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# The Art of Dental Therapeutics

## Keeping Patients Comfortable when the Local Anesthesia Wears Off – Appropriate Analgesic Prescribing

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**Our Clinician:**

**Dr. Mark Donaldson BSP, RPH, PHARMD, FASHP, FACHE** received his baccalaureate degree from the University of British Columbia and his Doctorate in Clinical Pharmacy from the University of Washington. He completed a residency at Vancouver General Hospital, and has practiced as a clinical pharmacy specialist, clinical coordinator and director of pharmacy services at many healthcare organizations in both Canada and the United States. He is currently the Associate Principal of Clinical Pharmacy Performance Services for Vizient, in Whitefish, Montana.

Dr. Donaldson is a Clinical Professor in the Department of Pharmacy at the University of Montana in Missoula, and Clinical Associate Professor in the School of Dentistry at the Oregon Health & Sciences University in Portland, Oregon. He has a special interest in dental pharmacology and has lectured internationally to both dental and medical practitioners. He has spent the last 25 years focusing on dental pharmacology and dental therapeutics, and is a leader in the field.

Dr. Donaldson has published numerous peer-reviewed works and textbook chapters. He currently serves on the Editorial Board for the Journal Healthcare Executive and the Journal of the American Dental Association, and is a reviewer for over ten other different journals. He is board certified in healthcare management and is the Past-President and current Regent of the American College of Healthcare Executives' Montana Chapter. Dr. Donaldson was named as the 2014 recipient of the Bowl of Hygeia for the state of Montana and is the 2016 recipient of the Dr. Thaddeus V. Weclew Award. This award is conferred by the Academy of General Dentistry upon an individual who has made outstanding contributions to the medical, dental and pharmacy literature. In 2019, Dr. Donaldson was conferred by the Canadian Dental Association (CDA) in Ottawa with the, "Special Friend of Canadian Dentistry Award." This award is given to an individual outside of the dental profession in appreciation for exemplary support or service to Canadian dentistry and/or to the profession as a whole.

# Keeping Patients Comfortable when the Local Anesthesia Wears Off - Appropriate Analgesic Prescribing

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## Learning Objectives

- Review best practices to maintain compliance and efficacy in post-oral surgery pain management
- Understand the ideal analgesic recipe to manage (almost) all of your patient's pain – first time, every time
- Describe the prevalence and causes of opioid addiction
- Discuss opioid-alternative solutions and their efficacy

*The number of overdose deaths from painkillers more than tripled over a decade - a trend that a U.S. health official called an epidemic.* **(November 1, 2011, Associated Press)**

*A Whitehouse official declared the opioid epidemic a national public health emergency. "Nobody has seen anything like what is going on now."* **(October 26, 2017, Associated Press)**

*The number of pharmaceutical opioid related deaths exceeds the number of deaths from motor vehicle accidents involving alcohol in BC.*

***Gladstone EJ, Smolina K, Morgan SG. Trends and sex differences in prescription opioid deaths in British Columbia, Canada. Inj Prev 11015.***

## Why is this course important to you?

Dentists follow primary care physicians as the **second-leading prescribers** of immediate-release opioids. As such, dentists have been identified as having **an important role in opioid abuse prevention efforts.**

***Denisco RC, Kenna GA, O'Neil MG, et al. Prevention of prescription opioid abuse: the role of the dentist. JADA. 2011;142(7):800-810; Oakley M, O'Donnell J, Moore PA, et al. The rise in prescription drug abuse: raising awareness in the dental community. Compend Contin Educ Dent Suppl. 2011;32(6):14-16,18-22.***

**State Board Regulatory Example Continuing education requirements for opioid prescribing:** Complete a one-time continuing education requirement regarding best practices in the prescribing of opioids at least three hours in length and completed by the end of the dentist's first full continuing education reporting period, or during the first full continuing education reporting period after initial licensure, whichever is later.

**At a Federal Level:** The Medication Access and Training Expansion (MATE) Act. Deadline is the date of your next scheduled DEA registration submission, on or after June 27, 2023.

