OPERATED
Perioperative opioid risk assessment tool from ICSI

Charles Reznikoff, MD

Hennepin Healthcare

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ICIS perioperative guideline available for public comment

https://www.icsi.org/guidelines/

https://www.icsi.org/guideline/perioperative-protocol/

Case: Opioids and Surgical Risk

- 70-year-old woman being evaluated for left TKA
- She has post-traumatic arthritis from a femur fracture (car accident) decades ago
- She has anxiety, treated with fluoxetine; and FUCH's dystrophy (corneal disease) S/P successful corneal transplant years ago.
- She's a retired lawyer, lives with husband in St. Paul, MN
- She drinks 2 alcoholic beverages on a typical day
- No other drugs. No tobacco.
- Psychical exam, vitals, labs unremarkable

Which perioperative opioid risk occurred in this patient?

- 1. Postoperative fall
- 2. Addiction to opioids
- 3. Postoperative delirium
- 4. Opioid-induced respiratory compromise

What happened in this case

- On postoperative day 1 a code was called because she “stopped breathing” with O2 sat 84%
- She was having an OSA episode provoked by opioids
- No prior dx of OSA
- Because of the alcohol and anxiety I was worried about opioid related problems
- She used postop oxycodone minimally with no adverse effect

OPERATED

mnemonic for perioperative opioid risk

- **O**pioid Problems (Addiction, OD, Chronic pain)
- **P**sychiatric Comorbidities
- **E**limination of Drug
- **R**espiratory Compromise
- **A**dverse Reactions, Expected
- **T**rouble Medications
- **E**arly Mobility and falls
- **D**elirium

Reznikoff, “Perioperative Guideline” Institute for Clinical Systems improvement (ICSI) 2019 P.42 currently open for public comment

O for “Opioid Problems”

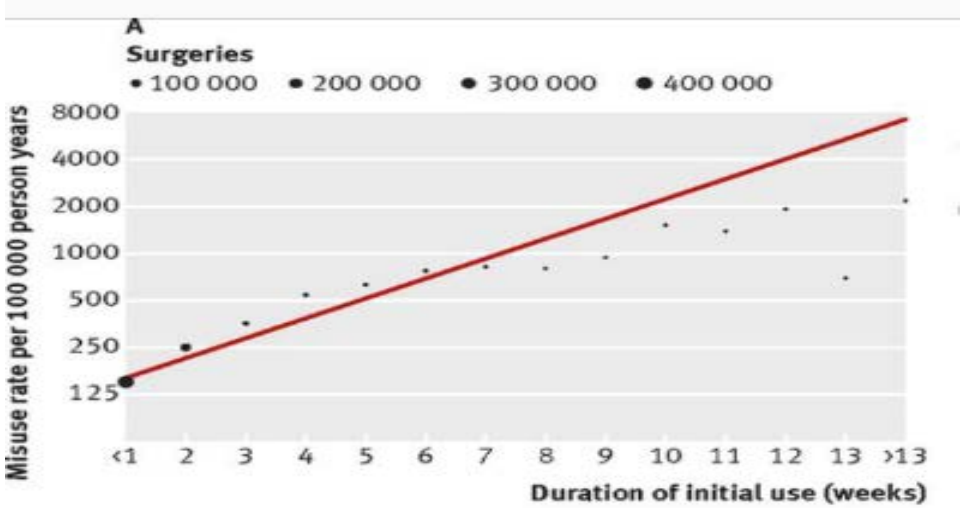
- Opioid use disorder (OUD)
- Ongoing opioid use without OUD
- Opioid overdose with or without OUD

After a surgery, what most predicts becoming addicted to the post operative opioids?

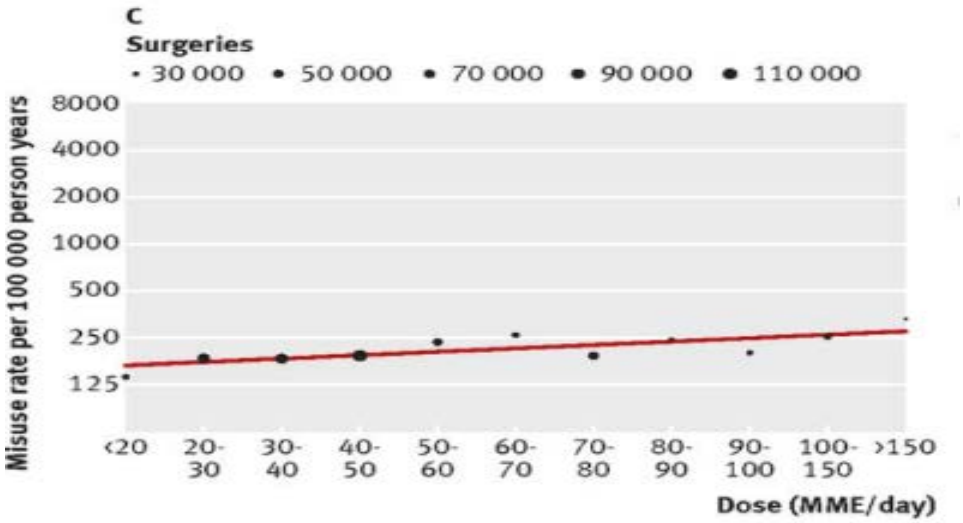
- 1. The type of opioid prescribed
- 2. The daily dose of opioid prescribed
- 3. The duration of opioid prescribed

- Risk of post-op opioid use disorder 0.2%
- Risk factors:
  - Tobacco use disorder RR=2
  - Depression RR=1.6
  - Dose of opioids: for every 10 MME/day
    - 0.8% increased risk
  - Duration of opioids: for each additional 7days
    - 20% increased risk

Duration



Dose



Risk of opioid use disorder post-operatively

1.4% continue opioids one year after surgery (W/OUD)
Many risk factors predict and prevent chronic opioid use

JAMA Intern Med. 2016 Sep 1;176(9):1286-93. doi: 10.1001/jamainternmed.2016.3298.

Incidence of and Risk Factors for Chronic Opioid Use Among Opioid-Naive Patients in the Postoperative Period.

Table 2. Risk Factors for Chronic Opioid Use Following Surgery[a]

Risk Factor	Odds Ratio (SE)[a]	*P* Value
Demographics		
Male	1.34 (0.0648)	<.001
Age >50 y	1.74 (0.0942)	<.001
Preoperative drug use		
Benzodiazepines	1.82 (0.1049)	<.001
Antidepressants	1.65 (0.0928)	<.001
Antipsychotics	1.14 (0.1330)	.28
Medical comorbidities		
Depression	1.15 (0.0717)	.03
Psychosis	1.03 (0.2094)	.89
Alcohol abuse	1.83 (0.2834)	<.001
Drug abuse	3.15 (0.5385)	<.001

What is the biggest risk factor predicting opioid overdose?

- 1. Alcohol use disorder diagnosis
- 2. Schizophrenia diagnosis
- 3. Exposure to fentanyl
- 4. Benzodiazepine co-prescribing

Table 1. Risk Index for Overdose or Serious Opioid-Induced Respiratory Depression (RIOSORD).*

Question	Points for Positive Response
In the past 6 mo, has the patient had a health care visit (outpatient, inpatient, or emergency department) involving any of the following health conditions?†	
Substance use disorder (abuse or dependence), including alcohol, amphetamines, antidepressants, cannabis, cocaine, hallucinogens, opioids, and sedatives	25
Bipolar disorder or schizophrenia	10
Stroke or other cerebrovascular disease	9
Kidney disease with clinically significant renal impairment	8
Heart failure	7
Nonmalignant pancreatic disease (e.g., acute or chronic pancreatitis)	7
Chronic pulmonary disease (e.g., emphysema, chronic bronchitis, asthma, pneumoconiosis, asbestosis)	5
Recurrent headache (e.g., migraine)	5
Does the patient use any of the following substances?	
Fentanyl	13
Morphine	11
Methadone	10
Hydromorphone	7
Does the patient use an extended-release or long-acting formulation of any prescription opioid?‡	5
Prescription benzodiazepine (e.g., diazepam, alprazolam)	9
Prescription antidepressant (e.g., fluoxetine, citalopram, venlafaxine, amitriptyline)	8
Is the patient's current maximum prescribed daily morphine-equivalent dose ≥100 mg for all opioids used on a regular basis?	7
Total possible score	**146**

RIOSORD Opioid overdose prediction tool

Zedler et al jan 2018 Pain Med p68

Table 2. Risk Classes and Predicted Probability of Serious Opioid-Induced Respiratory Depression during the Next 6 Months.*

Risk Class	RIOSORD Score	Average Predicted Probability	Actual Observed Incidence
		percent	
1	<5	1.9	2.1
2	5–7	4.8	5.4
3	8–9	6.8	6.3
4	10–17	15.1	14.2
5	18–25	29.8	32.2
6	26–41	55.1	58.8
7	≥42	83.4	82.4

* Data are from the study by Zedler et al.[17] The study resulted in a model for scoring of the risk of opioid-induced respiratory depression with a C-statistic of 0.90.

