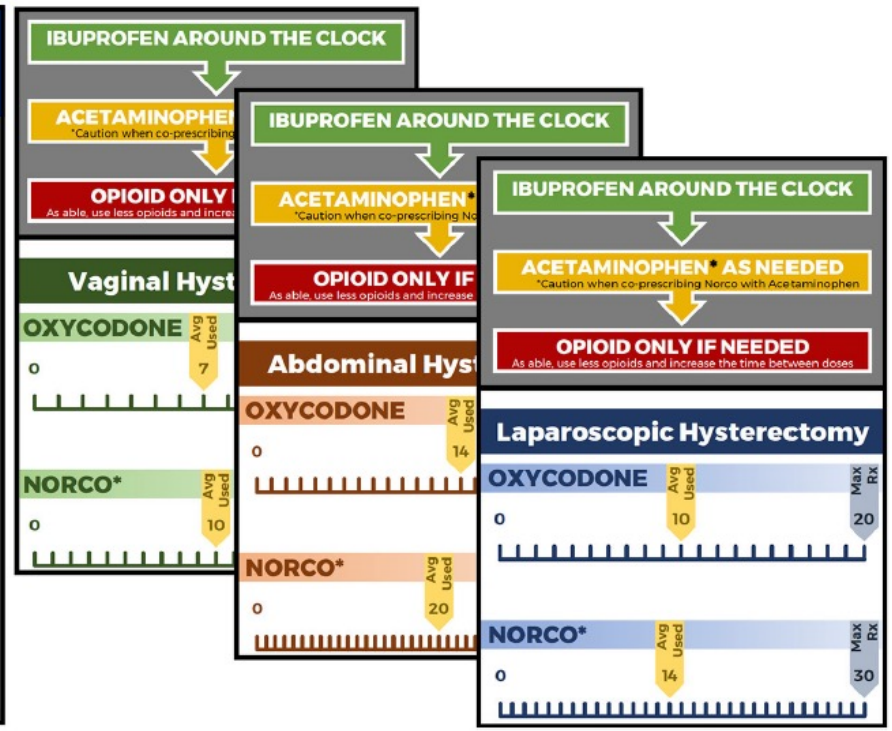
(Obstet Gynecol 2017;130:42–6)

Obstet Gynecol. 2019 October ; 134(4): 823–833. doi:10.1097/AOG.0000000000003468.

Front of Decision Aid



Back of Decision Aid



SHARED DECISION-MAKING FOR PRESCRIPTION OPIOIDS AFTER CESAREAN DELIVERY

HOW MANY TABLETS OF OXYCODONE WOULD YOU LIKE TO BE PRESCRIBED WITH?

As a reminder, you can choose any number between 0 and 40 tablets.

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Take Home Message: Initial Opioid Prescription After Surgery

- The initial prescription of opioids following surgery can and should be minimized: optimal use of non-opioid medications
- Educate patients re: functional recovery and pain expectations
- Shared decision making on opioid dose and duration (if hospitalized, use opioid amount used just prior to discharge)
- Plan for refills if needed
- Plan for disposal of unused opioids

Initial pain control is important:
Poor control is associated with persistent postsurgical pain and persistent post surgical opioid use

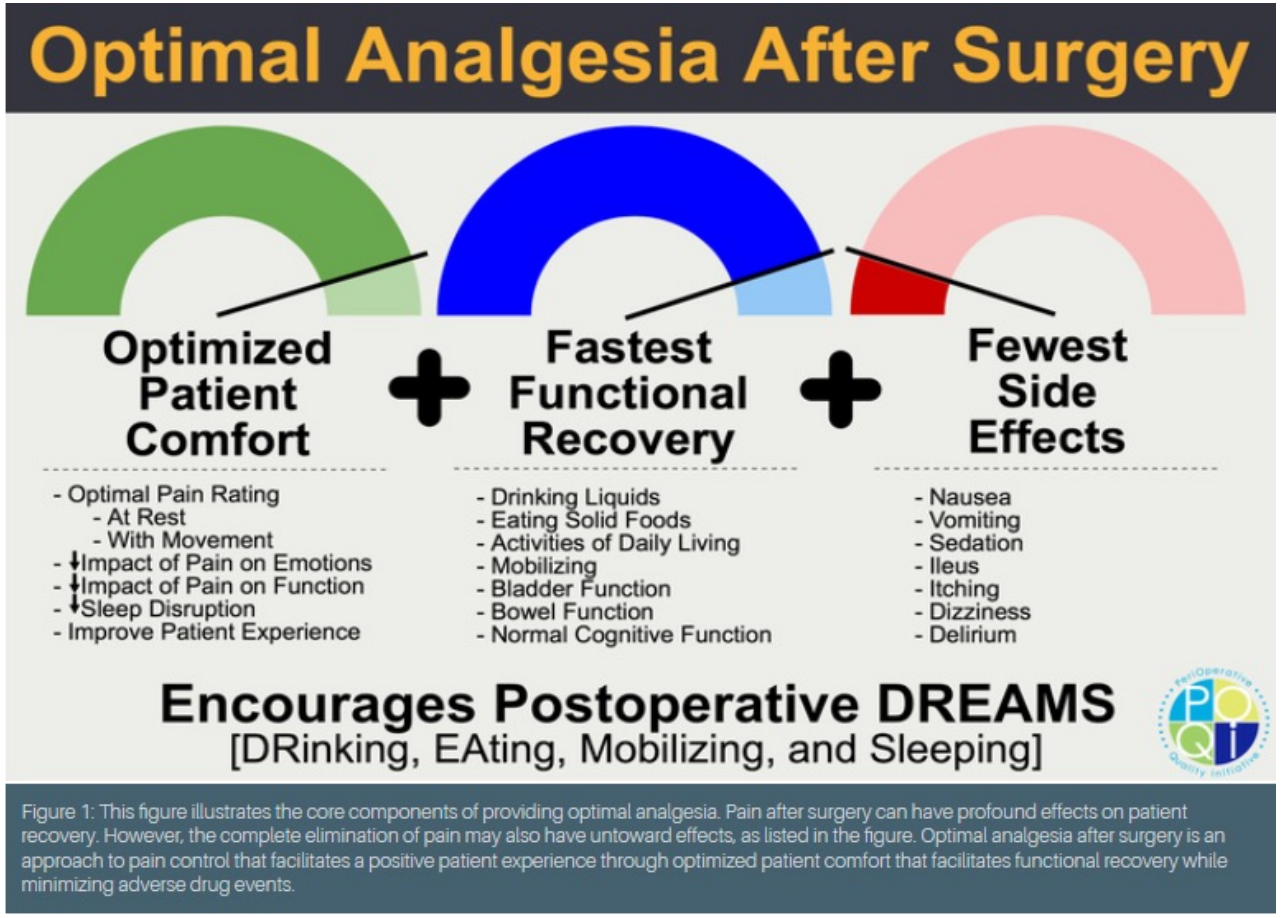

Figure 1: This figure illustrates the core components of providing optimal analgesia. Pain after surgery can have profound effects on patient recovery. However, the complete elimination of pain may also have untoward effects, as listed in the figure. Optimal analgesia after surgery is an approach to pain control that facilitates a positive patient experience through optimized patient comfort that facilitates functional recovery while minimizing adverse drug events.

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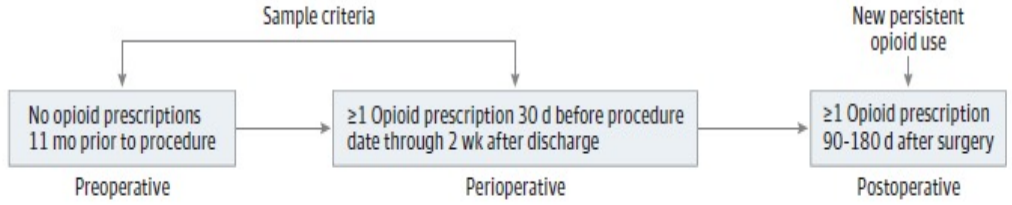
New Persistent Opioid Use After Minor and Major Surgical Procedures in US Adults

Brummett et al., 2017

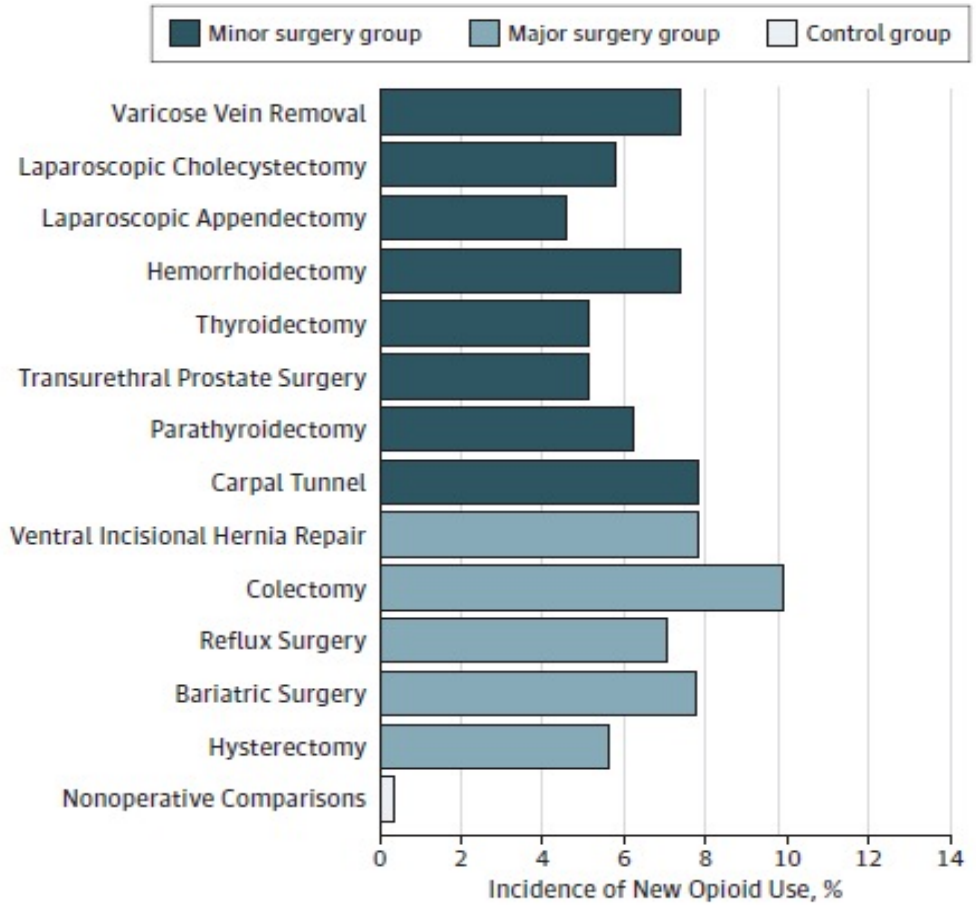
- Persistent postsurgical pain and persistent postoperative opioid prescribing definitely occur
- Incidence about 5-10% (caveat: various definitions in literature, which ranges 1-15%)
- Similar major vs minor surgical procedures

Figure 1. Sample Criteria and Outcomes



Patients undergoing the predefined surgical procedures were included if they met the following criteria: (1) continuous insurance coverage during the 12 months before the procedure through the 6 months after; (2) no opioid prescriptions during the 11 months before the procedure; and (3) at least 1 opioid prescription fulfillment during the perioperative period, which was defined as the 30 days before the procedure to 2 weeks after discharge. The outcome of new persistent opioid use was defined as at least 1 opioid prescription fulfillment between 90 and 180 days after the procedure.