## Other Notes or Questions to Ask:

**All Drug Enforcement Agency (DEA) registered prescribers of schedule II, III, IV or V medications** will be required to complete a one-time, eight-hour, non-repetitive educational training on treating and managing patients with opioid and other substance use disorders. **A comprehensive curriculum that included at least eight hours of training on the safe pharmacological management of dental pain**

***1 in 17*** *people started on an opioid will become addicted.*

***Characteristics of Initial Prescription Episodes and Likelihood of Long-Term Opioid Use — United States, 2006–2015 CDC Weekly March 17, 2017 / 66(10);265–269***

*The risk for substance use disorder and bad outcomes associated with substance use is* ***highest in teenagers.*** ***CDC, 2022***

**<u>Common risk factors for teen drug abuse include:</u>**

- A family history of substance abuse.
- A mental or behavioral health condition, such as depression, anxiety, or attention-deficit/hyperactivity disorder (ADHD).
- Impulsive or risk-taking behavior.
- A history of traumatic events, such as experiencing a car accident or being a victim of abuse.
- Low self-esteem or feelings of social rejection.

**<u>Numerous negative consequences of drug abuse in teens and young adults:</u>**

- Drug dependence
- Poor judgment
- Sexual activity
- Mental health disorders
- Impaired driving
- Changes in school performance

***https://www.cdc.gov/healthyyouth/substance-use/index.htm***

**Regulatory Example: Treatment plan— Acute nonoperative pain and acute perioperative pain.**

(1) The dentist shall consider prescribing **nonopioid analgesics as the first line of pain control** in patients unless not clinically appropriate.

| | |
|---|---|
| **Acetaminophen** | Tylenol |
| **Aspirin** | Aspirin (various) |
| **Ibuprofen** | Advil, Motrin, Nuprin |
| **Flurbiprofen** | Ansaid |
| **Diflunisal** | Dolobid |
| **Naproxen** | Naprosyn, Aleve |
| **Ketorolac** | Toradol |
| **Ketoprofen** | Orudis |
| **Etodolac** | Lodine |
| **Codeine** | Codeine (in various) |
| **Oxycodone** | Percocet, Percodan |
| **Meperidine** | Demerol |
| **Pentazocine** | Talwin |
| **Hydrocodone** | Lortab, Vicodin |
| **Dihydrocodeine** | Synalgos-DC |

## Other Notes or Questions to Ask:

## Analgesics used for Postoperative Dental Pain

### Acetaminophen

- Comparable to ASA and NSAIDs in analgesic & antipyretic activity
- Weak anti-inflammatory activity
- Minimal antiplatelet effect
- Minimal injury to gastric mucosa

**Dose:** 325mg to 1000mg TID or QID
**Max. dose** is 4.0 grams daily to ↓ hepatotoxicity. Increased danger of hepatotoxicity with chronic alcohol consumption (max: 2g/day)

**Table 1.** Proposals considered by the FDA Analgesic Advisory Committee for addressing acetaminophen toxicity.

| Proposal | Result |
|---|---|
| Reduce current dosage strengths for OTC products (maximum total daily dose, maximum adult single dose, maximum strength):<br>• Maximum dose per day: less than 4 g, exact amount unspecified<br>• Maximum single dose: 650 mg (2 × 325 mg) | Approved |
| Limit 500-mg tablet, 1000-mg dosing, and/or 4g/d dosing to prescription-only status:<br>• Maximum dose of 500 mg × 2 should be prescription only | Approved |
| Establish package size limits for OTC acetaminophen products | Not approved |
| Eliminate OTC combination products | Not approved |
| Limit formulations of nonprescription liquids to a single concentration (pediatric dosing) | Approved |
| Eliminate prescription combination products (opioid/acetaminophen compounds) | Approved |
| If not eliminated, sell prescription combination products in "unit of use" packaging with additional warning labels | Approved |

Abbreviations: FDA, Food and Drug Administration; OTC, over-the-counter.

2021 marked the 70th year since acetaminophen's approval for use in the United States by the Food and Drug Administration, and it **continues to be the drug of choice for children with fevers and pregnant and lactating women experiencing mild pain.** In combination with a nonsteroidal anti-inflammatory agent, acetaminophen is also an important adjunct **endorsed by the American Dental Association** to manage postoperative dental pain.

