

Reducing Opioids in our Practices

From ibuprofen to liposomal bupivacaine
Stuart Lieblich, DMD

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Disclosure

- Past consultant/speaker's bureau for Pacira Bioscience
- Manufacturer of EXPAREL

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Issues Associated with Pain Control

- ▶ Expected side effect of surgery
- ▶ Delay in resuming normal activities
- ▶ Side effects of medications
- ▶ Issues of opioid abuse



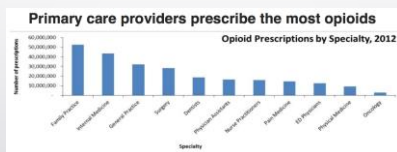
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Definitions and Meaning of Pain

- ▶ Pain is an emotional and physiological sensation of discomfort, distress or agony, resulting from the stimulation of specialized nerve endings.
John J. Bonica, MD, DSc, DMed
- ▶ Pain is whatever the experiencing person says it is, existing whenever he says it does.
Margo McCaffery, MS, RN, FAAN.

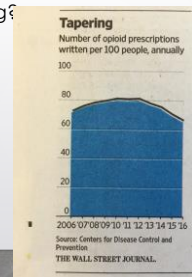
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Opioid Prescriptions by Dentists



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How are we doing?



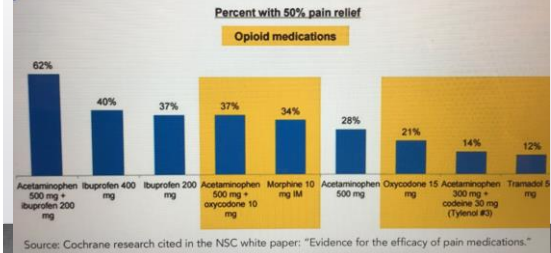
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Times Square Billboard



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Opioids are not the most effective at providing pain relief.



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Oral Narcotic Analgesics

- ▶ Indicated for short-term postoperative pain
- ▶ Not indicated as premedication
 - ▶ Unless preoperative pain
- ▶ Potential increase in nausea/vomiting

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Oral Analgesics

- ▶ Post-op call: "My jaw is killing me!"
- ▶ Usual management:
 - ▶ Take additional peripheral acting agents
 - ▶ Percocet only has 325mg of acetaminophen
 - ▶ Try 2 of the Rx meds if not sedated

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Opioid Oral Analgesics

- ▶ Failure to respond issues
 - ▶ Concern with abuse issues
 - ▶ POD #2 already finished 15 Rx meds
- ▶ May be enzyme deficiency (CYP2D6)
 - ▶ 5-8% of Caucasians enzyme deficient
- ▶ Use alternative class
 - ▶ Meperidine
 - ▶ Tramadol
 - ▶ Talwin
 - ▶ Caution with agonist/antagonist

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Oral Analgesics

- ▶ Codeine is a pro-drug
 - ▶ Converted by CYP2D6 to morphine
- ▶ Hydrocodone: active plus conversion to hydromorphone
- ▶ Oxycodone: mostly active
- ▶ Inhibitors of CYP2D6
 - ▶ SSRI
- ▶ Activators
 - ▶ Dexamethasone

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Drug Effects in Children

FDA Expands Warnings on Codeine and Tramadol for Children
The agency says the medicines carry serious risks, including slowed breathing or death

The Food and Drug Administration expanded its safety warnings about the use of codeine and tramadol products for pain or cough relief with children, saying the medicines carry serious risks, including slowed or difficult breathing or even death

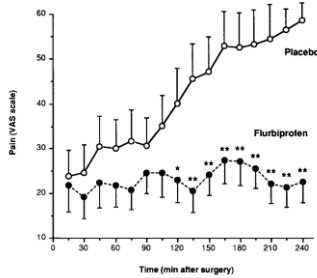
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Pain Relief Strategies: Definition of Terms

- ▶ Preemptive analgesia
 - ▶ Administered before incision
- ▶ Preventive analgesia
 - ▶ Administered before pain starts
- ▶ Repeat administration
 - ▶ Dosing at interval basis vs. pm
- ▶ All three (?) approaches enhance recovery, decrease analgesic use, decrease central sensitization, attenuates expected postoperative pain levels

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Effectiveness of Pre-emptive NSAID's

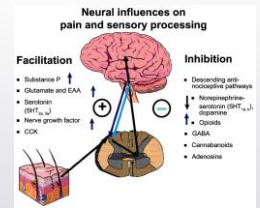


Swift, et al, JOMS 1993

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Does Pre-emptive Analgesia Exist?

