

OnMedicalGrounds

OMG...I DIDN'T KNOW THAT!

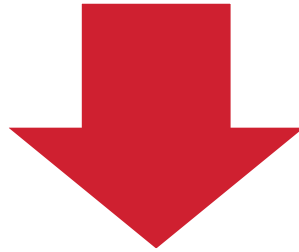


An Orthopedic Surgeon,
A Bike Wreck, and Stopping
the Cycle of Opioid Use

PODCAST 1

CLINICIAN DILEMMA

Opioid-related overdose deaths from prescribed opioids¹



Opioids are safe and inexpensive when used appropriately¹

Surgical and traumatic pain are a common reason for initial opioid prescriptions in opioid naïve patients.²⁻³

1. Rose ME. *Pain Med.* 2018;19(4):793-807.
2. Shah A, et al. *J Pain.* 2017;18(11):1374.
3. Brat GA, et al. *BMJ.* 2018;360:j5790.

OPIOID FACTS

- Oxycodone and morphine sulfate have no anti-inflammatory benefit¹
- Opioids, regardless of route of administration, have no local analgesic effect, acting solely within the CNS²
- No antipyretic effect²
- No benefit against the injury or disease pathology²
- Historically have been a mainstay of initial treatment in trauma, surgery, and accident-induced pain³⁻⁴

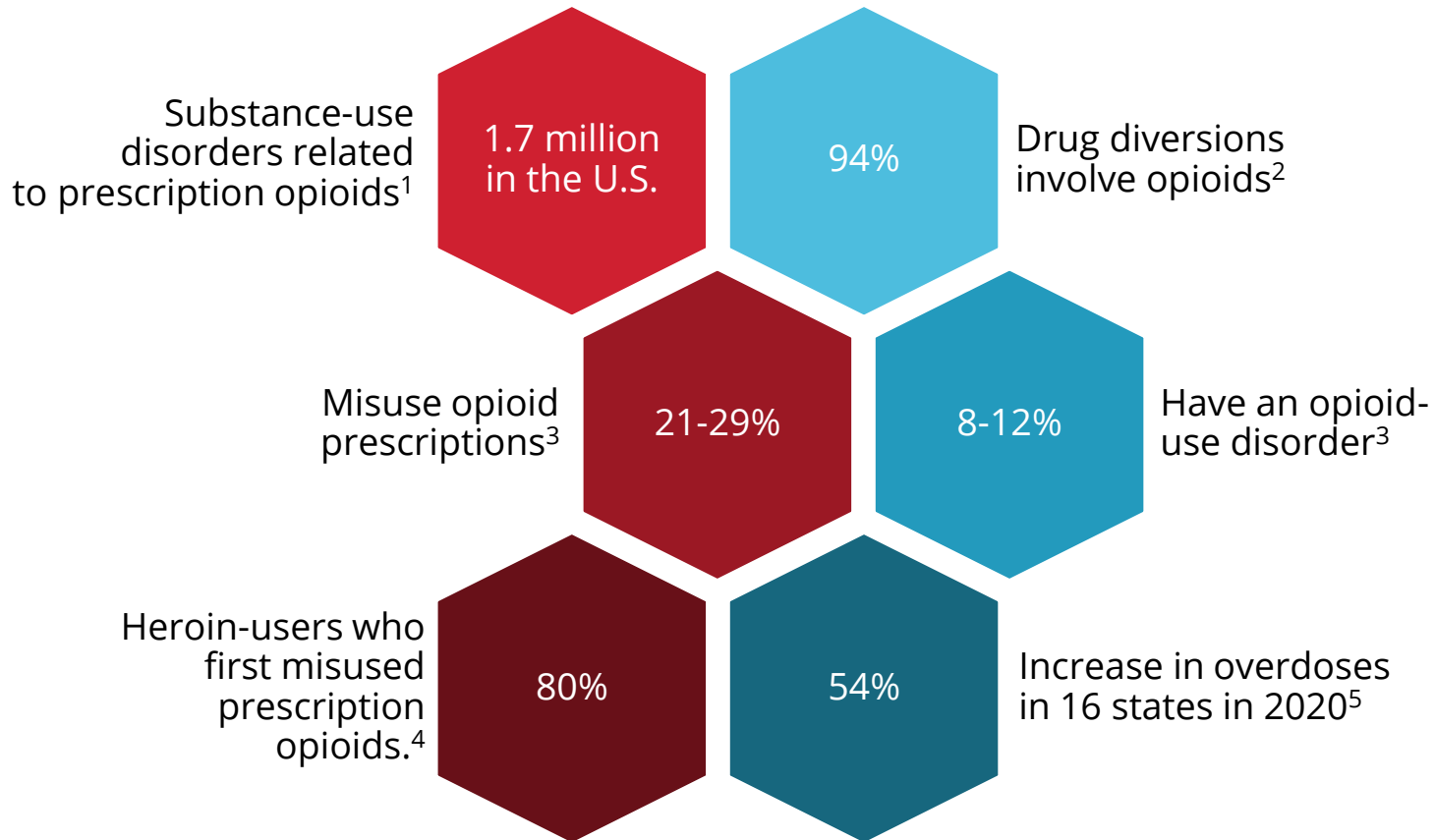
1. Fitzgerald J, et al. *J Can Dent Assoc.* 2015;81:f10.

2. Trivedi M, et al. *AnaesthesiaUK.* <https://www.frca.co.uk/article.aspx?articleid=100933>. Accessed 25 May 2021.

3. Shah A, et al. *J Pain.* 2017;18(11):1374.

4. Brat GA, et al. *BMJ.* 2018;360:j5790.

ABUSE AND DIVERSION



1. <https://www.drugabuse.gov/drugs-abuse/opioids/opioid-overdose-crisis#five>. Accessed 2 June 2021.

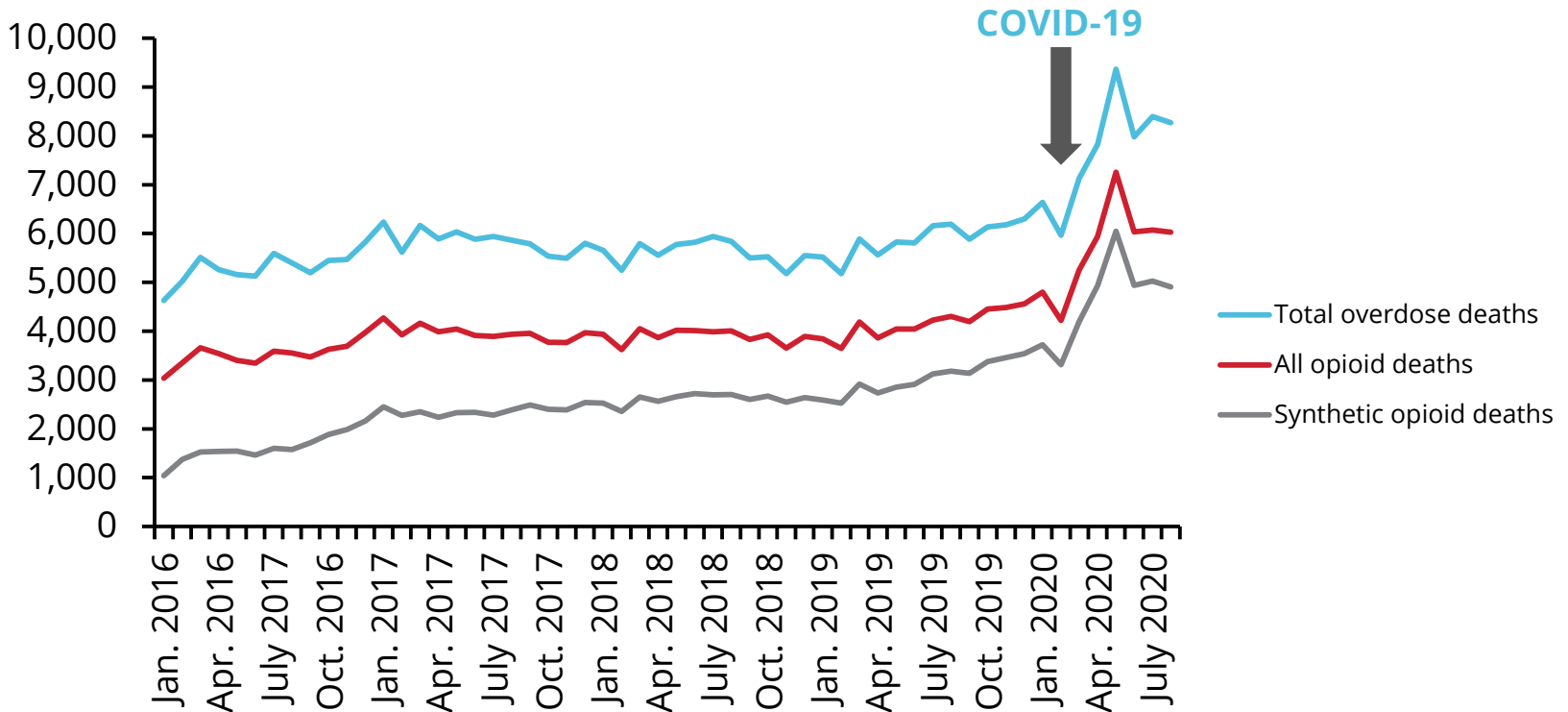
2. Protenus. 2019 Drug Diversion Digest. <https://www.protenus.com/resources/2019-drug-diversion-digest/>. Accessed 2 June 2021.

3. Vowles KE, et al. *Pain*. 2015;156(4):569-76.

4. Muhuri PK, et al. CBHSQ Data Rev. August 2013. Accessed 2 June 2021.

5. Vivolo-Kantor AM, et al. Centers for Disease Control and Prevention. 2017.

OVERDOSE DEATHS SPIKED AFTER START OF THE PANDEMIC, DRIVEN BY SYNTHETIC OPIOIDS



PHYSICIAN RESPONSIBILITIES

Assess monotherapy with opioids for patient

Utilize multimodal pain treatment options

Consider evidence-based analgesia techniques

Tailor pain management to the patient

INTRAVENOUS IBUPROFEN (IVIB)

- In 2009, FDA-approved labeling for intravenous use in pain and fever¹
- No limits on duration of use¹
- Despite earlier confusion there is no evidence or data supporting any prohibition of ibuprofen (or any NSAID) with COVID infection²

1. Caldolor (Ibuprofen) Injection [Package Insert]. Nashville, TN: Cumberland, Pharmaceuticals Inc.; 2021.

2. [https://www.who.int/news-room/commentaries/detail/the-use-of-non-steroidal-anti-inflammatory-drugs-\(nsaids\)-in-patients-with-covid-19](https://www.who.int/news-room/commentaries/detail/the-use-of-non-steroidal-anti-inflammatory-drugs-(nsaids)-in-patients-with-covid-19). Accessed 2 June 2021.

INTRAVENOUS IBUPROFEN (IVIB) ADVERSE EVENTS AND INCIDENCE OF HEMORRHAGE

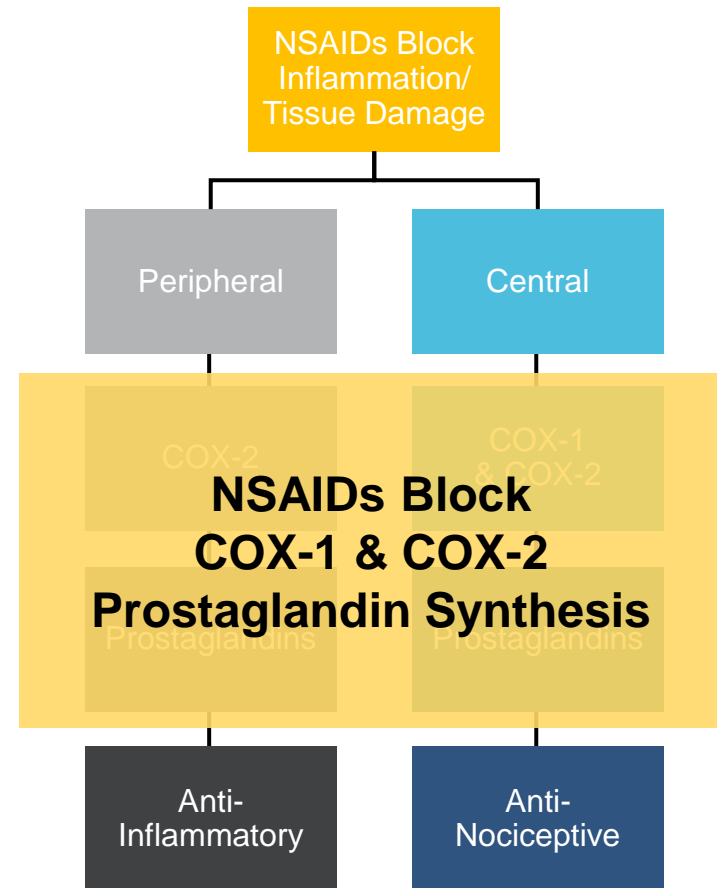
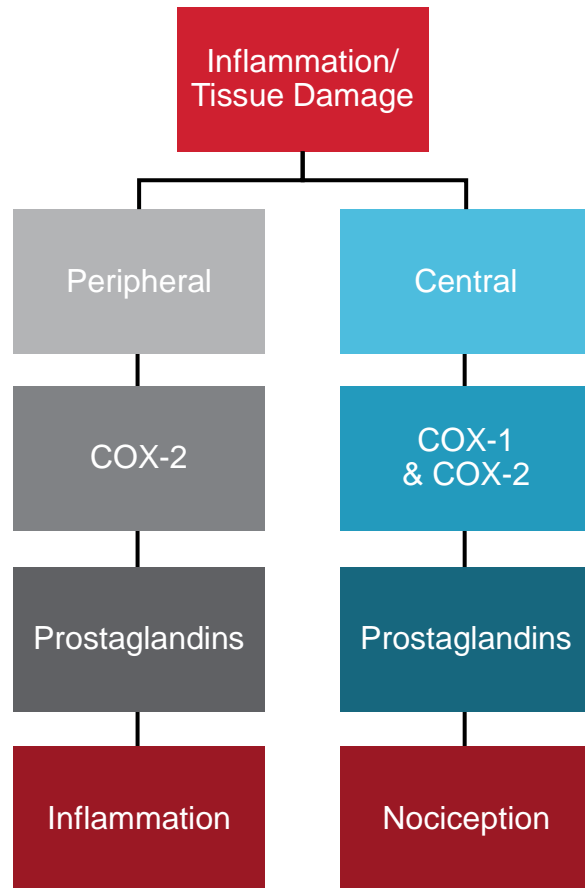
Most Common Adverse Events ($\geq 5\%$)

	IVIB (N = 1,149)	Placebo (N = 452)
	N (%)	N (%)
Any adverse event	691 (60)	384 (85)
Nausea	299 (26)	213 (47)
Vomiting	109 (9)	64 (14)
Constipation	85 (7)	62 (14)
Flatulence	77 (7)	44 (10)
Pruritus	72 (6)	65 (14)
Infusion site pain	62 (5)	1 (1)
Headache	59 (5)	37 (8)
Pyrexia	41 (4)	47 (10)
Anemia	50 (4)	23 (5)

Incidence of Hemorrhage

	IVIB (N = 1,149)		Placebo (N = 452)	
	N	%	N	%
Any hemorrhage	38	3	26	6
Vaginal	26	2	16	4
Wound	8	1	4	1
Urethral	1	1	1	1
Incision site	1	1	1	1
Rectal	1	1	0	0
Ear	1	1	0	0
Postprocedural	0	0	2	1
Peritoneal	0	0	1	1
Conjunctival	0	0	1	1

IVIB MECHANISM IS SIMILAR TO OTHER NSAIDS



INTRAVENOUS IBUPROFEN (IVIB) REDUCES FENTANYL USAGE IN PEDIATRIC* TONSILLECTOMY

	Placebo	IVIB	P-Value
Number of rescue fentanyl doses (median)	2	1	0.037
Fentanyl amount ($\mu\text{g}/\text{kg}$)	1	0.5	0.021
Number of patients receiving more than 1 dose of fentanyl	62%	42%	0.28

*Patients included in this study were ages 6 months through 18 years.

IVIB REDUCES MORPHINE SULFATE USAGE ACROSS MULTIPLE PROCEDURE TYPES

Study	Procedure	Morphine (mg)		P-Value
		Placebo	IVIB	
Singla N, et al. ¹	Elective orthopedic surgery	58	38	< 0.001
Kroll PB, et al. ²	Abdominal hysterectomy	54	43.5	< 0.001
Bayouth L, et al. ³	Rib fracture	32	19	< 0.0001

1. Singla N, et al. *Pain Med.* 2010;11(8):1284-93.
2. Kroll PB, et al. *Pain Pract.* 2011;11(1):23-32.
3. Bayouth L, et al. *Am Surg J.* 2013;79(11):1207-12.

NSAID EFFECTS ON BONE HEALING AND METABOLISM

Study Type	Conclusion	Observations/Limitations
Animal fracture models with high weight/dose NSAIDS	Inhibition of bone healing	Used only high weight/dose
Human retrospective studies with long-term NSAID use	Inferred nonunion or fracture failure	Involved long-term NSAIDs Retrospective studies cannot infer causation
Human prospective study	No evidence of long-term compromise for bone ingrowth of porous coated arthroplasty implants nor in fracture healing	3200 mg ibuprofen over 24 hours in divided doses pre-operatively and for no more than 2-3 days post-operatively

INCREASE NON-OPIOID METHODOLOGIES

- Enhanced Recovery After Surgery¹
 - Outcome-driven
 - Evidence-based
 - Peri-operative care includes multi-modal pain control, pre-emption of nausea, and fluid management
- Non-operative pain reduction techniques²
 - Non-opioid, anti-inflammatory strategies
- Discuss adverse effects of opioids and non-steroidal anti-inflammatory drugs (NSAIDs)²

1. Enhanced Recovery After Surgery Society Guidelines: <http://erassociety.org/2015>. Accessed 2 June 2021.

2. Radcliff K, et al. *Spine*. 2013;38(14):E849-60.



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