**The VERY Latest on Acetaminophen:** data from observational studies evaluating whether acetaminophen exposure in utero is correlated with subsequent neurodevelopmental disorders have been conflicting, but higher-quality studies have been less likely to show an association. **A causal relationship has not been established**. Since no acceptable pharmacologic alternatives are available, **acetaminophen should remain the drug of choice for fever and pain during pregnancy.** As with any drug, it would be prudent to advise pregnant women to take acetaminophen in the lowest effective dose for the shortest possible duration of time.

***Prenatal Acetaminophen Use and Autism. Med Lett Drugs Ther. 2025 Oct 27;67(5123):1-3 doi:10.58347/tml.2025.5123a***

### Non-Steroidal Antiinflammatory Drugs (NSAIDs)

"NSAIDs should be considered as the drugs of choice to alleviate or minimize pain of endodontic origin. In situations in which NSAIDs alone are not effective, the combination of an NSAID with acetaminophen is recommended."

***Aminoshariae A, Kulild JC, Donaldson M, Hersh EV. Evidence-based recommendations for analgesic efficacy to treat pain of endodontic origin: A systematic review of randomized controlled trials. J Am Dent Assoc. 2016;147(10):826-39.***

## Other Notes or Questions to Ask:

NSAIDs are peripheral analgesics that inhibit prostaglandin synthesis. Prostaglandins generated during tissue damage direct some actions of inflammation:

- Fever
- Pain
- Vasodilation

**The Perfect Prescription: "2 - 4 - 24"**

- Ibuprofen 600mg po q6h x24 hours
- Acetaminophen 1g po q6h x24 hours

**Overcoming challenges**

- Compliance! Start in office
- "I have already tried ibuprofen and/or acetaminophen" – sell it
- Should we stagger doses? – not necessary except for clock-watchers
- How can I set my patients up for success?
  - "Dispense" from the office
  - Pill burden (OTC vs Rx) ***(Health Care Logistics https://gohcl.com)***

**Advil® Dual Action**

- Acetaminophen 250mg and Ibuprofen 125mg per caplet
- You cannot achieve the optimal analgesic dose of both acetaminophen and ibuprofen in combination even after splitting the caplets.
- If you attempt match the optimal analgesic dose of ibuprofen 600mg, you will greatly exceed the recommended maximum dose of acetaminophen

**Combogesic® Tablets**

- Acetaminophen 325mg and Ibuprofen 97.5mg per caplet
- You cannot achieve the optimal analgesic dose of both acetaminophen and ibuprofen in combination: "up to 3 tablets every 6 hours."
- If you attempt match the optimal analgesic dose of ibuprofen, 600mg, you will greatly exceed the recommended maximum dose of acetaminophen (8g!)

***2022 CDC Clinical Practice Recommendations***

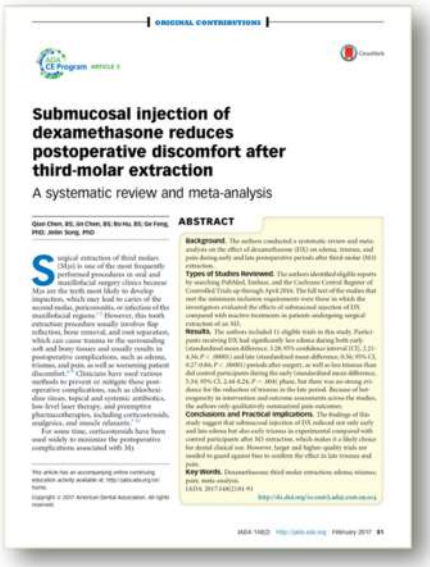
***Evidence-based clinical practice guideline for the pharmacologic management of acute dental pain in children: A report from the American Dental Association Science and Research Institute, the University of Pittsburgh School of Dental Medicine, and the Center for Integrative Global Oral Health at the University of Pennsylvania. J Am Dent Assoc. 2023 Sep;154(9):814-825.e2.***