Psychiatric Comorbidities

Elimination of opioids

- If you have any reason to believe that the patient may have impaired renal function, measure a creatinine prior to the procedure
- Most opioids are renally cleared

Which medication is not contraindicated by renal failure and does not require dose adjustment in renal failure?

- 1. Oxycodone
- 2. Fentanyl
- 3. Codeine
- 4. Tramadol

Respiratory Risk of Opioids

- Decreased respirations (in a vulnerable patient)
- Pneumonia (aspiration, immunocompromise)
- COPD (lack of awareness of dyspnea)
- Sleep apnea (obstructive and central)

Starting opioids in a patient with COPD does what to her/his risk of breathing problems?

- 1. Increases the rate of exacerbations and death
- 2. Increases the rate of exacerbations but not death
- 3. Lowers the rate of exacerbations and raises the rate of death
- 4. Lowers the rate of exacerbations and no change on risk of death

New opioid rx doubles the mortality in older adults with copd

Association between new opioid use and adverse respiratory outcomes in older adults with COPD*

Outcomes	Event rates		HR (95% CI) at 30 d†
	New opioid use	No opioid use	
Outpatient respiratory exacerbation	3.6%	4.0%	0.88 (0.83 to 0.94)
Emergency department visit for COPD or pneumonia	1.1%	1.0%	1.14 (1.00 to 1.29)
Hospitalization for COPD or pneumonia	1.5%	1.3%	1.08 (0.97 to 1.21)
Hospitalization for COPD or pneumonia with admission to intensive care unit	0.211%	0.212%	0.99 (0.74 to 1.33)
COPD- or pneumonia-related mortality	0.3%	0.1%	2.16 (1.61 to 2.88)
All-cause mortality	1.9%	1.1%	1.76 (1.57 to 1.98)

*COPD = chronic obstructive pulmonary disease; HR = hazard ratio; CI defined in Glossary. Analysis based on propensity-score weighted samples, with scores based on 33 variables representing demographic characteristics, COPD severity, comorbid conditions, types of medication used, types of health care used, and inclusion during influenza season. †30 days after first prescription for an opioid drug (new opioid use group) or new nonopioid drug (no opioid use group).

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Which opioids are most immuno-compromising?

- Different opioids may have different levels of immunosuppressive activity
- Long acting is worse
- Morphine, methadone and fentanyl may be worse

- Wiese clinical infectious disease 15 September 2018

Adverse effects, expected

- Urinary retention
- Constipation
- Pruritis
- Sedation
- Miosis

Which is **not** true of Tramadol?

- 1. Tramadol has a blackbox warning for kids and breastfeeding moms
- 2. Tramadol has a higher risk of causing delirium
- 3. Tramadol has a higher risk of leading to chronic opioid use
- 4. Tramadol has a higher risk of causing a serious fall
- 5. Tramadol has a higher risk of causing a seizure

“Trouble Meds”:
rarely or never start postoperatively

- Benzos and opioids together
  - Associated with increased mortality
- Long-acting opioids
  - Associated with increased mortality
- Methadone
  - QT prolongation, mortality
- Codeine
  - Renal insufficiency, mortality, falls and fractures
  - Black box warning pediatrics, breast feeding, post-op Tonsil/Adenoid
- Tramadol
  - Renal insufficiency, seizures, high rates of forming chronic use
  - Black box warning pediatrics, breast feeding
- Meperidine
  - Renal insufficiency, serotonin syndrome, seizures, mortality

Early Mobility and Falls

- The first 14 days from initiating opioids, risk of fall 4.5X
- Short acting is worse than long acting
- Codeine is the worst; tramadol is the best
- A balance between pain control and fall risk is necessary
- Physical therapy is your friend!

Postoperative Delirium and Opioids

- Post-op delirium is common: 15-35%
- Undertreating pain predisposes to delirium
- Opioids themselves predispose to delirium
- Meperidine and tramadol worse than typical opioids
- Polypharmacy and medical causes important cofactors

Perioperative opioid risks, summary

- *It is not all about addiction and overdose*
- Important outcomes require thoughtful opioid titration
- Unique concerns specific to certain opioids
- Much yet to learn