- No validated studies in acute pain



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Pre-emptive vs Preventive: NSAIDS

- Postoperative administration had significantly longer time of analgesia (227min vs 158 min)
- Less side effects with postoperative administration



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Preemptive Complications: NSAID's

- ▶ Aspirin
 - ▶ Increased nausea and vomiting
 - ▶ Increased swelling and ecchymosis
- ▶ Diflunisal
 - ▶ Increased dry socket rate
- ▶ Ibuprofen
 - ▶ Increased nausea and vomiting

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Choice of Local Anesthetic

- Lidocaine:
 - pKa 7.9
 - Protein binding 65
- Articaine
 - pKa 7.8
 - Protein binding 95
- Bupivacaine
 - pKa 8.1
 - Protein binding 95

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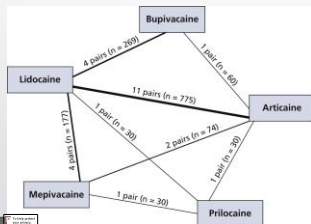
Irreversible pulpitis: Mandibular molar

- IANB: 33%
- IANB + buccal/lingual infiltration lido 2% with epi: 47%
- IANB + buccal/lingual infiltration with Articaine: 67%

Aggarwal et al J Endo 2009

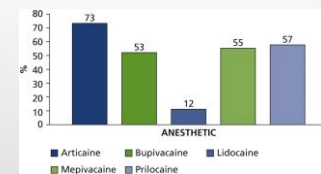
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Why use Articaine?



The Journal of the American Dental Association 2020; 151(9):974-980. Copyright © 2020 American Dental Association.

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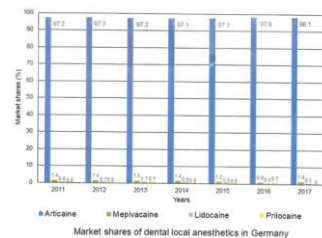
The Journal of the American Dental Association 2020; 151(9):974-980. Copyright © 2020 American Dental Association.

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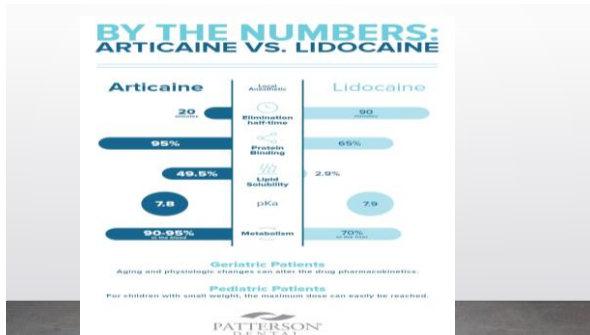
	USA	Ontario - 1993
Mepivacaine	1:623,112,900	1:1,125,000
Lidocaine	1:181,076,673	1:1,125,000
Bupivacaine	1:124,286,050	
OVERALL	1: 13,800,970	1: 785,000
Articaine	1: 4,159,848	(2.27:1,000,000) 1: 440,529
Prilocaine	1: 2,070,678	(1.7:1,000,000) 1: 588,235

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Anesth Prog 68:19-25 2021



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How do we compensate for infection? Choice of Local

- Use a higher concentration local anesthetic
 - 3% mepivacaine
 - 4% articaine
- Use an agent that is more protein bound
 - Bupivacaine
 - Articaine
- Use an agent with a pKa closer to normal pH
 - Articaine 7.8

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Pain on Injection

- ▶ Associated with pH of solution
 - ▶ Epinephrine needs acid environment
- ▶ Speed of injection
- ▶ Volume of injection
- ▶ Type of tissue
- ▶ Dull needle, barbed end
- ▶ Not associated with:
 - ▶ Gauge of needle
 - ▶ Temperature of solution
 - ▶ Number of injections

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Continuous Local Anesthetic Infusion

- ▶ Indicated following iliac grafts
- ▶ Permits earlier ambulation




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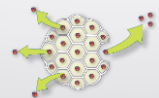
New Delivery Methods

- ▶ Combining liposomal microspheres and local anesthetics for sustained relief
 - ▶ 4 day duration achieved in animal model
- ▶ EXPAREL: now available for use
- ▶ Approved >6 years age



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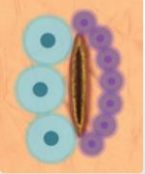
Bupivacaine/liposome (EXPAREL)



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Infiltration With EXPAREL Requires More Injections



Traditional Bupivacaine HCl



EXPAREL

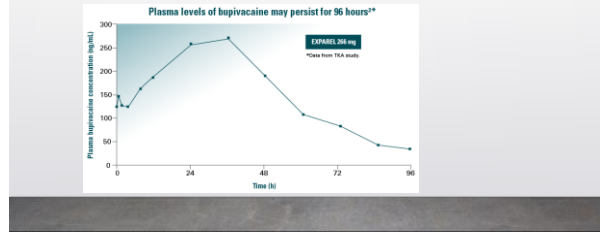
EXPAREL stays more precisely where placed, requiring more injections to effectively cover the surgical area.

EXPAREL does not diffuse through the tissues in the same manner as traditional bupivacaine.


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Plasma Levels of Bupivacaine following EXPAREL Infiltration



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INNOVATE: Injection Protocol



Maxilla

4 mL of EXPAREL:

- On the buccal side
- 2 mL right
- 2 mL left



Mandible

6 mL of EXPAREL:

- 3 mL right
- 3 mL left

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INNOVATE Trial

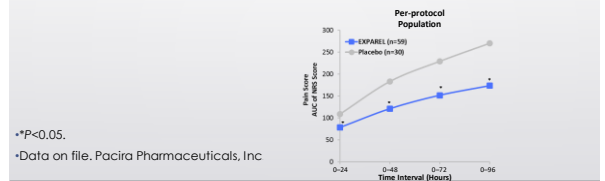
Infiltration Trial in Third Molar Extraction
 Observing the Analgesic Effect of EXPAREL: The INNOVATE Clinical Trial

Lieblich SE, Danesi H; Anesth Prog 2017

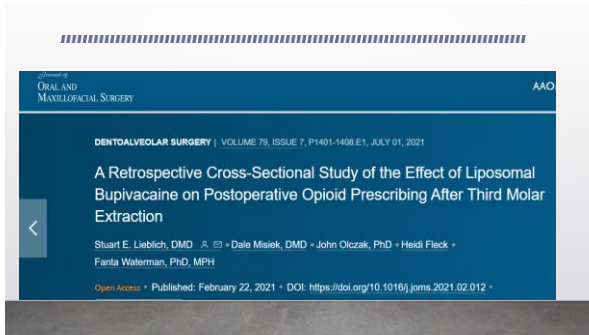
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INNOVATE: Trial Results

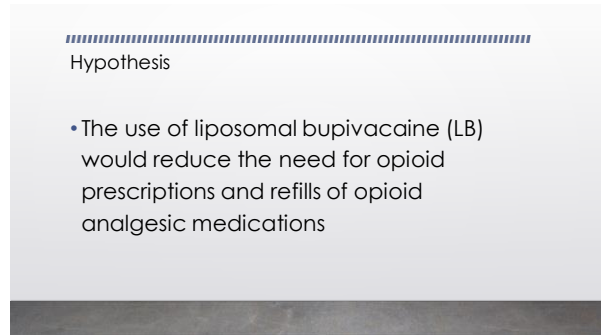
- In the per-protocol analysis, significant reductions in pain intensity scores in the EXPAREL group compared to placebo through 96 hours



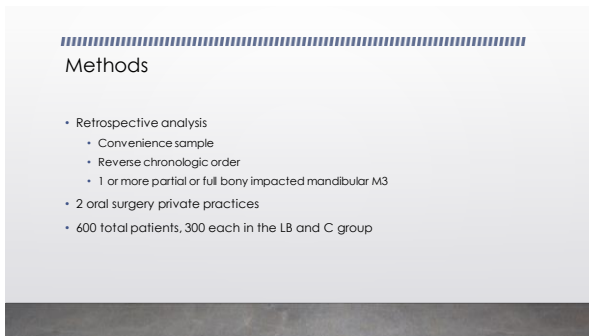
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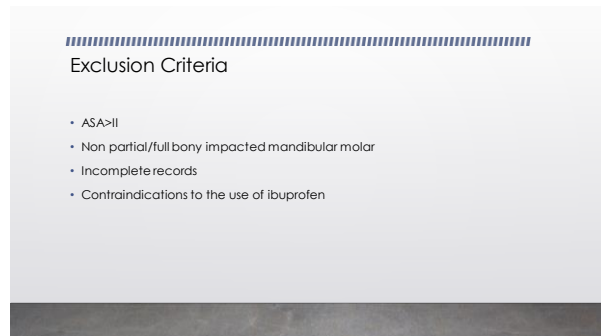
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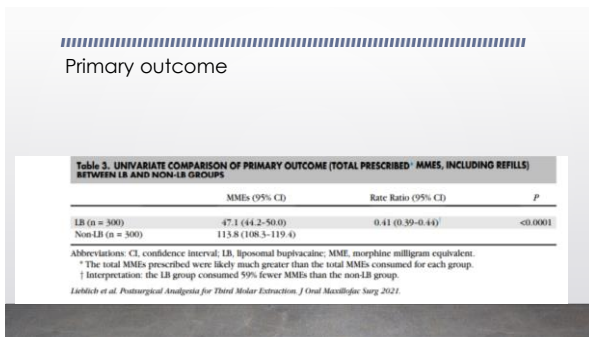
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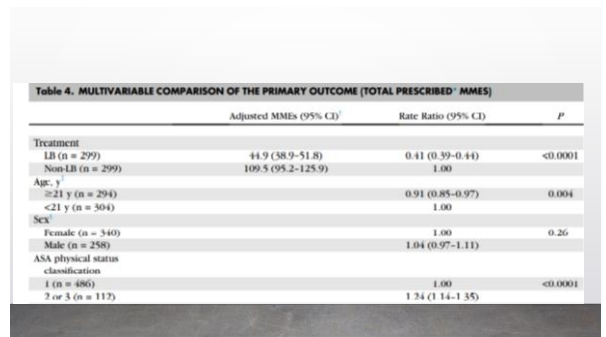
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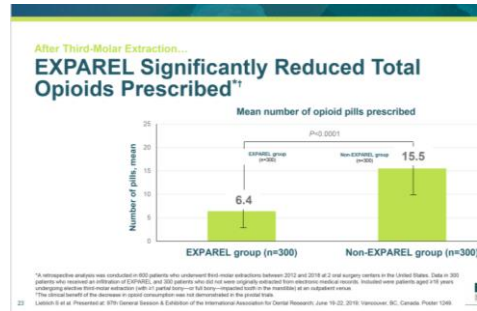
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Complications

- Infections:
LB: 3.6% Control 2.7%
- Alveolar osteitis:
LB 4.7% Control 6%
- Nerve injury (all resolved)
LB 0.3% Control 0.7%

Surgical complications, n (%)	LB (n=300)	Control (n=300)	P
Yes	27 (9.0)	28 (9.3)	0.89
No	273 (91.0)	272 (90.7)	

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Limitations

- Retrospective analysis
- Direct opioid consumption was not determined

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- ### Helpful Reminders
- EXPAREL is not indicated for nerve blocks
 - Utilize a 25-gauge or large-bore needle
 - Bupivacaine can be used with or immediately prior to EXPAREL to provide early analgesia coverage
 - If you locally infiltrate lidocaine, wait 20 minutes before infiltrating EXPAREL or change to local infiltration of bupivacaine HCl
 - EXPAREL does not diffuse throughout tissues in the same manner as bupivacaine HCl; effective liposome distribution requires an adjustment to the infiltration technique
 - Greater volume and more injections can help to ensure full distribution of the liposomes
 - Incorporate EXPAREL in your multimodal approach as part of an opioid-reducing strategy
 - Explain to patients and nursing staff that opioids may not be needed after surgery to reduce unnecessary use
 - Do not expect perfect results the first time

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FDA Indication Supports EXPAREL Use in Oral Surgery

- The broad indication for EXPAREL includes:
 - "...Use for postanalgesia when administered as local infiltration at the site of oral surgical procedures, including tooth extractions."
 - Use as a "...local anesthetic deposited near a terminal branch of the maxillary or mandibular branch of the trigeminal nerve" (periapical injections)
 - Approved 6 years and older (2020)

FDA/US Food and Drug Administration
EXPAREL is not indicated for nerve blocks. Please see full prescribing information available at www.EXPAREL.com
US Food and Drug Administration (FDA), 44 US Code § 354a Supplemental Approval. Search Patent for EXPAREL, 2015. <http://www.fda.gov/oc/medwatch/Drug-Questions-of-Compliance>
Search Patent for EXPAREL, 2015. <http://www.fda.gov/oc/medwatch/Drug-Questions-of-Compliance>. Accessed August 25, 2024.

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PUTTING IT ALL TOGETHER: Preoperative

Patient/Parent Consultation

Discuss pain management openly

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Putting it all Together: Perioperative

- Peri-operative steroid
 - Reduction of edema and decreased nausea
- Intra-operative fluid resuscitation
- Local anesthetics:
 - Lidocaine/articaine for rapid onset
 - Bupivacaine for 4-7 hours of analgesia**
 - Liposomal bupivacaine: 48-72 hours of analgesia

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Putting it all together: Postoperative

- Post-operative analgesics
 - Central (acetaminophen) and peripheral acting agents
 - Scheduled doses of NSAID (600 mg q 6hours x 72 hours)
 - Rescue Rx of an opioid



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What's Next??



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Thanks for your interest!

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Stuart Lieblich, DMD

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