***Evidence-based clinical practice guideline for the pharmacologic management of acute dental pain in adolescents, adults, and older adults: A report from the American Dental Association Science and Research Institute, the University of Pittsburgh, and the University of Pennsylvania. J Am Dent Assoc. 2024 Feb;155(2):102-117.e9.***

## Other Notes or Questions to Ask:

## Additions to the Perfect Prescription: "2 - 4 - 24":

- **Celecoxib** 400mg 30 minutes pre-op (pre-emptive analgesia)
- **Dexamethasone** 4-8mg pre-/post-operatively b.i.d. x48 hours
- Submucosal injection of dexamethasone – perioperative



ORIGINAL CONTRIBUTIONS

JADA CE Program ARTICLE 1

**Submucosal injection of dexamethasone reduces postoperative discomfort after third-molar extraction**

A systematic review and meta-analysis

Qian Chen, BS, Jin Chen, BS, Bo Hu, BS, Ge Feng, PhD, Jinlin Song, PhD

ABSTRACT

***Chen Q, Chen J, Hu B, Feng G, Song J. Submucosal injection of dexamethasone reduces postoperative discomfort after third-molar extraction: A systematic review and meta-analysis. J Am Dent Assoc. 2017 Feb;148(2):81-91.***

## New Potential Non-Opioid Strategies

- **Exparel®** (liposomal bupivacaine)
- **Journavx®** (suzetrigine)
- **Orasoothe®** (a natural oral hydrogel containing aloe, xylitol, and essential oils of cinnamon, clove, and thyme)

"Non-Opioids Prevent Addiction In the Nation Act" or the "**NOPAIN Act**". This bill temporarily establishes separate payments for certain non-opioid treatments under the Medicare prospective payment system for hospital outpatient department services and the payment system for ambulatory surgical center services. The bill applies to pain management treatments that are able to replace or reduce opioid consumption, as shown through clinical trials or data.

### Exparel® (liposomal bupivacaine)

- Introduced into the US market in 2011 based on data showing improved pain control in bunionectomy and hemorrhoidectomy patients over placebo
- Hospital programs started using it in multiple sites for wound infiltration and certain nerve blocks due to perceived prolonged duration of effect (96 hours)
- FDA labeling as a non-opioid long-acting analgesic

Does liposomal bupivacaine fulfill an unmet need in dentistry? – **No!**

***Goodchild JH, Donaldson M. Does liposomal bupivacaine fulfill an unmet need in dentistry? Gen Dent. 2018 Sep-Oct;66(5):14-16.***

- "Liposomal bupivacaine was found to be not different from plain local anesthetics for postoperative pain and all other analgesic and functional outcomes."
- "The twelve human clinical studies that met the literature search criteria do not support the use of liposomal bupivacaine in oral and maxillofacial surgery.

***Hussain N, et al. Perineural Liposomal Bupivacaine Is Not Superior to Nonliposomal Bupivacaine for Peripheral Nerve Block Analgesia. Anesthesiology. 2021;134(2):147-164.***

## Other Notes or Questions to Ask:

A long-acting local anesthetic, such as bupivacaine, or etidocaine, may delay onset and severity of postoperative pain.

***Feldmann G, Nordenram A. Marcaine in oral surgery. A clinical comparative study with carbocaine. Acta Anaesthesiol Scand Suppl. 1966;23:409–413.***

***Sisk AL. Long-acting local anesthetics in dentistry. Anesth Prog. 1992;39(3):53-60.***

***Decloux D, Ouanounou A. Local anaesthesia in dentistry: a review. Int Dent J. 2020 Sep 17;71(2):87–95.***

***Mathison M, Pepper T. Local Anesthesia Techniques In Dentistry and Oral Surgery. [Updated 2023 Jan 29]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing;***

### Journavx® (suzetrigine)

On January 30, 2025 the FDA approved Vertex's suzetrigine for the treatment of moderate to severe acute pain in adults. Suzetrigine is an orally administered first-inclass selective antagonist of the NaV1.8 voltage-gated sodium channel that propagates pain signals. By inhibiting NaV1.8, found only in the peripheral nervous system, suzetrigine produces analgesia via blocking pain signal transmission to the central nervous system. In contrast to opioids, suzetrigine has not been shown to have the potential for dependency or addiction.