Figure 3. Incidence of New Persistent Opioid Use by Surgical Condition



The incidence of new persistent opioid use was similar between the 2 groups (minor surgery, 5.9% vs major surgery, 6.5%; odds ratio, 1.12; SE, 0.06; 95% CI, 1.01-1.24). By comparison, the incidence in the nonoperative control group was only 0.4%.

JAMA Surg. 2017;152(6):e170504. doi:10.1001/jamasurg.2017.0504

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Demographics

Note this was managed care claims: largely white (70%) and well educated (75% more than high school)

Risks for persistent opioid use:

- **Young age**
  - (referent, all other ages protective RR 0.9)
- **Smoker**
  - (21-30%, RR 1.35)
- **High school**
  - (27-32%, RR 1.2)
- **Mental health disorders**
  - (anxiety (15-25%), mood (20-28%), ETOH or substance use (2-4%), RR 1.2-1.4)
- **Specific pain back, neck, arthritis**
  - (40-50%, RR 1.5)
- **Opioid prescription 30 days prior to procedure**
  - (18-20%, RR 1.9)

Table 1. Preoperative Patient Characteristics and Univariate Outcomes Analyses[a]

Characteristic	No. (%) Overall Group	Minor Surgery Cohort	Persistent Opioid Use	No Persistent Opioid Use	P Value	No. (%) Major Surgery Cohort	Persistent Opioid Use	No Persistent Opioid Use	P Value	P Value for Minor vs Major
Age, y										
18-29	4663 (12.9)	4436 (15.3)	258 (5.8)	4178 (94.2)		227 (3.2)	17 (7.5)	210 (92.5)		
30-39	7090 (19.6)	5938 (20.4)	276 (4.7)	5662 (95.4)	<.001	1152 (16.2)	88 (7.6)	1064 (92.4)	.02	<.001
40-49	10 364 (28.7)	7389 (25.4)	392 (5.3)	6997 (94.7)		2975 (41.9)	159 (5.3)	2816 (94.7)		
50-59	10 207 (28.2)	8099 (27.9)	548 (6.8)	7551 (93.2)		2108 (29.7)	151 (7.2)	1957 (92.8)		
60-64	3853 (10.7)	3206 (11.0)	237 (7.4)	2969 (92.6)		647 (9.1)	50 (7.7)	597 (92.3)		
Female	23 913 (66.1)	17 860 (61.4)	1101 (64.4)	16 759 (61.3)	.01	6053 (85.2)	385 (82.8)	5668 (85.3)	.14	<.001
Race/ethnicity										
White	26 091 (72.1)	21 388 (73.6)	1268 (74.1)	20 120 (73.6)		4703 (66.2)	300 (64.5)	4403 (66.3)		
African American	3268 (9.0)	2161 (7.4)	151 (8.8)	2010 (7.4)	<.001	1107 (15.6)	73 (15.7)	1034 (15.6)	.18	<.001
Hispanic	4283 (11.8)	3467 (11.9)	183 (10.7)	3284 (12.0)		816 (11.5)	57 (12.3)	759 (11.4)		
Asian	1076 (3.0)	865 (3.0)	27 (1.6)	838 (3.1)		211 (3.0)	9 (1.9)	202 (3.0)		
Missing/unknown	1459 (4.0)	1187 (4.1)	82 (4.5)	1105 (4.0)		272 (3.8)	26 (5.6)	246 (3.7)		
Education										
Less than high school	184 (0.5)	149 (0.5)	8 (0.5)	141 (0.5)		35 (0.5)	3 (0.7)	32 (0.5)		
High school	9781 (27.0)	7763 (26.7)	504 (29.5)	7259 (26.5)		2018 (28.4)	147 (31.6)	1871 (28.2)		
Some college	19 781 (54.7)	15 827 (54.5)	959 (56.1)	14 868 (54.4)	<.001	3954 (55.6)	254 (54.6)	3700 (55.7)	.17	<.001
College degree or more	6129 (16.9)	5097 (17.5)	223 (13.0)	4874 (17.8)		1032 (14.5)	54 (11.6)	987 (14.7)		
Missing/unknown	302 (0.8)	232 (0.8)	17 (1.0)	215 (0.8)		70 (1.0)	7 (1.5)	63 (1.0)		
Region										
East North Central	6293 (17.4)	5245 (18.0)	320 (18.7)	4925 (18.0)		1048 (14.7)	61 (13.1)	987 (14.9)		
East South Central	1452 (4.0)	1206 (4.2)	94 (5.5)	1112 (4.1)		246 (3.5)	20 (4.3)	226 (3.4)		
Middle Atlantic	2196 (6.1)	1641 (5.7)	62 (3.6)	1579 (5.8)		555 (7.8)	21 (4.5)	534 (8.0)		
Mountain	3767 (10.4)	3101 (10.7)	175 (10.2)	2926 (10.7)		666 (9.4)	38 (8.2)	628 (9.5)		
New England	992 (2.7)	780 (2.7)	42 (2.5)	738 (2.7)	<.001	212 (3.0)	9 (1.9)	203 (3.1)	.053	<.001
Pacific	2252 (6.2)	1721 (5.9)	67 (3.9)	1654 (6.1)		531 (7.5)	32 (6.9)	499 (7.5)		
South Atlantic	8279 (22.9)	6583 (22.7)	389 (22.7)	6194 (22.6)		1696 (23.9)	128 (27.5)	1568 (23.6)		
West North Central	4724 (13.1)	3878 (13.3)	220 (12.9)	3658 (13.4)		846 (11.9)	60 (12.9)	786 (11.8)		
West South Central	6198 (17.1)	4896 (16.8)	340 (19.9)	4556 (16.7)		1302 (18.3)	95 (20.4)	1207 (18.2)		
Missing/unknown	24 (0.1)	17 (0.1)	2 (0.1)	15 (0.1)		7 (0.1)	1 (0.2)	6 (0.1)		
Charlson Comorbidity Index, mean (SD)	0.83 (1.5)	0.75 (1.38)	1.00 (1.58)	0.74 (1.36)	<.001	1.14 (1.9)	1.96 (2.73)	1.08 (1.80)	<.001	<.001
History of tobacco use	8449 (23.4)	6953 (23.9)	549 (32.1)	6404 (23.4)	<.001	1496 (21.0)	128 (27.5)	1368 (20.6)	<.001	<.001
Mental health disorders										
Adjustment	1626 (4.5)	1061 (3.7)	68 (4.0)	993 (3.6)	.46	565 (8.0)	39 (8.4)	526 (7.9)	.72	<.001
Anxiety	5767 (15.9)	4487 (15.4)	376 (22.0)	4111 (15.0)	<.001	1280 (18.0)	117 (25.2)	1163 (17.5)	<.001	<.001
Mood	5856 (16.2)	4393 (15.1)	362 (21.2)	4031 (14.7)	<.001	1463 (20.6)	130 (28.0)	1333 (20.1)	<.001	<.001
Suicide or self-harm	123 (0.3)	104 (0.4)	9 (0.5)	95 (0.4)	.23	19 (0.3)	4 (0.9)	15 (0.2)	.01	.24
Disruptive	993 (2.7)	831 (2.9)	62 (3.6)	769 (2.8)	.05	162 (2.3)	11 (2.4)	151 (2.3)	.90	.007
Personality	82 (0.2)	72 (0.3)	8 (0.5)	64 (0.2)	.06	10 (0.1)	0	10 (0.2)	.40	.09
Psychosis	195 (0.5)	157 (0.5)	21 (1.2)	136 (0.5)	<.001	38 (0.5)	5 (1.1)	33 (0.5)	.10	.95
Other	1309 (3.6)	749 (2.6)	58 (3.4)	691 (2.5)	.03	560 (7.9)	36 (7.7)	524 (7.9)	.91	<.001
Alcohol or substance abuse disorders	887 (2.5)	744 (2.6)	75 (4.4)	669 (2.5)	<.001	143 (2.0)	19 (4.1)	124 (1.9)	.001	.007
Pain disorders										
Arthritis	16 781 (46.4)	13 281 (45.7)	1075 (62.8)	12 206 (44.6)	<.001	3500 (49.2)	291 (62.6)	3209 (48.3)	<.001	<.001
Back	9047 (25.0)	7283 (25.1)	672 (39.3)	6611 (24.2)	<.001	1764 (24.8)	191 (41.1)	1573 (23.7)	<.001	.67
Neck	4660 (12.9)	3841 (13.2)	361 (21.1)	3480 (12.7)	<.001	819 (11.5)	95 (20.4)	724 (10.9)	<.001	<.001
Other pain conditions	14 546 (40.2)	10 813 (37.2)	874 (51.1)	9939 (36.3)	<.001	3733 (52.5)	277 (59.6)	3456 (52.02)	.002	<.001
Opioid prescription fulfillments										
30 d before procedure	6539 (18.1)	5222 (18.0)	435 (25.4)	4787 (17.5)	<.001	1317 (18.5)	108 (23.2)	1209 (18.2)	.007	.27
Total opioid dose of prescriptions within surgical window, median (IQR), OME	225 (150)	225 (150)	225 (187.5)	225 (150)	<.001	225 (187.5)	300 (262.5)	225 (187.5)	<.001	<.001

JAMA Surg. 2017;152(6):e170504. doi:10.1001/jamasurg.2017.0504

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An International Multidisciplinary Consensus Statement on the Prevention of Opioid-Related Harm in Adult Surgical Patients

Levy et al., 2020

Pre-operative assessment

- Preexisting pain (wean opioids pre-op)
- Treat psychological comorbidities
- Set realistic expectations and how to use non-opioid analgesics and strategies

SETTING	MODIFIABLE RISK FACTORS	RECOMMENDATIONS OR RATIONALE
Pre-assessment clinic	Pre-operative opioids	Patients taking long-term opioids are more likely to develop PPOU: wean or taper opioids before surgery
	Psychological comorbidities	Psychological interventions may reduce pre-operative anxiety, depression and catastrophic thinking, thus decreasing postoperative pain and opioid requirements
	Unrealistic expectations	Educate patients and carers about pain management, including non-pharmacological strategies and safe analgesic use
Postoperative period in hospital	Reliance on unidimensional pain scores alone	Use functional outcomes to ensure that analgesic use leads to improved recovery
	Abnormal pain trajectory	Patients whose pain is not following an expected trajectory should be identified early as this may signify postoperative complications, neuropathic pain or psychological distress
	Reliance on opioid analgesia	Use multimodal analgesia and non-pharmacological techniques for pain relief
	Long-acting opioids	Avoid initiating long-acting formulations; use short-acting opioids as needed only
	Compound opioids	Do not prescribe compound tablets: give each drug separately
Preparation for discharge	Over-emphasis on opioids for discharge medication	Educate patients and carers to use multimodal analgesia and non-pharmacological techniques for pain relief
	Large number of opioid tablets	Limit the number of tablets given at discharge
	Long duration of discharge opioid prescription	Limit the duration of opioids given at discharge
	Lack of deprescribing advice	Educate patients and carers about reducing analgesia (opioids first)
Post-discharge	Repeat prescriptions	The risk of PPOU increases considerably with each repeat prescription: review the patient before dispensing more opioids
	Chronic postsurgical pain	Refer to a pain service if pain exceeds expected healing time
	Unsafe storage of opioids at home	Unsecured opioids risk unintended overdose or diversion
	Unsafe disposal of unused opioids	Educate patients and carers about safe disposal of unused opioids

Figure 2 Modifiable risk-factors and suggested recommendations or rationale for persistent postoperative opioid use (PPOU).

Anaesthesia 2020

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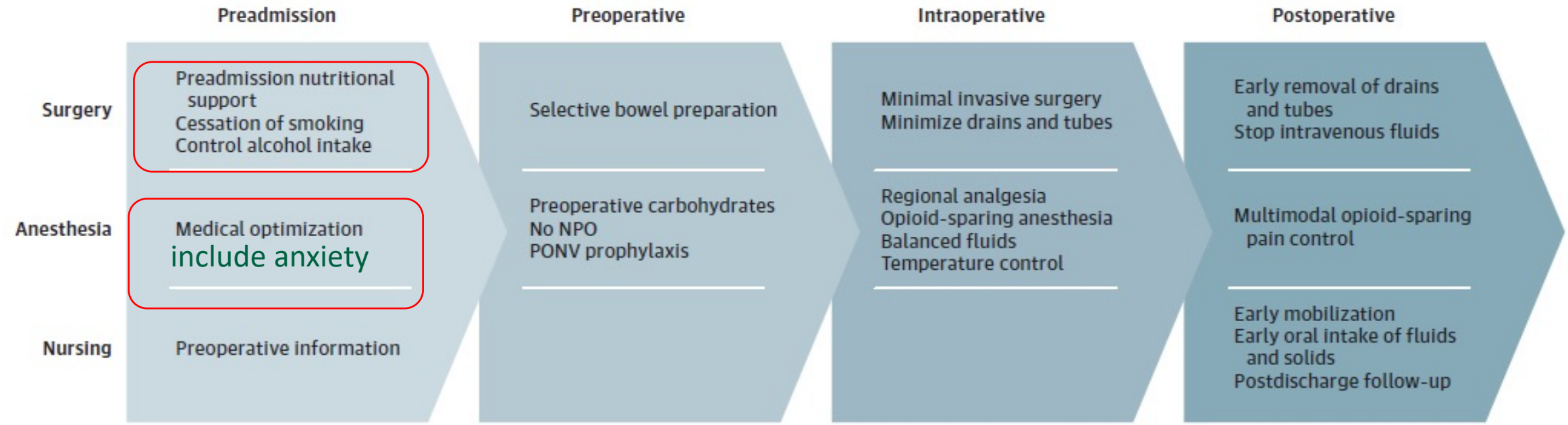
Enhanced Recovery After Surgery (ERAS): A Review

Ljungqvist et al., 2017

- ERAS: Careful surgical planning starting well before surgery
- Opioid prescribing plan after procedure starts pre-operatively
- Pre-op: Set functional goals and expectations for recovery

Figure. Enhanced Recovery After Surgery (ERAS) Flowchart



JAMA Surg. 2017;152(3):292-298. doi:10.1001/jamasurg.2016.4952
Published online January 11, 2017.

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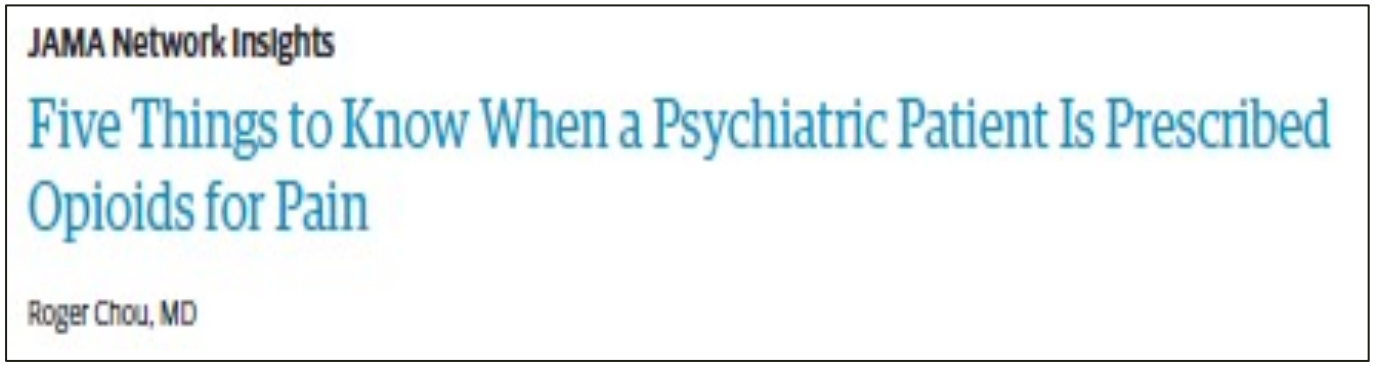
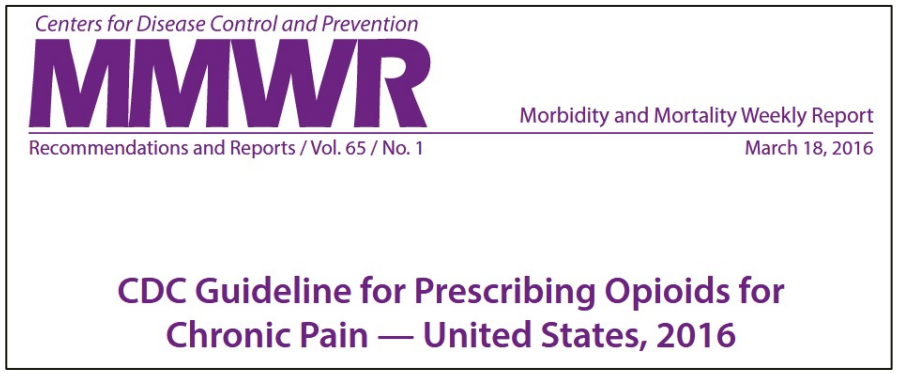

JAMA Network Insights

Five Things to Know When a Psychiatric Patient Is Prescribed Opioids for Pain

Roger Chou, MD


Centers for Disease Control and Prevention

MMWR

Morbidity and Mortality Weekly Report

Recommendations and Reports / Vol. 65 / No. 1 March 18, 2016

CDC Guideline for Prescribing Opioids for Chronic Pain — United States, 2016

1. Psychological therapies are a vital treatment option for chronic pain
2. Psychiatric conditions, such as depression, anxiety, and posttraumatic stress disorder, are common in patients with chronic pain
3. Pain is often compounded by insomnia and other sleeping disorders
4. Concurrent use of alcohol and opioids is common
5. It is important to remain vigilant to opioid use disorder (OUD) and misuse potential

JAMA Psychiatry February 2021 Volume 78, Number 2

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Effects of Psychological Interventions on Anxiety and Pain in Patients Undergoing Major Elective Abdominal Surgery: A Systematic Review

Villa et al., 2020

- Cognitive Behavioral Therapy
- Relaxation
- Mindfulness
- Coping
- Hypnosis
- Narrative Medicine

Overall, pre-operative intervention helped reduce anxiety and distress related to surgery (other endpoints unknown)

Villa *et al. Perioperative Medicine* (2020) 9:38
https://doi.org/10.1186/s13741-020-00169-x

Table 2 Summary of the relevant surgical outcomes observed in the selected studies. Methods and scales used for outcome measurements appear in brackets

Years	First author	Sample size (pts)	Type of study	Type of intervention	Type of population	Relevant findings
2003	Roykulcharoen V et al. (2004)	102	RCT	Relaxation therapy	Abdominal surgery	Relaxation less sensation and distress of pain (56 vs 5%)
2005	Lin L et al. (2005)	62	RCT	Coping strategies	Abdominal surgery	Coping less anxiety and pain
2010	Good M et al. (2010)	517	RCT	Relaxation therapy	Abdominal surgery	Relaxation less pain
2012	Broadbent E et al.(2012)	60	RCT	Relaxation therapy	Laparoscopic cholecystectomy	Relaxation less anxiety and stress
2013	Zhang X et al. (2013)	60	RCT	Coping strategies and behavioural therapies	Oesophageal cancer	Coping and CBT less anxiety and stress
2013	Rejeh N et al. (2013)	124	RCT	Relaxation therapy	Abdominal surgery	Relaxation less pain, anxiety, and opioid use
2015	Hansen M et al. (2015)	105	RCT	Relaxation therapy	Abdominal and urological one day surgery	Relaxation no change in pain or anxiety
2015	Hizli F et al. (2015)	64	RCT	Hypnosis	TRUS-Guided Prostate Needle Biopsy	Hypnosis less pain and anxiety
2019	Sockalingam S et al. (2019)	43	Observational prospective pre/post study	Cognitive behavioural therapies	Abdominal surgery	Tele-CBT less distress and anxiety

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Transitions of Care for Postoperative Opioid Prescribing in Previously Opioid Naïve Patients in the USA: A Retrospective Review

Klueh et al., 2018

- 5276 opioid-naïve patients who developed new persistent opioid use
- First 3 months post-op: opioids from surgeons (red line)
- After that: PCP and other specialties (purple line)
- Coordinated transitions of care are critical

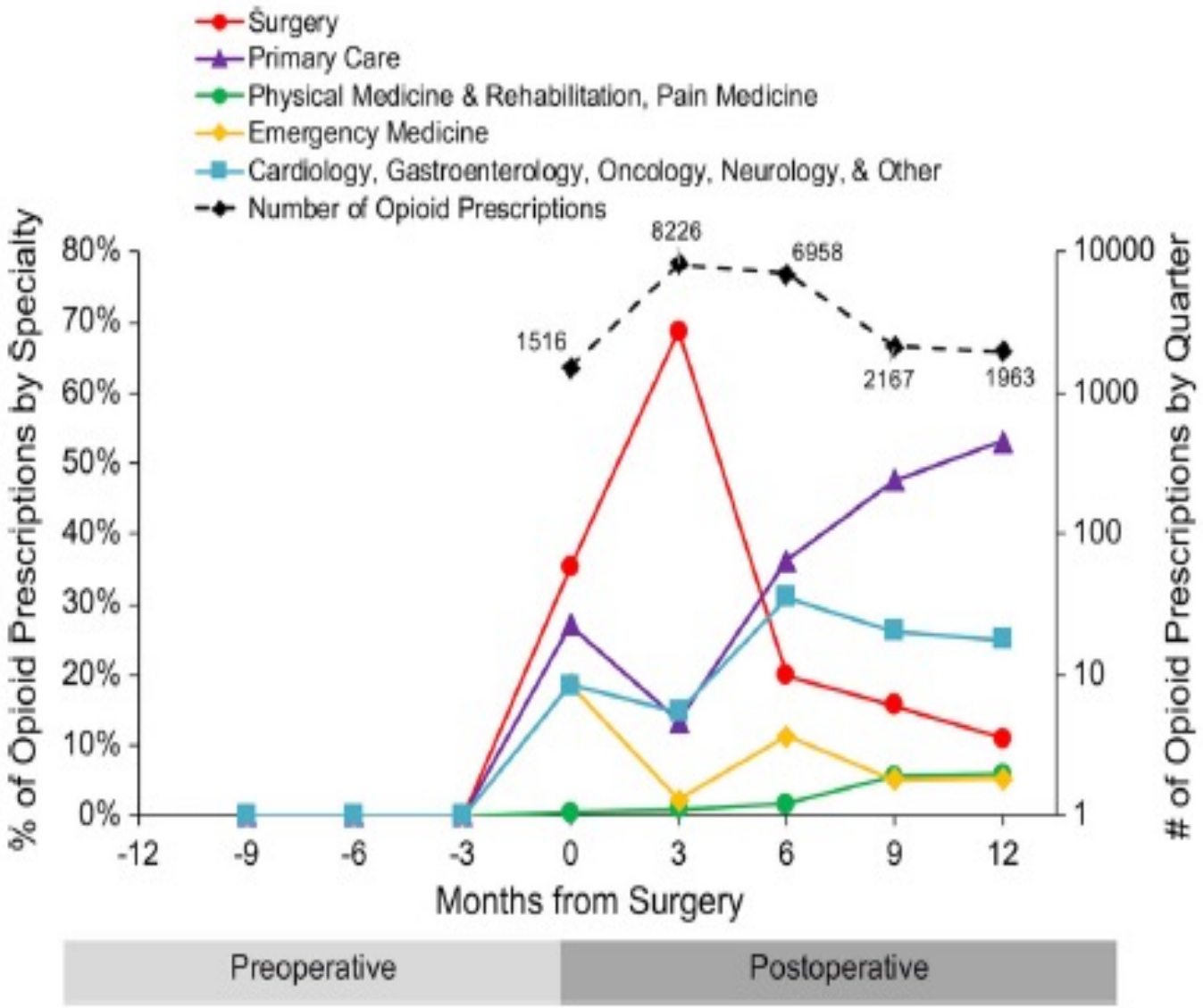

Fig. 1 Prescriber specialty for opioid prescriptions among patients with new persistent opioid use. Among opioid-naïve patients with new persistent opioid use, the majority of postoperative opioid prescribing transitioned from surgeons to primary care clinicians between 3 to 6 months after surgery. Cardiology, Gastroenterology, Oncology, Neurology, and Other provided 25–31% of prescriptions beyond 3 months after surgery. PM&R/Pain Medicine provided less than 6% of prescriptions in the study period. Emergency medicine reached 11% of prescriptions at 6 months after surgery. The highest amount of opioid prescriptions were prescribed in the first 3 months after surgery (*n*=

J Gen Intern Med 33(10):1685–91
DOI: 10.1007/s11606-018-4463-1

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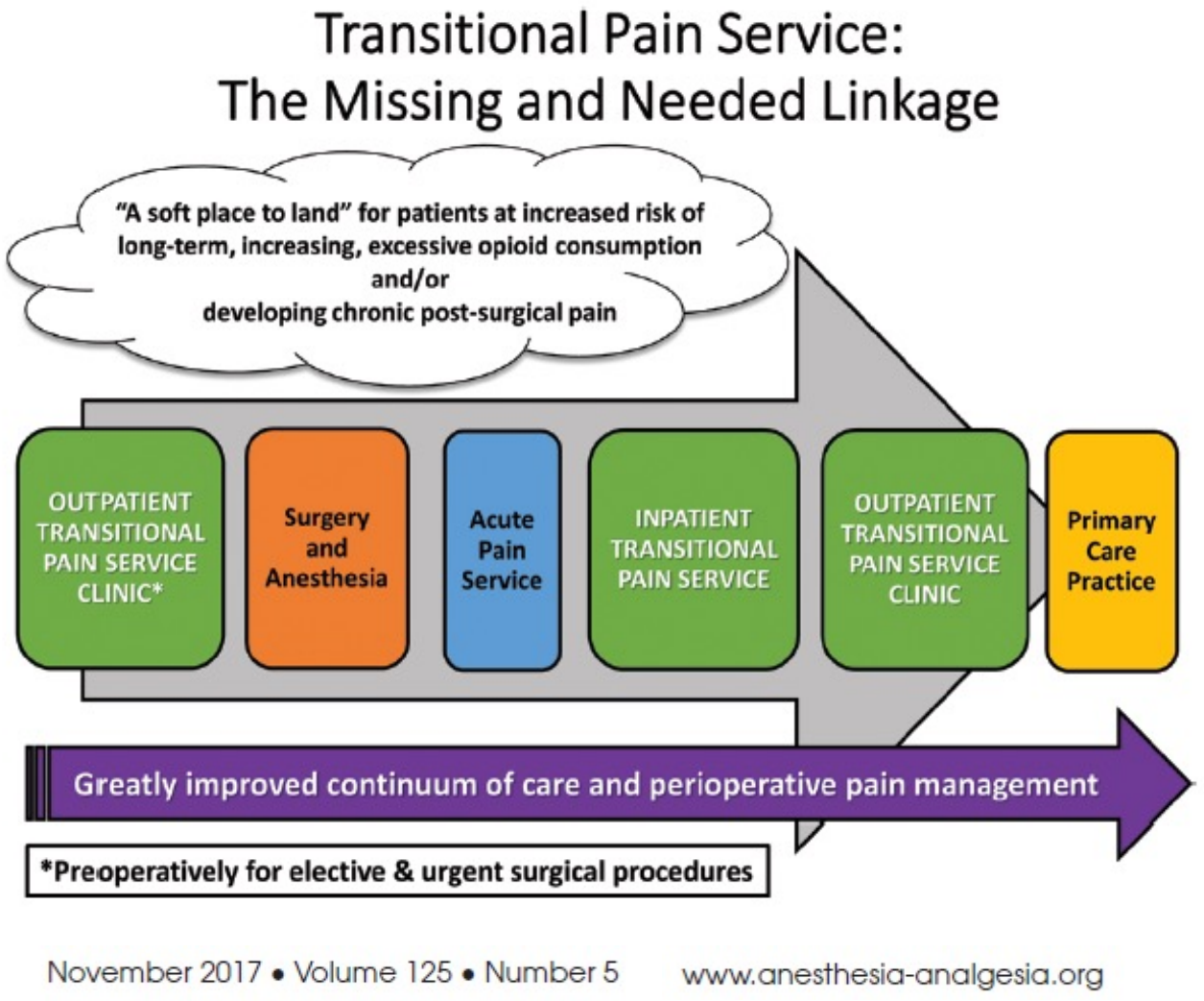
Role of the Perioperative Surgical Home in Optimizing the Perioperative Use of Opioids

Thomas et al., 2017

Transitional pain service: Acute post-operative period through until pain resolved

- Coordination and collaboration of pain control should start pre-operatively and follow through to PCP or long-term pain management provider
- You might be the person that has to initiate this conversation with the surgical team if a patient is having surgery (ie: do not expect the surgical team to do this (yet))



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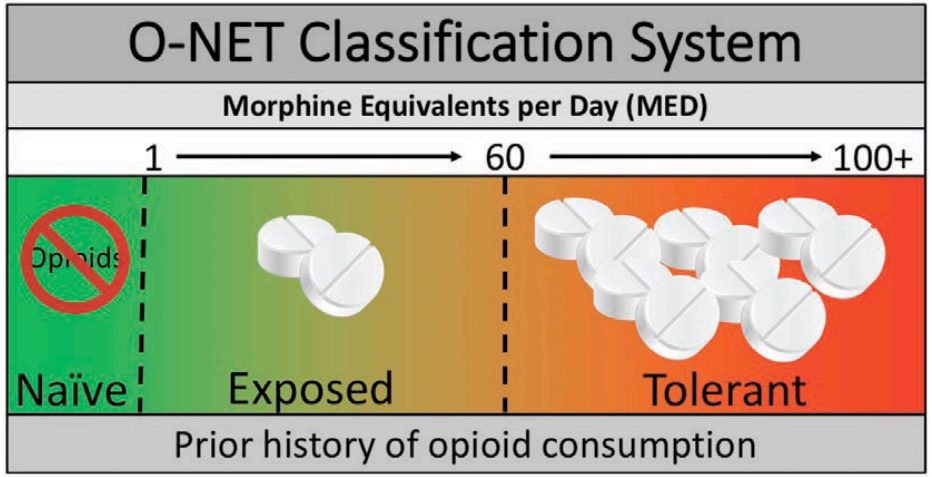
American Society for Enhanced Recovery and Perioperative Quality Initiative Join Consensus Statement on Perioperative Management of Patients on Perioperative Therapy

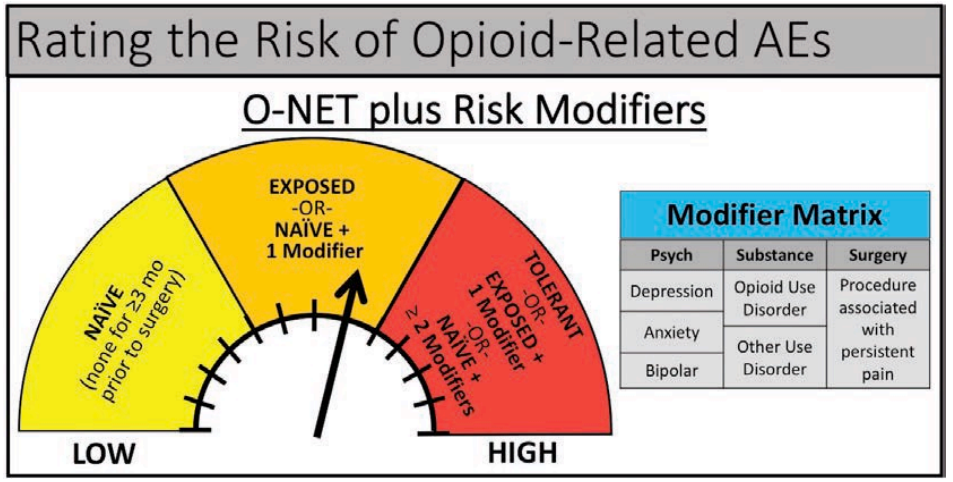
Edwards et al., 2019

Consensus and Recommendations

How do we categorize and define opioid use in the preoperative patient?

- We recommend categorizing patients as O-NET.
  - **O**pioid-**N**aive, **E**xposed, **T**olerant
- We suggest defining opioid-naïve as no history of opioid use in 90 d before surgery.
- We suggest defining opioid exposed as history of >0 morphine equivalent dose and <60 mg morphine equivalent dose within the past 90 d.
- We recommend defining opioid tolerant as history of ≥60 mg morphine equivalent dose in the past 7 d.





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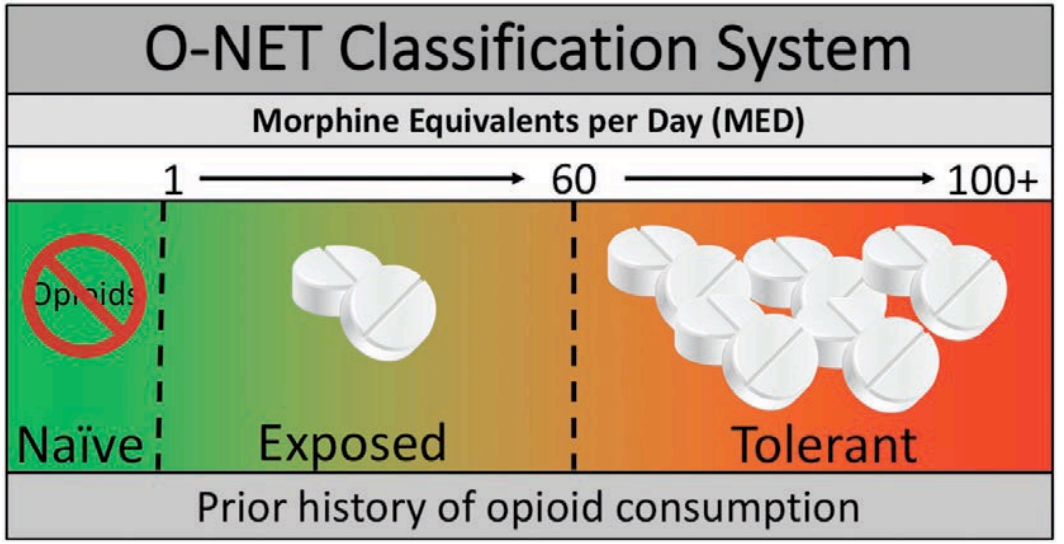
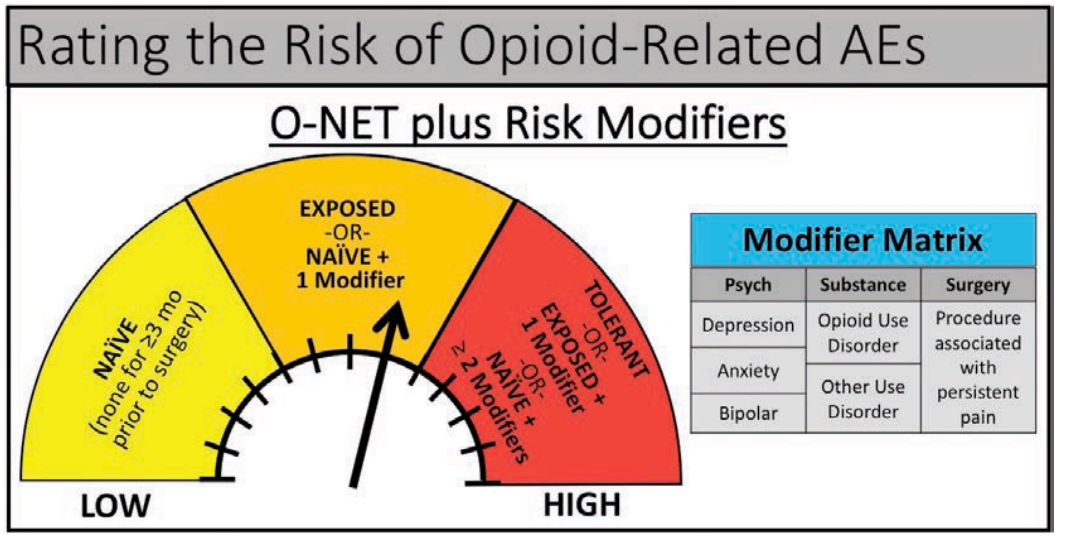
Consensus And Recommendations

How should patients be risk stratified preoperatively for opioid-related adverse events and poor outcomes?

- We recommend use of the new O-NET+ classification scheme to categorize patients into low-, moderate-, and high-risk groups (Figure 1).





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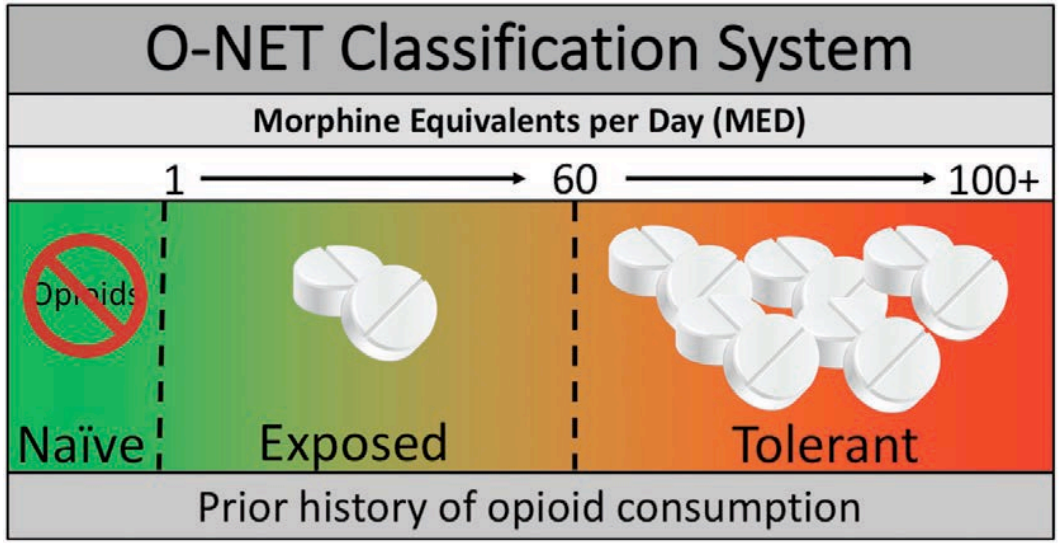
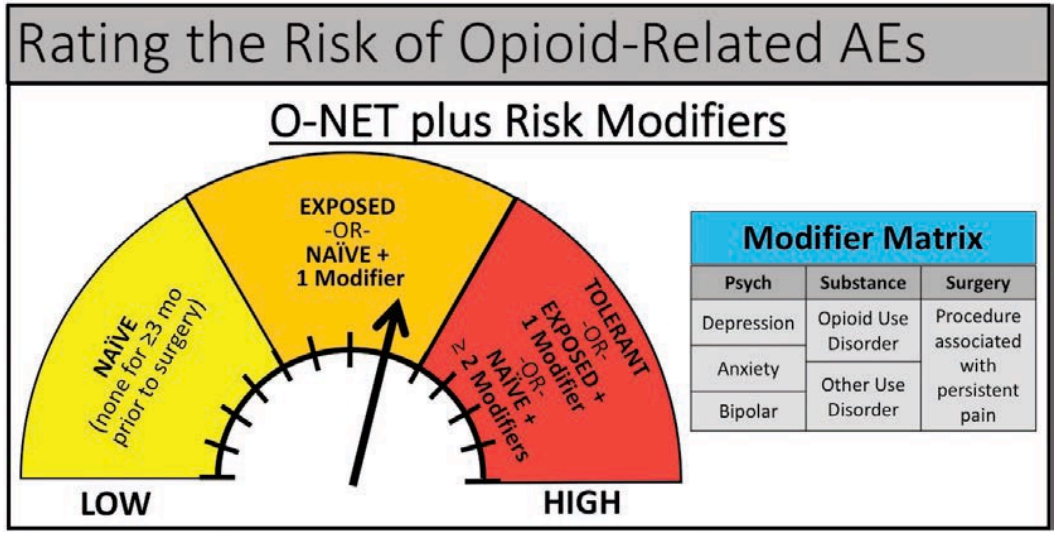
Consensus and Recommendations

How do we optimize moderate- to high-risk patients according to O-NET+ criteria before surgery?

- We suggest weaning opioids preoperatively to the lowest ***effective dose***.
- We recommend optimizing management of psychosocial comorbidities before surgery.
- We recommend individualized preoperative education to promote shared pain management expectations.
- We recommend identification of and communication with the patient's outpatient opioid prescriber to anticipate discharge needs.
- We recommend referral to a perioperative pain specialist before surgery for highest-risk patients.





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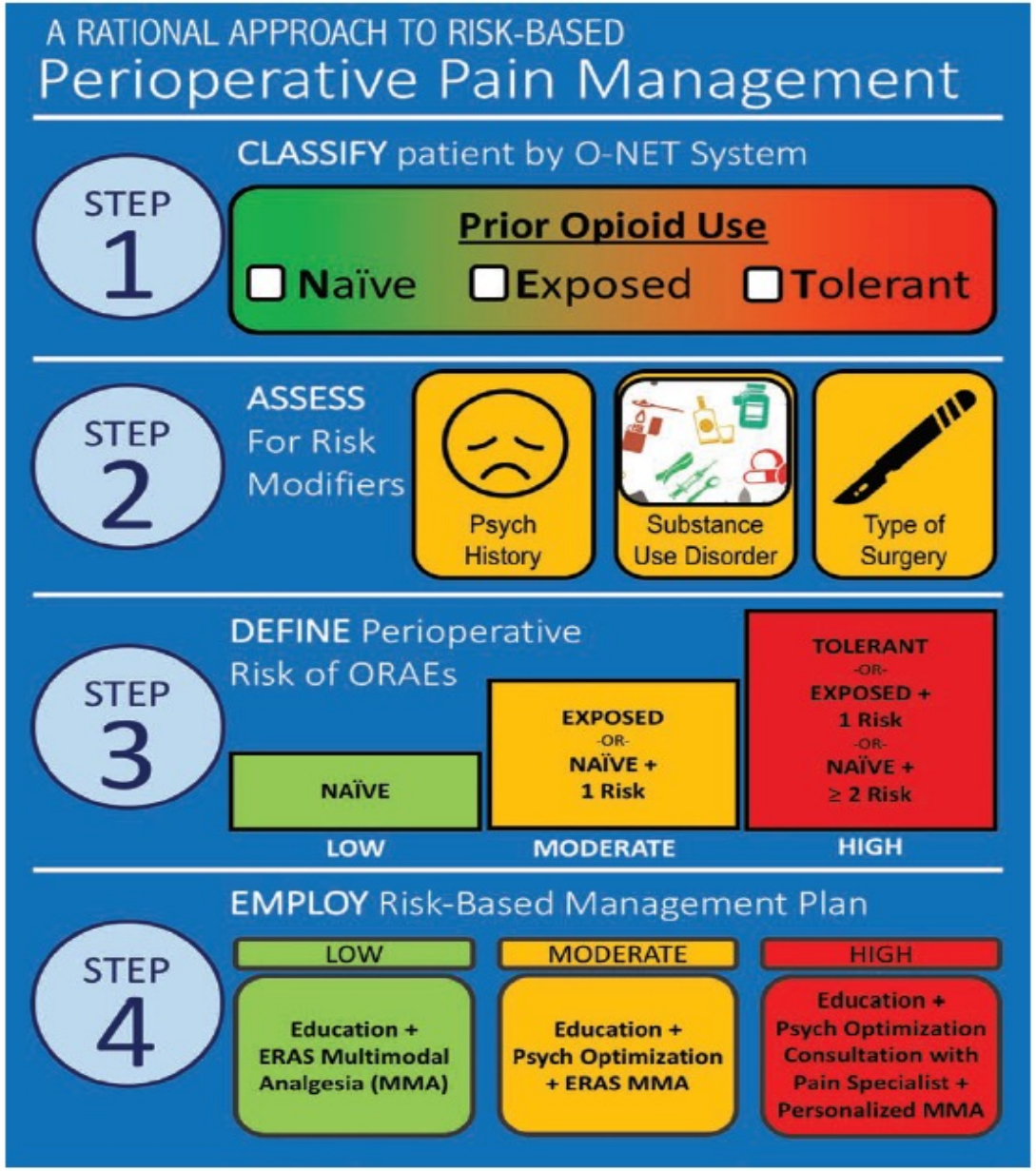
Consensus and Recommendations

What are strategies for perioperative pain management in moderate- to high-risk patients according to O-NET+ criteria?

- We strongly recommend an individualized multimodal analgesia pain management strategy, including regional/neuraxial anesthesia, when appropriate, to minimize the use of opioids.

Is opioid-free intraoperative management feasible in moderate- to high-risk patients according to O-NET+ criteria?

- ***Opioid-free intraoperative management*** is feasible, and we suggest that it may be appropriate; however, there are ***insufficient data to recommend it***.



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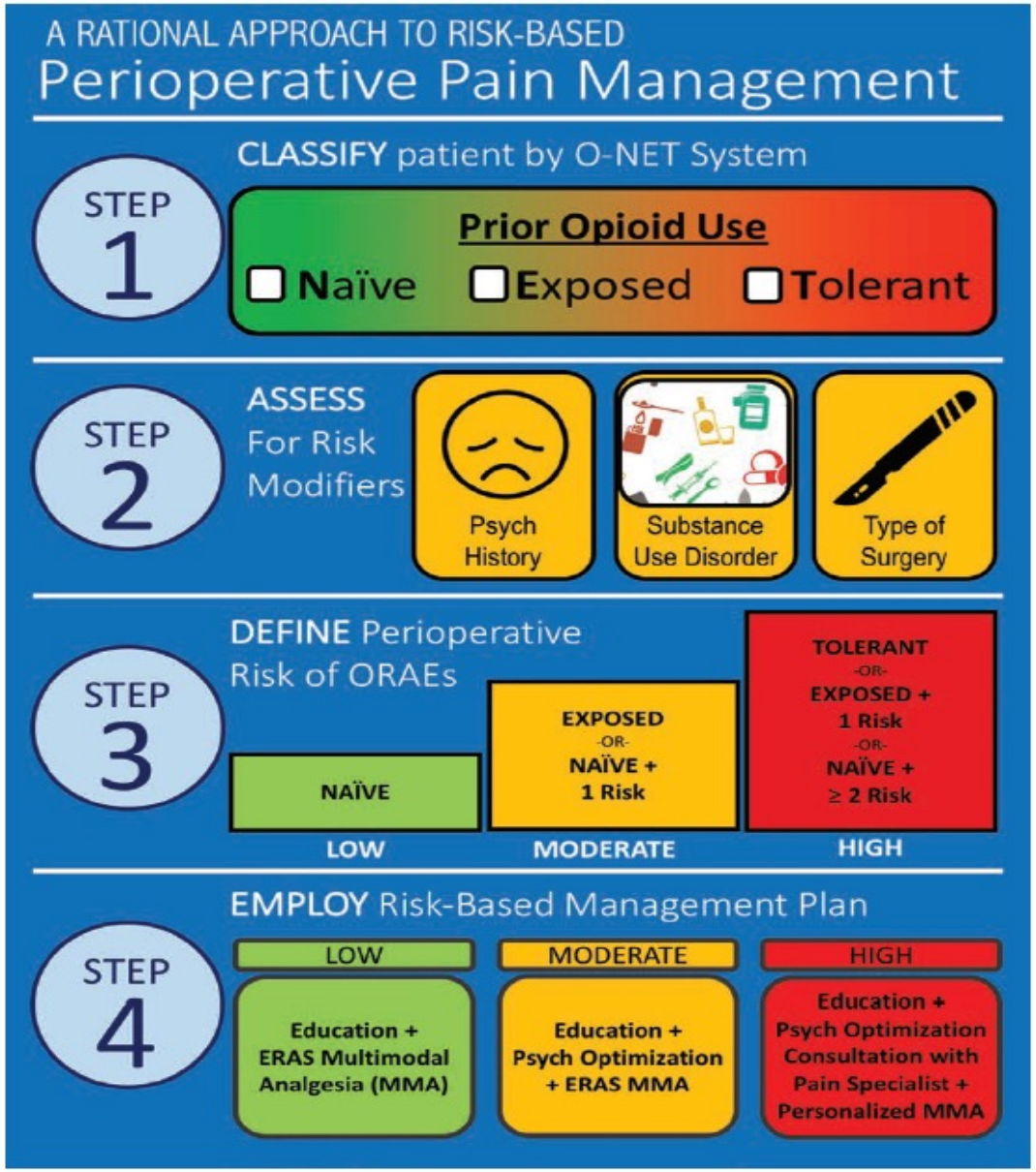
Consensus and Recommendations

What are strategies for managing postoperative pain in moderate- to high-risk patients according to O-NET+ criteria?

- We strongly recommend the routine use of non-opioid options as part of a comprehensive multimodal analgesia perioperative analgesia plan.
- We recommend the ***lowest effective opioid*** dose in the postoperative period.
- We recommend avoiding opioid dose escalation.
- We recommend the addition of opioids only in the setting of suboptimal analgesia after first-line administration of non-opioid options.
- We strongly recommend the use of non-pharmacological treatments of pain.



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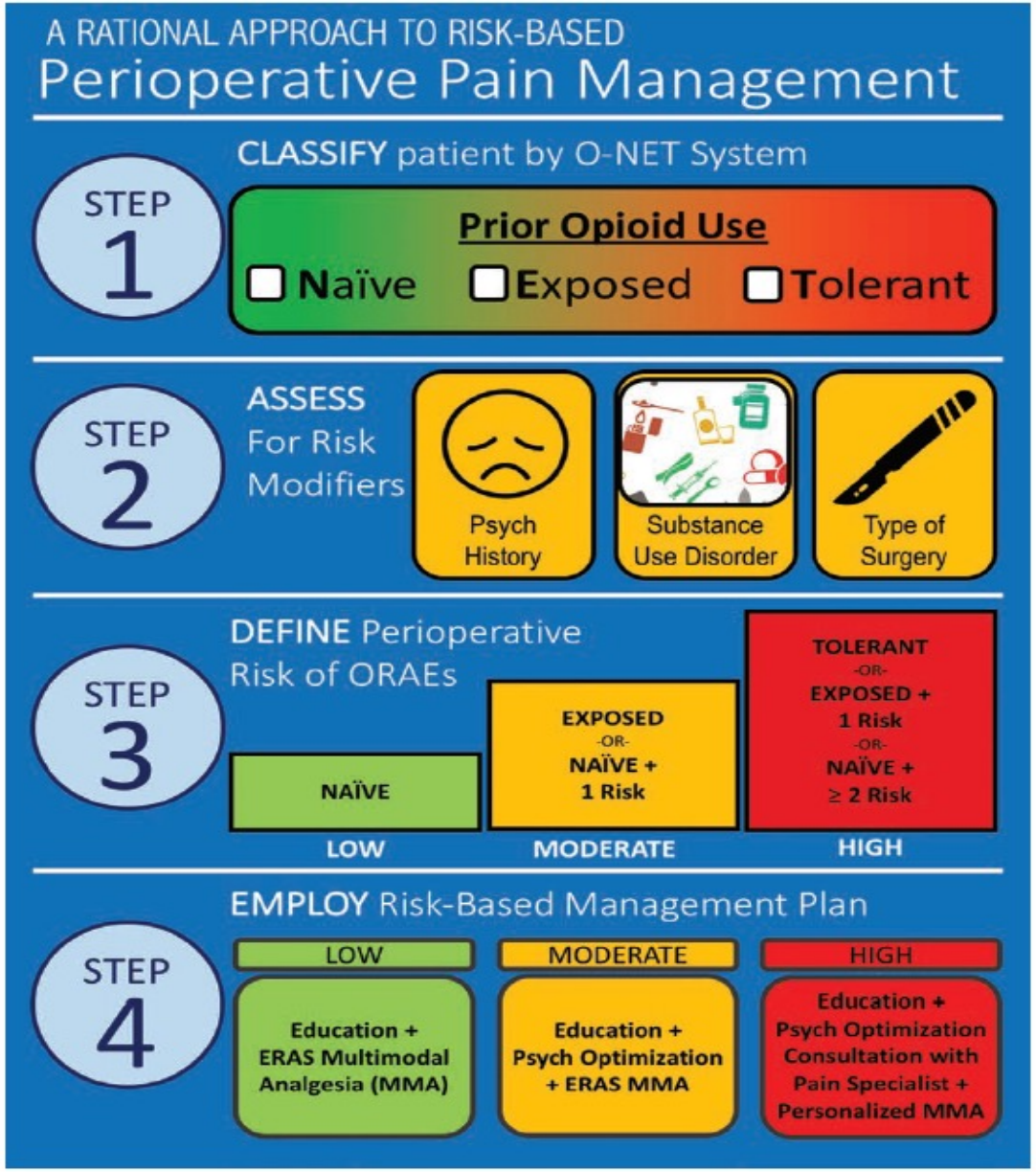
Consensus and Recommendations

What are strategies for managing postoperative opioids at discharge in moderate- to high-risk patients according to O-NET+ criteria?

- We strongly recommend ***limiting*** discharge opioid prescription to the expected duration of pain that is severe enough to require opioids.
- We recommend ***postoperative coordination*** of opioid tapering with the patient's outpatient provider.



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Opioid Use Disorders: Perioperative Management of a Special Population

Ward et al., 2018

Consensus

- If patient has SUD, need collaborative approach with SUD treatment provider
- Involve the Anesthesia Pain Service and create a multimodal plan
- In general, MOUD with methadone or buprenorphine should be continued and the anesthesia plan incorporated into that use. MOUD is NOT analgesic although can consider split dosing to improve analgesic contribution

Table 1. Perioperative Pain Management of Patients With OUD in Remission Without Medication

	Preoperative Planning	Inpatient Management	Discharge Planning
Patients with OUD in remission	High risk for relapse Involve patient and support person for pain management planning, provide education, and discuss risk of relapse Consider SUD consult	Consider nonopioid medications Consider adjuncts therapies Consider APS and SUD consult	Arrange follow-up with SUD clinic Maximize strategies for relapse prevention Close follow-up for pain management Consider OPENP

Abbreviations: APS, acute pain service; OPENP, overdose prevention education and naloxone prescription; OUD, opioid use disorder; SUD, substance use disorder.

Table 2. Perioperative Pain Management of Patients With OUD on Methadone

	Preoperative Planning	Inpatient Management	Discharge Planning
Patients with OUD on methadone	Contact methadone clinic Involve patient, methadone clinic, and support person for decisions, and provide education Consider SUD consult	Continue methadone Consider adjunct nonopioid and short-acting opioids for pain Avoid partial opioid agonists	Continue methadone Provide last methadone dose verification letter Clear instructions for pain medication management and opioid taper and follow-up Consider OPENP

Table 3. Perioperative Pain Management of Patients With OUD on Buprenorphine–Naloxone

	Preoperative Planning	Inpatient Management	Discharge Planning
Patients with OUD on bup-nx	Contact bup-nx provider Involve patient, provider, and support person for decisions regarding bup-nx and pain management Consider APS/SUD consult	Continue bup-nx if minimal to no pain is expected Consider adjuncts—NSAIDs, acetaminophen, dividing bup-nx dose 3–4 times a day Continue bup-nx for moderate to severe pain Consult APS for PCA Consider regional anesthesia Close nursing monitoring Maximize adjuncts—dexmedetomidine, acetaminophen around the clock, gabapentin/pregabalin If bup-nx has been discontinued, consider SUD consult Consider methadone or ER/LA opioids for OUD to avoid withdrawal and cravings	Coordinate with bup-nx provider for follow-up Clear instructions for pain medications and follow-up Consider OPENP

Abbreviations: APS, acute pain service; bup-nx, buprenorphine–naloxone; ER/LA, extended release/long acting; NSAIDs, nonsteroidal anti-inflammatory drugs; OPENP, overdose prevention education and naloxone prescription; OUD, opioid use disorder; PCA, patient-controlled analgesia; SUD, substance use disorder.

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Opioid Use Disorders: Perioperative Management of a Special Population

Ward et al., 2018

Table 5. Perioperative Pain Management of Patients With OUD on Injectable Naltrexone

	Preoperative Planning	Inpatient Management	Discharge Planning
Patients with OUD on injectable naltrexone	Contact naltrexone provider	For elective surgeries, consider close observation to monitor response to opioids.	Coordinate with provider for restart of naltrexone
	Involve patient, provider, and support person for decisions regarding pain management, discuss risk of relapse	Consider adjuncts	Consider OPENP
	Stop naltrexone presurgery >72 h for tablet >4 wk for injection	For emergency surgery, consider pain management with nonopioid strategies such as regional anesthesia and analgesia, systemic nonopioid agents, and nonpharmacological interventions	
	Consider APS, SUD consult		

Abbreviations: APS, acute pain service; OPENP, overdose prevention education and naloxone prescription; OUD, opioid use disorder; SUD, substance use disorder.

- Stop naltrexone
- Includes patients treated for alcohol use disorder
- Pain control can be considerably more complicated
- Coordinate for multimodal treatment
- Restart when pain control acceptable without opioids

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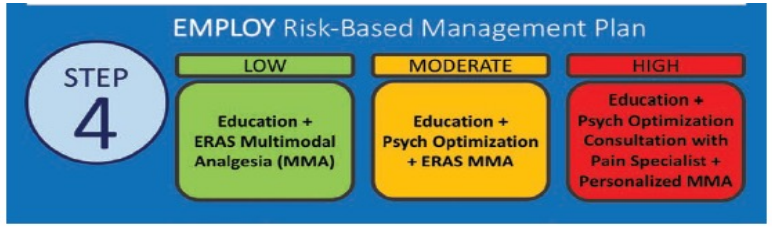
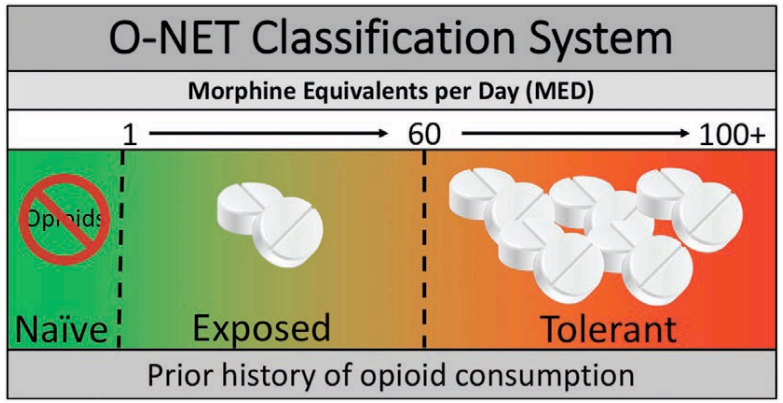
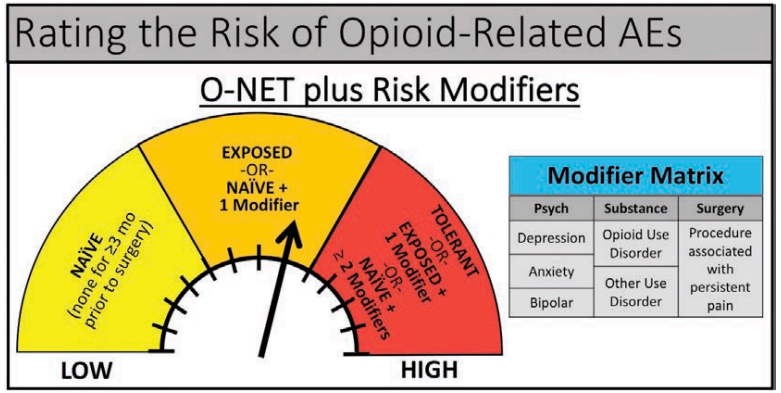
Approach to the patient on MOUD requiring surgery







Facts

- Patients on MOUD require this medication for their health and to decrease mortality
- Patients on MOUD are opioid tolerant
- Pain control is an important part of the surgical procedure and is more difficult to control in opioid tolerant individuals, requiring higher doses
- Multimodal analgesia can reduce postoperative pain (includes many non-opioid options)
- You will occasionally be wrong and create harm in this high-risk population regardless of approach

Theory

- Pain in surgical patients treated with buprenorphine is worse than those on methadone (there is no evidence that supports, there are cohort studies that dispute)
- Short term reduction in dose will improve pain control (unclear if such short-term reduction matters)
- Reduction of MOUD for surgical preparation may increase risk of relapse in the perioperative period

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Keys to appropriate safe opioid prescribing: avoid overprescribing and persistent post operative opioid use (and possibly chronic postoperative pain)

Avoid over prescribing:

- **Plan pre-operatively:** treat anxiety, alcohol and smoking behaviors, set realistic recovery expectations, both functional and pain (expectation of not pain is not realistic)
- Talk to the surgeon about concerns re: pain control and opioid exposure
- Shared decision making at discharge: amount and duration based on use day prior to discharge
- Limitation of discharge prescriptions to 3-5 days (especially outpatient surgery)
- Plan for a follow-up (prior to procedure) and how to get refills if needed
- If you are prescribing long term opioids for a patient undergoing surgery, have a very specific transitional pain plan

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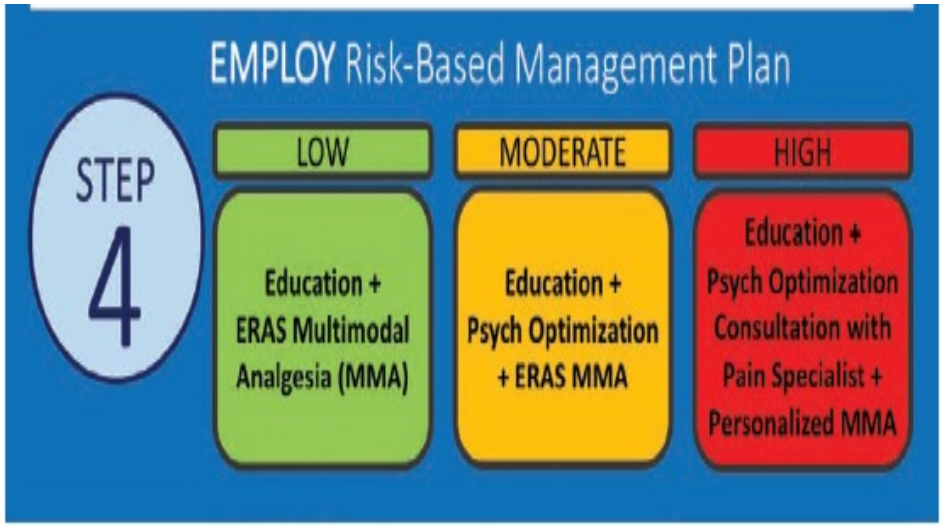
Avoid persistent opioid prescribing due to persistent post surgical pain:

- Assess risk and plan peri-operative support
- Avoid acute (first prescription) overprescribing
- Set functional recovery expectations
- If you are seeing a patient that has had surgery, insist on a transition plan with surgeon and/or anesthesiologist

Work with anesthesiologist and surgeon to create *transitional care* for complicated high-risk patients:

- You are the expert for this patient to weigh benefits and risks
- Request transition meeting prior to surgery and afterward
- If multimodal pain management not available at the (smaller) hospital, consider hospital with optimal resources



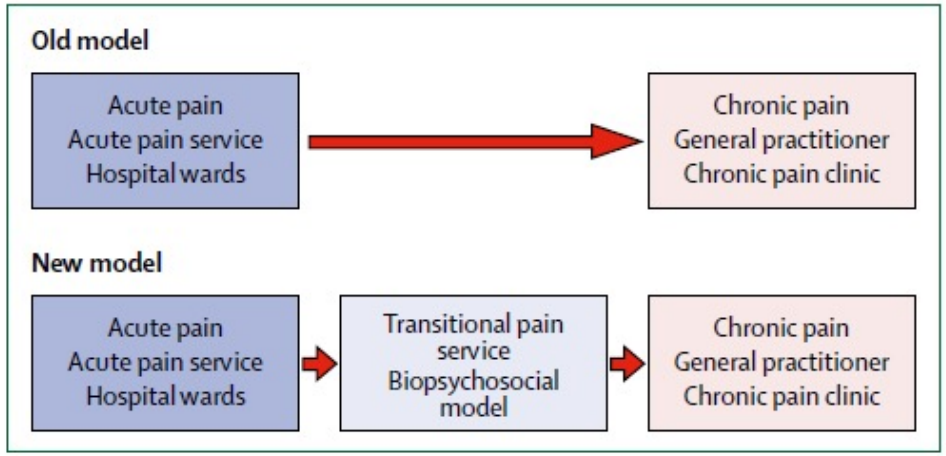


Figure 2: **A transitional pain clinic model**
Care in hospital and after discharge pathways.

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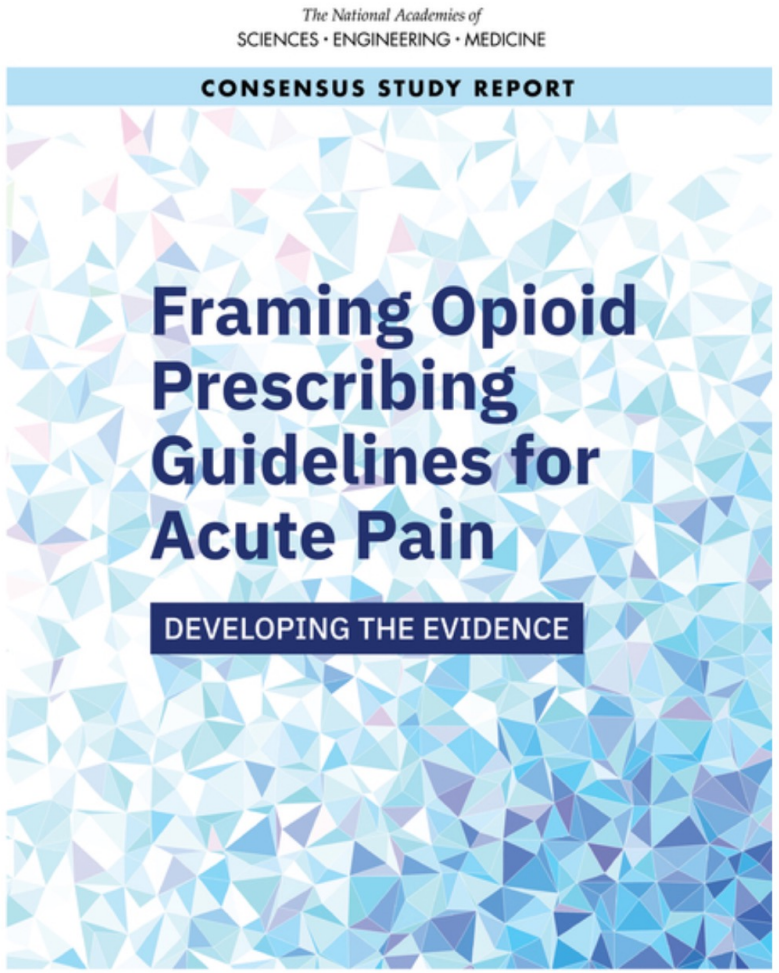

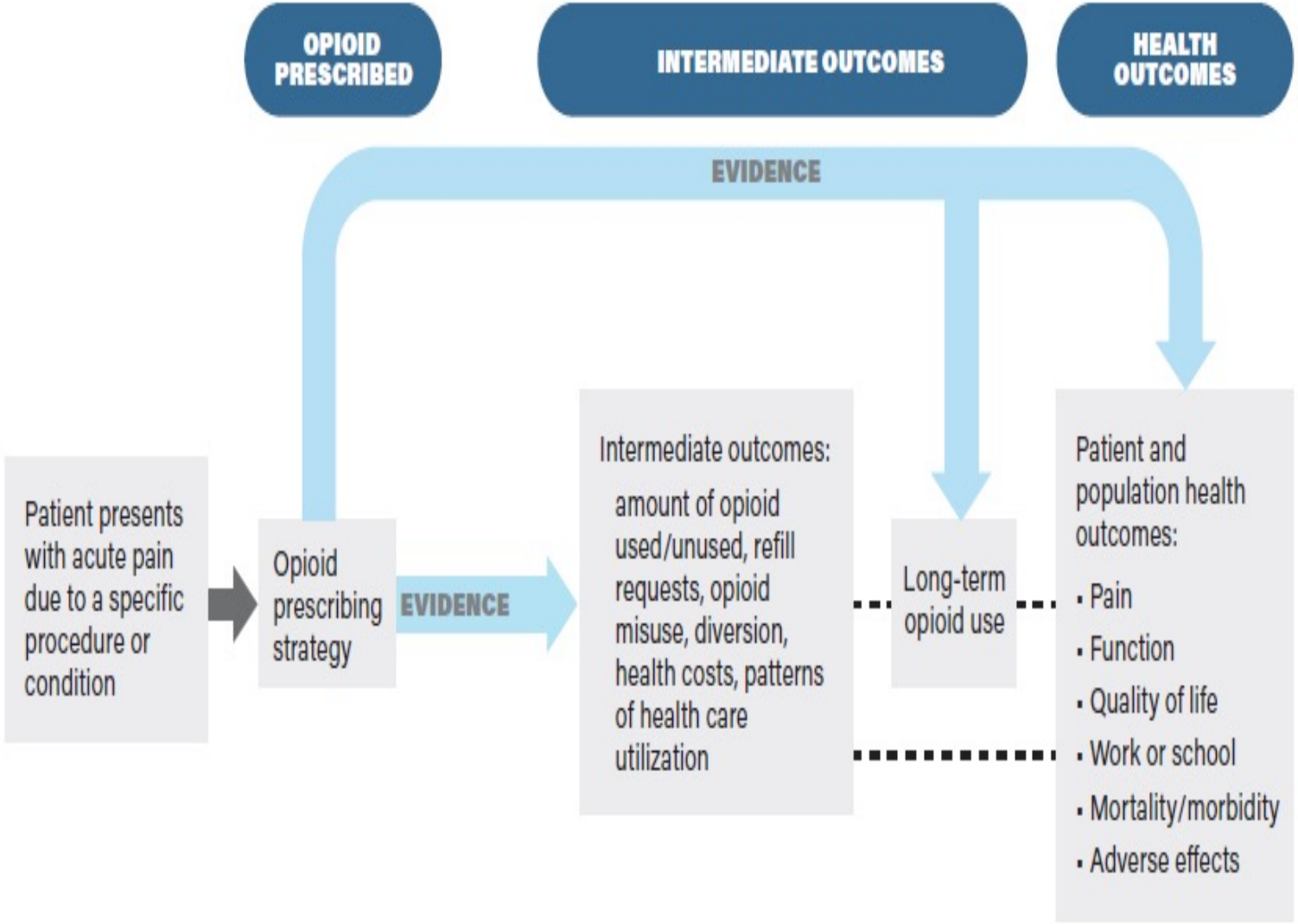

For research or guideline creation, consider using this framework to define outcomes

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Conclusions

- Surgeons overprescribe opioids
- The amount of opioid prescribed can be reduced without increased pain or dissatisfaction
- While pain control can be more difficult in patients on chronic opioids/MOUD, there are multimodal approaches for most surgical procedures to minimize opioid needs
- **You are the expert for the patient** in many cases: develop transitional pain plan with surgeon and anesthesia team

Unused opioids are dangerous

- Teens in the house
- Burglary
- Persistent use
- Should be kept in a locked area at all times

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Questions?

Email us at cora@uvm.edu

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Thank you participating in this
UVM CORA Community Rounds Workshop Series

Our next session will be held on
Wednesday, April 7th 12-1pm ET

Identifying Bias and Addressing Stigma in the Clinical Setting

Peter Jackson, MD

Contact us at CORA@uvm.edu // Center on Rural Addiction: https://uvmcora.org/
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