

# PHARMACOLOGY POTPOURRI

CRNA Conferences  
October 15, 2023  
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# About Me

**1996** - Temple University - Mechanical Engineering

**2008** - Drexel University - Nursing

**2013** - St. Joseph's University / Nazareth Hospital - Anesthesia

**2014 - 2016** Hahnemann University Hospital - Philadelphia, PA

**2015 - 2022** St. Luke's Health Network - Allentown, PA

**2022 - Current** Nazareth Hospital - Philadelphia, PA

# Conflicts

None\*

# **PHARMACOLOGY POTPOURRI**

**\$200**

This synthetic opioid is  
used frequently by  
anesthesia providers  
and is often in the news.



What is fentanyl?

## Drugs in the News - Fentanyl

**'My heart is beating crazy': Video appears to show Florida deputy exposed to fentanyl during**

**Tampa officer collapses following fentanyl exposure. Traffic stop**

Two Milwaukee County deputies treated for fentanyl exposure

August 11, 2023 | Upd

Each say they were affected by the opiate before Narcan treatment

Share



Updated: 9:31 PM CDT Aug 28, 2023

**Mesquite officer given 2 doses of Narcan after fentanyl exposure during arrest**

By FOX 13 News Staff | Published September 22, 2023 | Tampa | FOX 13 News |

## Our Fentanyl

Vial is 2ml and contains 100 mcg

50 mcg / ml

## Their Fentanyl

2 mg of fentanyl is a lethal dose

2 ml of fentanyl powder contains 2.2 g of fentanyl (1,100 lethal doses)

1,100,000 mcg / ml





Lethal Dose (<https://www.dea.gov/resources/facts-about-fentanyl>)



Lethal Dose (<https://www.dea.gov/resources/facts-about-fentanyl>)





Lethal Dose (<https://www.dea.gov/resources/facts-about-fentanyl>)



Rainbow Reaper from AL.com 9/14/22

# Fentanyl Exposure Fact Check

"This has never happened," said Dr. Ryan Marino, a toxicologist and emergency room physician who studies addiction at Case Western Reserve University. "There has never been an overdose through skin contact or accidentally inhaling fentanyl."

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The Centers for Disease Control and Prevention sent a statement to NPR saying the agency does believe some officers nationwide have experienced medical symptoms after encountering fentanyl. None of those cases involved actual overdoses and none appeared life-threatening.

"The health effects...were such that responders needed medical attention and could not continue performing their duties," said Dr. L Casey Chosewood with the CDC's National Institute for Occupational Safety and Health.

# Fentanyl Recap

Fentanyl is a major health issue and overdoses are common.

Environmental exposure to small amounts of fentanyl is safe and uncommon.

“If fentanyl on your skin isn’t a problem, how does a fentanyl patch work?”

**\$400**

This hypnotic medication is notoriously difficult to produce and expires quickly after being removed from its packaging.





What is propofol?

# Propofol Replacement

## The Contenders

- Fospropofol (Lusedra)
- Remimazolam (Byfavo)
- Ciprofol

# Why replace propofol?

Global propofol sales approaching \$1B/yr

\$3 / 20ml

## Why choose a replacement?

Pain on injection

Hypotension

Therapeutic Index

# Fospropofol

Water soluble prodrug of propofol

Approved 2008

Fospropofol (Lusedra®) May Be An Alternative to Propofol for Monitored Anesthesia Care

APSF - Summer 2010

Less pain on injection

Similar hypotension

Onset : 8 - 12 minutes

\$18 per dose

# Remimazolam

Formulation of midazolam broken down in the blood.

Approved for sedation 2020

\$45 per vial

# Ciprofol

Investigational drug in China and Australia

4-6x stronger than propofol

Early data suggests less pain on injection and less respiratory depression

# Propofol Recap

Not going anywhere

**\$600**



This medication is a novel and expensive preparation of a commonly used local anesthetic.



What is Exparel?

# Exparel - Does It Work?

yes

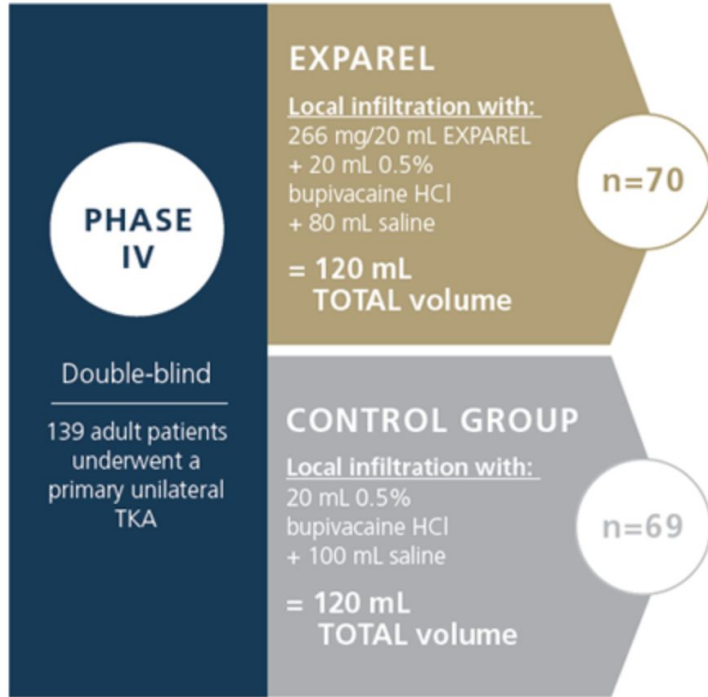
## Does Exparel work better than bupivacaine?

# Exparel versus Bupivacaine

\$13 for 30ml of 0.5% bupivacaine (150mg)

\$365 for 20 ml of Exparel (266mg)

# What's wrong with this picture?



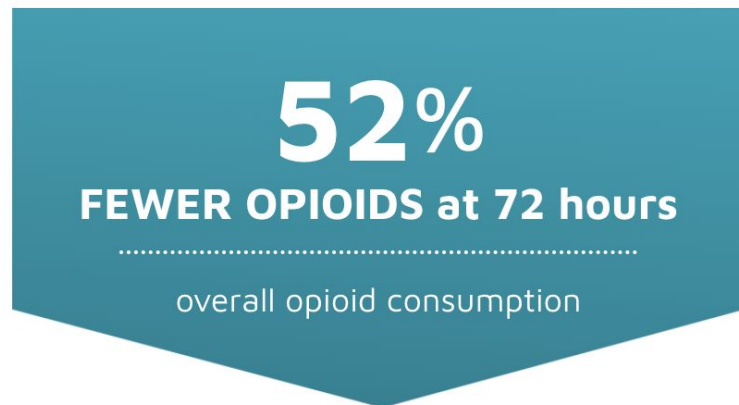
**366 mg in 120 ml**

**0.3% bupivacaine**

**100 mg in 120 ml**

**0.08% bupivacaine**

## EXPAREL TAP block vs bupivacaine TAP block in C-section study



$P=0.0117^{\dagger}$

266mg LB + 50mg bupivacaine in 60ml (0.5% bupivacaine)

50mg bupivacaine in 60ml (0.08% bupivacaine)

# Exparel Recap

Exparel works

Exparel is expensive

**\$800**



This classification of medications was discovered by South and Central American indigenous peoples and was used for hunting.



Non-depolarizing paralytics

# Reversal of Neuromuscular Blockade

Qualitative vs Quantitative vs Clinical Assessment

Adductor Pollicis vs Facial Muscles

Sugammadex vs Neostigmine

# ASA Guidelines (January 2023)

- Quantitative assessment and TOF ratio  $>0.9$  prior to extubation
- Recommend using adductor pollicis muscle
- Recommend not using eye muscles
- Sugammadex is recommended from deep, moderate, and shallow levels of neuromuscular blockade
- Neostigmine is acceptable for minimal blockade (TOF 0.4 or greater)

**\$1000**

*Video*  
DAILY  
DOUBLE



This popular song from the 1970s has been converted into a jingle for what medication?

[Clip](#)

# Glucagon-Like Peptide (GLP-1) Receptor Agonists

Trulicity

Byetta

Ozempic

Trigger GLP-1 receptors, delay stomach emptying, promote satiety, and increase insulin production.



# APSF Newsletter - October 2023

Mayo Clinic - 2 cases

Retained stomach contents

NPO >2 days

## Side Effects of GLP-1 Agonists

Ileus

Pancreatitis

Gastroparesis & Aspiration

# GLP-1 Receptor Agonists - Recommendations

## Preop

- Hold one dose prior to surgery. (Weekly or Daily)
- Consult endocrinology for longer holds.

## Periop

- If GLP-1 Agonist held and no GI symptoms, proceed.
- If not held and no symptoms, consider case to be “Full Stomach”
- Delay surgery if GI symptoms present.

Obligatory Family Photos

# References (1 / 2)

## Fentanyl

<https://www.dea.gov/resources/facts-about-fentanyl>

Accessed 10/8/23

## Exposure 1 - August 11, 2023

<https://www.fox35orlando.com/news/my-heart-is-beating-crazy-florida-deputy-exposed-to-fentanyl-during-traffic-stop>

Accessed 10/9/23

## Exposure 2 - September 22, 2023

<https://www.fox5vegas.com/2023/09/22/mesquite-officer-given-narcan-after-exposed-fentanyl-during-arrest/>

Accessed 10/9/23

## Exposure 3 - September 22, 2023

<https://www.fox13news.com/news/tampa-officer-collapses-following-fentanyl-exposure-tpd>

Accessed 10/9/23

## Exposure 4 - August 28, 2023

<https://www.wisn.com/article/two-milwaukee-county-deputies-treated-for-fentanyl-exposure/44930198>

Accessed 10/9/2023

## Fentanyl reality check

<https://www.npr.org/2023/05/16/1175726650/fentanyl-police-overdose-misinformation>

Accessed 10/10/23

## Oral phenylephrine

<https://www.nytimes.com/2023/09/12/health/cold-medicine-decongestant-fda.html>

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## FDA statement on oral phenylephrine

<https://www.medscape.com/viewarticle/996369>

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## Propofol cost

<https://www.drugs.com/price-guide/propofol>

Accessed 10/8/23

## Propofol sales

[https://www.ftc.gov/sites/default/files/documents/cases/2002/12/baxter\\_wyethanalysis.htm](https://www.ftc.gov/sites/default/files/documents/cases/2002/12/baxter_wyethanalysis.htm)

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Ciprofol

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Propofol pain on injection

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Mixing lidocaine with propofol

<https://associationofanaesthetists-publications.onlinelibrary.wiley.com/doi/abs/10.1111/j.1365-2044.1988.tb06641.x>

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Remimazolam

<https://bmcanesthesiol.biomedcentral.com/articles/10.1186/s12871-022-01641-5>

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Fospropofol

<https://www.apsf.org/article/fospropofol-lusedra-may-be-an-alternative-to-propofol-for-monitored-anesthesia-care/>

Accessed 10/6/23

Remimazolam Costs

[https://www.drugs.com/price-guide/byfavo#:~:text=Byfavo%20\(remimazolam\)%20is%20a%20member.on%20the%20pharmacy%20you%20visit.](https://www.drugs.com/price-guide/byfavo#:~:text=Byfavo%20(remimazolam)%20is%20a%20member.on%20the%20pharmacy%20you%20visit.)

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Remimazolam

<https://www.anesth-pain-med.org/upload/pdf/apm-21115.pdf>

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Ozempic, et al

<https://www.apsf.org/article/are-serious-anesthesia-risks-of-semaglutide-and-other-glp-1-agonists-under-recognized/>

Accessed 10/9/23

Ozempic FDA Ileus warning

<https://www.drugs.com/news/risk-ileus-added-ozempic-label-115229.html>

Accessed 10/9/23

Ozempic ASA guidelines

<https://www.asahq.org/about-as/newsroom/news-releases/2023/06/american-society-of-anesthesiologists-consensus-based-guidance-on-preoperative>

10/9/23

# Drugs in the News - Phenylephrine

“America's most popular oral nasal decongestant, phenylephrine, was deemed ineffective by a Food and Drug Administration (FDA) panel in a unanimous vote on September 12.”

## **HEALTH** Stuffy nose? Common OTC nasal decongestants with phenylephrine don't work in tablet form, experts say

Popular remedies may be ineffective in relieving cold and allergy symptoms

By Shiv St

Published Sept

## Popular nasal decongestant doesn't relieve congestion, FDA advisers say

September 13, 2023 · 5:12 AM ET

# Does Sudafed (et al) still work?

Not since April 8, 2006

Locked up and/or behind the counter

ID required

Phenylephrine



About Me : I am a champion splash-diver.