The efficacy of suzetrigine was evaluated in 2 randomized, double-blind, controlled trials in 2 different populations: abdominoplasty and bunionectomy. Both trials demonstrated a statistically significant reduction in summed pain intensity difference scores over 48 hours (SPID48) with suzetrigine versus placebo. It is not known if this is a clinically meaningful pain reduction as the SPID48 minimal clinically important difference has not been established. Differences in pain intensity at 48 hours between suzetrigine and hydrocodone bitartrate/acetaminophen (HBA) were not consistent across trials. Discontinuation was less frequent in the suzetrigine group than in the placebo group. Studies evaluating suzetrigine in the setting of chronic pain, including diabetic neuropathy and lumbosacral radiculopathy, are ongoing. The wholesale acquisition cost (WAC) for a 14-day course of suzetrigine is $450. This meets the Institute for Clinical and Economic Review's (ICER) cost-effectiveness threshold but exceeds the WAC for most opioids prescribed for post-operative pain.

### Bottom Line

- Suzetrigine is an oral voltage-gated sodium 1.8 channel (Nav1.8) inhibitor labeled for the treatment of moderate to severe acute pain in adults.
- By inhibiting NaV1.8, found only in the peripheral nervous system, suzetrigine produces analgesia via blocking pain signal transmission to the central nervous system.
- It is the first Nav1.8 inhibitor to gain FDA approval and the first orally available, novel nonopioid analgesic approved in almost 20 years.

## Other Notes or Questions to Ask:

- In contrast to opioids, suzetrigine has not been shown to have the potential for dependency or addiction (NOPAIN Act compliance).
- Not approved for mild pain or for as needed (PRN) use due to its delayed onset of meaningful pain relief (approximately 2 to 4 hours in clinical trials).
- No evidence to support it's use in managing post-operative dental pain (may also be cost prohibitive)

**Orasoothe®** (a natural oral hydrogel containing aloe, xylitol, and essential oils of cinnamon, clove, and thyme)

- The majority of medications used for pain management or wound healing are synthesized "drugs" from non-natural sources (toxicity concerns, opioid crisis, long-term harm)
- Orasoothe is made from all-natural, drug-free, non-toxic ingredients that are registered as "generally recognized as safe" (GRAS) per the FDA: aloe, xylitol, and essential oils of cinnamon, clove, and thyme

| Ingredient | Gel | Rinse | Action |
|---|---|---|---|
| Aloe Vera | ✓ | ✓ | Antimicrobial, Anti-inflammatory, Antioxidant, Pain relief |
| Xylitol | ✓ | ✓ | Antimicrobial, Caries preventive, Natural sweetener |
| Cinnamon | ✓ | ✓ | Antibacterial, Anti-inflammatory |
| Thyme | ✓ | ✓ | Antibacterial, Inhibits growth of oral pathogens |
| Clove | ✓ | ✓ | Antimicrobial, Analgesic, Used in homeopathic medicine/dental |
| Wintergreen | | ✓ | Antibacterial, Analgesic |

- Benefits include:
  - ✓ Safe if swallowed (mucositis, stomatitis)
  - ✓ Safe for all ages
  - ✓ Non-numbing (drug-free), natural pain-relief
  - ✓ "Pleasant" fragrance and taste

- "Sockit" Gel Syringe format intended for specific, localized treatment (extraction sites, along gum line, etc.)
- Primary use tied to dry-socket prevention, but also perfect for wounds/pain from bone graftings, implant surgeries, laser treatments, ulcers, and all other injuries of the oral mucosa
- Applied in office and is encouraged to be sent home with patient for continued wound treatment and pain management
- Hydrogel oral wound dressing in a rinse

**Bottom Line**

- No published peer-reviewed evidence to support its use in managing post-operative dental pain, but maybe another tool in your toolkit

## Other Notes or Questions to Ask: