Pain Management in Dentistry:
A Changing and Challenging Landscape

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In the last ten years, Dr. Moore has served as a research consultant to several companies including Dentsply Pharmaceutical, Kodak Dental Systems, Septodont USA, Novalar Inc. and Novocol of Canada Inc. His consultations have involved pharmacovigilance of current anesthetic and analgesic products as well as research protocol development of new anesthetics for dentistry.

Additionally, Dr. Moore has also served as a principal investigator or sub-investigator for FDA required Phase II Phase III and Phase IV clinical research contracts awarded to the University of Pittsburgh by Wyeth Consumer Healthcare, Novocol of Canada Inc., St. Renatus, and Novalar Pharmaceutical Inc.
Topics of Acute Pain Management

- Trends in prescription opioid use and misuse.
- OMFS practice survey of analgesics.
- Acetaminophen: New FDA requirements.
- Adjuncts for multimodal pain management.
- Stepwise prescribing for APAP + Ibuprofen.
- Safe and Responsible Prescribing.
Heath Ledger’s Overdose

Feb 6, 2008 -- A deadly cocktail of mostly prescription drugs killed Heath Ledger.
The deadly drug cocktail included:

- Oxycodone, also known under brand name OXYCOTIN, a potent painkiller.
- Hydrocodone, an ingredient in VICODIN, other painkillers, and some cough suppressants.
- Diazepam or VALIUM, an antianxiety drug sometimes prescribed as a muscle relaxant
- Alprazolam or XANAX, prescribed for panic attacks
- Temazepam or RESTORIL, prescribed for insomnia
Michael Jackson’s Overdose

✓ June 25, 2009 -- Michael Jackson died of acute propofol and benzodiazepine intoxication at his home in Los Angeles.

✓ His personal physician was convicted of involuntary manslaughter in 2011.

✓ The combination of drugs in his body included:
  The anesthetic propofol (DIPROVAN).
  The benzodiazepines lorazepam (ATIVAN), midazolam (VERSED) and diazepam (VALIUM).
Prince’s Overdose

✓ April 21, 2016 – An accidental self-administered overdose of fentanyl killed Prince.

✓ The week before his death, Prince’s plane reportedly made an emergency landing at Quad City International Airport in Moline, Illinois, as the singer was en route home from a concert in Atlanta. He was reportedly treated for: an overdose of the opioid painkiller Percocet
Unintentional Drug Overdose: 1999-2010

Legend:
- Sales per kilograms per 10,000 people
- Deaths per 100,000 people
- Treatment admissions per 10,000 people

Sources:
- Automation of Reports and Consolidated Orders System (ARCOS) of the Drug Enforcement Administration (DEA), 1999-2010
- Treatment Episode Data Set, 1999-2009
Six Days of Drug Overdose: Cincinnati

- In a six day period (August 19-24, 2016) Cincinnati area experienced 174 opioid overdose reactions.
- The culprit responsible was heroin cut with a fentanyl analogue: Carfentanyl.
- Carfentanyl is 100,000 times as potent as morphine.
- Carfentanyl is used to tranquilize elephants.
Monitoring the Future

Monitoring the Future, National Survey Results on Adolescent Drug Use, 2005.

Richard A. Friedman, NEJM 354:14, 2006
Trends for Opioids Misuse

- From 1997-2007, use increased from 74 mg/person to 369 mg/person (500% increase).
- Prescription drugs (primarily opioids) are second to marijuana in categories of abused drugs.
- For first time users, friends and family were the primary source: “the AT&T plan”.

Trends for Opioids: Overdose

• 1.2 million emergency department visits in 2009 related to misuse of prescription drugs; now outnumbering heroin and cocaine.

• 40 deaths per day in the US resulting from opioid prescription drug misuse and abuse.

• Incidence of overdose from opioids:
  
  5.5/100,000 in Nebraska

  12.6/100,000 in Florida

A total of 9.4 billion units of opioids were sold in the U.S. in 2007. (80% of total world prescriptions)

Estimated that 15% are diverted for sale on the street.

12.2% of immediate-release opioids are prescribed by dentists.

Dentist prescriptions for opioid analgesics are high for adolescents and young adults.

Dentist prescriptions:
Are for immediate release opioids (i.e. Vicodin).
Most often not refilled.
Dispensed in small quantities (16-20 pills).
Trend in prescribing rates are decreasing.
Opioid Prescriptions in Dentistry


Comprehensive National Survey

- Random national sample
- Current practicing OMFS
- 3rd molar extractions
- Pain control practices
Therapeutic Topics of Interest

✓ Anesthesia Practices
  • General Anesthesia
  • Intravenous Conscious Sedation
  • N2O/O2 Inhalational Sedation
  • Oral Sedation

✓ Preferred Agents
  • Anesthetics and Sedatives
  • Local Anesthetics
    – Surgical and Post-op pain management
  • Antibiotics and Corticosteroids
  • Post-operative Analgesics
    – Peripherally and Centrally-Acting
Preferred Peripherally-Acting Analgesics

```
<table>
<thead>
<tr>
<th>Medication</th>
<th>Percentage</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ibuprofen (Advil, Motrin)</td>
<td>73.5%</td>
<td>312</td>
</tr>
<tr>
<td>Rofecoxib (Vioxx)</td>
<td>6.1%</td>
<td>26</td>
</tr>
<tr>
<td>Naproxen (Aleve, Naproxen)</td>
<td>4.9%</td>
<td>21</td>
</tr>
<tr>
<td>Etolorac (Lodine)</td>
<td>4.5%</td>
<td>19</td>
</tr>
<tr>
<td>Ketorolac (Toradol)</td>
<td>2.3%</td>
<td>10</td>
</tr>
<tr>
<td>Valdecoxib (Bextra)</td>
<td>1.9%</td>
<td>8</td>
</tr>
<tr>
<td>Acetaminophen (Tylenol)</td>
<td>1.7%</td>
<td>7</td>
</tr>
</tbody>
</table>
```

“Please complete the following prescription for the peripherally-acting analgesic you have recommended most often in the past month.”
Ibuprofen

randomized
double-blind
clinical trial
3rd molar extractions
192 subjects
Ibuprofen vs APAP

Figure 1. Mean pain intensity difference scores vs time. Pain intensity was rated on a scale of 0 = none to 3 = severe.

### Centrally-Acting Analgesics

“What percentage of patients do you prescribe **centrally-acting analgesics (narcotic)** following third molar extractions?“

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rarely (1-20%)</td>
<td>2.9%</td>
</tr>
<tr>
<td>Sometimes (21-40%)</td>
<td>1.5%</td>
</tr>
<tr>
<td>Half the time (41-60%)</td>
<td>1.9%</td>
</tr>
<tr>
<td>Often (61-80%)</td>
<td>8.6%</td>
</tr>
<tr>
<td>Almost always (81-100%)</td>
<td>85.1%</td>
</tr>
</tbody>
</table>
Preferred Centrally-Acting Analgesics

“Please complete the following prescription for the centrally-acting analgesic you prescribed most often in the past month.”

<table>
<thead>
<tr>
<th>Medicine</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrocodone / APAP</td>
<td>64.0%</td>
</tr>
<tr>
<td>Oxycodone / APAP</td>
<td>20.2%</td>
</tr>
<tr>
<td>Hydrocodone / ibuprofen</td>
<td>4.6%</td>
</tr>
<tr>
<td>Codeine / APAP</td>
<td>4.3%</td>
</tr>
<tr>
<td>Promethazine / meperidine</td>
<td>3.7%</td>
</tr>
<tr>
<td>Propoxyphene / APAP</td>
<td>1.2%</td>
</tr>
</tbody>
</table>
# Prescription Analgesics

<table>
<thead>
<tr>
<th>Drug</th>
<th>Active Ingredient</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vicodin</td>
<td>hydrocodone/APAP</td>
<td>#1</td>
</tr>
<tr>
<td>Motrin</td>
<td>ibuprofen</td>
<td>#20</td>
</tr>
<tr>
<td>Darvocet</td>
<td>propoxyphene/APAP</td>
<td>#24*</td>
</tr>
<tr>
<td>Percocet</td>
<td>oxycodone/APAP</td>
<td>#30</td>
</tr>
<tr>
<td>Ultram</td>
<td>tramadol</td>
<td>#44</td>
</tr>
<tr>
<td>Tylenol #3</td>
<td>codeine/APAP</td>
<td>#48</td>
</tr>
<tr>
<td>Naproxen</td>
<td>naproxen</td>
<td>#61</td>
</tr>
<tr>
<td>Celebrex</td>
<td>celecoxib</td>
<td>#76</td>
</tr>
<tr>
<td>Oxycontin</td>
<td>oxycodone</td>
<td>#100</td>
</tr>
</tbody>
</table>

Verispan Scott-Levin, SPA
Prescribing vs Utilization

- Forty-eight patient interviews (1-day, 7-days).
- Age: 18.8 yrs. (15-30)
- Female = 22 / Males = 13
- 20 Vicodin® prescribed / 8 consumed at 7-days.
- Nausea/vomiting at 7-days interview: 24%.

Summary: Analgesics

- OMFS’s prescribe opioid analgesic almost always (85%) following third molar extraction surgery.

- Hydrocodone /APAP is the preferred combination analgesics. (efficacy, flexibility, marketing, side effects?)

- Instructions recommend “take as needed for pain” by 96% OMFS.

- Median dispensing of hydrocodone/APAP: 20 tabs (range 8-40).
Acetaminophen Toxicity

Acetaminophen has had a long history of safety, but concerns have been growing related to liver toxicity.
APAP and Acute Liver Failure

- 42% of all acute liver failures (ALF) are due to acetaminophen (APAP) overdoses.
- The majority of these APAP overdoses were unintentional (two or more APAP formulations).
- Even with treatment (N-acetylcysteine), 27% died.

Larson et al. Hepatology 2005;42 (6)
In Jan. 2011, FDA requested limiting APAP dose to 325 mg in opioid combination formulations such as Vicodin® and Percocet®.

FDA labeling requirement to include a box warning for liver toxicity.

Labeling of Tylenol® indicates a change in daily maximum of APAP from 4.0 grams to 3.0 grams.

Decrease units for sale OTC (16 tablets in Great Britain)

Larson et al. Hepatology 2005;42
HEPATOTOXICITY: ACETAMINOPHEN HAS BEEN ASSOCIATED WITH CASES OF ACUTE LIVER FAILURE, AT TIMES RESULTING IN LIVER TRANSPLANT AND DEATH. MOST OF THE CASES OF LIVER INJURY ARE ASSOCIATED WITH THE USE OF ACETAMINOPHEN AT DOSES THAT EXCEED 4000 MILLIGRAMS PER DAY, AND OFTEN INVOLVE MORE THAN ONE ACETAMINOPHEN -CONTAINING PRODUCT.
Tylenol OTC Labeling

- Reducing the maximum daily dose from 8 pills (4,000 mg) per day to 6 pills (3,000 mg) per day

- Changing the dosing interval from every 4-6 hours to every 6 hours.
US Sales of APAP
Hydrocodone Formulations - 2011

**Vicodan**
- hydrocodone 5.0mg / APAP 500 mg
- hydrocodone 7.5mg / APAP 750 mg (ES)
- hydrocodone 10mg / APAP 660 mg (HP)

**Lorcet**
- hydrocodone 5.0mg / APAP 500 mg (HD)
- hydrocodone 7.5mg / APAP 650 mg (PLUS)
- hydrocodone 10mg / APAP 650 mg (10/650)
Abbott’s Reformulations of Vicodin

- **Vicodin®** 5 mg hydrocodone bitartrate / 300 mg acetaminophen
- **Vicodin ES®** 7.5 mg hydrocodone bitartrate / 300 mg acetaminophen
- **Vicodin HP®** 10 mg hydrocodone bitartrate / 300 mg acetaminophen
Darvocet and Darvon Withdrawal

- Mild opioid analgesic: Schedule IV
- Propoxyphene, the active component, puts patients at risk of potentially serious or fatal heart rhythm abnormalities.
- Propoxyphene has a poor benefit to risk profile.
- November 2010, withdrawn by Elli Lilly.
Bupivacaine

- Marketed as Marcaine® and Vivacaine®
- Provides prolonged duration of soft tissue anesthesia to delay the postoperative pain (6-8 hours).
- 0.5% bupivacaine, 1:200,000 epinephrine.
- Onset time is longer (8 min. vs 4 min.) than other LA drugs b/c of elevated pKa.
- Long duration due to binding to tissue proteins.
“Which one of the following local anesthetics do you administer most frequently for anesthesia when extracting third molars?”

<table>
<thead>
<tr>
<th>Local Anesthetic Formulation</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>2% lidocaine, 1:100,000 epinephrine</td>
<td>70.4%</td>
</tr>
<tr>
<td>0.5% bupivacaine, 1:200,000 epinephrine</td>
<td>11.3%</td>
</tr>
<tr>
<td>4% articaine, 1:100,000 epinephrine</td>
<td>7.3%</td>
</tr>
<tr>
<td>4% prilocaine, 1:200,000 epinephrine</td>
<td>3.1%</td>
</tr>
<tr>
<td>2% mepivacaine, 1:20,000 levonordefrin</td>
<td>1.9%</td>
</tr>
<tr>
<td>2% lidocaine, 1:50,000 epinephrine</td>
<td>1.8%</td>
</tr>
<tr>
<td>3% mepivacaine</td>
<td>0.7%</td>
</tr>
<tr>
<td>1.5% etiodocaine, 1:200,000 epinephrine</td>
<td>0.5%</td>
</tr>
<tr>
<td>4% prilocaine</td>
<td>0.2%</td>
</tr>
<tr>
<td>Do not use local anesthetics</td>
<td>2.8%</td>
</tr>
</tbody>
</table>

Long-Acting Local Anesthetics

“How often do you use long-acting local anesthetics to manage the post-operative pain of third molar extractions? Check **ONE** box”

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>20.2%</td>
</tr>
<tr>
<td>Rarely</td>
<td>19.6%</td>
</tr>
<tr>
<td>Sometimes</td>
<td>8.0%</td>
</tr>
<tr>
<td>Half the time</td>
<td>5.7%</td>
</tr>
<tr>
<td>Often</td>
<td>10.6%</td>
</tr>
<tr>
<td>Almost always</td>
<td>35.8%</td>
</tr>
</tbody>
</table>

“95% of OMFS selected 0.5% bupivacaine, 1:200,000 epinephrine”

**Moore PA, Nahouraii HS, Zovko J, Wisniewski SR. Gen Dent 2006; 54(2):92-98.**
Post-Extraction Pain

Analgesics Following Third Molar Extractions

- mepivacaine
- bupivacaine / epi

# Ibuprofen Pretreatment

<table>
<thead>
<tr>
<th>Pretreatment</th>
<th>Pain onset (min)</th>
<th>Severity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Severe</td>
</tr>
<tr>
<td>Placebo</td>
<td>137 ± 8</td>
<td>16</td>
</tr>
<tr>
<td>Ibuprofen</td>
<td>238 ± 20</td>
<td>8</td>
</tr>
</tbody>
</table>

Dionne and Cooper; Oral Surg 45:851
Corticosteroid Use: 3rd molars

“How often do you use corticosteroids as part of your post-operative management?”

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>20.0%</td>
</tr>
<tr>
<td>Rarely</td>
<td>7.9%</td>
</tr>
<tr>
<td>Sometimes</td>
<td>6.2%</td>
</tr>
<tr>
<td>Half the time</td>
<td>5.1%</td>
</tr>
<tr>
<td>Often</td>
<td>22.8%</td>
</tr>
<tr>
<td>Almost always</td>
<td>38.0%</td>
</tr>
</tbody>
</table>

“How 90.2% of OMFS selected dexamethasone”
Dexamethasone and Third Molar Surgery

### Table III. Pain relief measures

<table>
<thead>
<tr>
<th>Treatment Groups</th>
<th>Group 1</th>
<th>Group 2</th>
<th>Group 3</th>
<th>Group 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preoperative Tx</td>
<td>Placebo</td>
<td>Rofecoxib</td>
<td>Placebo</td>
<td>Rofecoxib</td>
</tr>
<tr>
<td>Intraoperative Tx</td>
<td>Placebo</td>
<td>Placebo</td>
<td>Dexamethasone</td>
<td>Dexamethasone</td>
</tr>
<tr>
<td><strong>Time of first analgesic</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean (± SE) hours after surgery</td>
<td>3.3 (± 0.9)</td>
<td>5.0 (± 1.2)</td>
<td>3.8 (± 0.9)</td>
<td>5.6 (± 1.0)</td>
</tr>
<tr>
<td>(ANOVA; F = 1.32, P = ns)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Pain at first analgesic</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean Visual Analogue Scale (SE)</td>
<td>60.0 (7.5)</td>
<td>46.6 (9.5)</td>
<td>48.9 (7.0)</td>
<td>18.3 (8.0)**</td>
</tr>
<tr>
<td>(ANOVA; F = 5.14, P &gt; .0066)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Categorical scale</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1*</td>
</tr>
<tr>
<td>Mild</td>
<td>1</td>
<td>0</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Moderate</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Severe</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>(Chi square = 18.4, P &gt; .03)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*P < .05 compared to Group 1 (placebo/placebo).

**P < .05 compared to Groups 1, 2, and 3.
Multimodal Postoperative Pain Management

- Ice, soft diet and rest.
- Long-acting local anesthetics i.e. Marcaine.
- Primary reliance on NSAIDs (ibuprofen, naproxen) when managing dental postoperative pain.
- Steroids (dexamethasone) as an anti-inflammatory agents limit trismus and swelling.
- Use of NSAID’s pre-emptively.
Oral Surgery Model: Opioid Combinations
Ibuprofen vs. APAP/Oxycodone

*Based on only 1 to 3 studies (each with less than 300 patients)

Cochrane Database Systematic Review 2009
# OTC Analgesic Comparisons

<table>
<thead>
<tr>
<th></th>
<th>Aspirin</th>
<th>Acetaminophen</th>
<th>Ibuprofen</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Analgesic</strong></td>
<td>+++</td>
<td>+++</td>
<td>++++</td>
</tr>
<tr>
<td><strong>Antipyretic</strong></td>
<td>+++</td>
<td>+++</td>
<td>+++</td>
</tr>
<tr>
<td><strong>Anti-inflammatory</strong></td>
<td>+++</td>
<td>+</td>
<td>+++</td>
</tr>
</tbody>
</table>
Ibuprofen-Opioid Combination

Ibuprofen and APAP
## Ibuprofen and APAP

**Table IV. Onset and duration of analgesic efficacy in the 5 treatment groups (intent-to-treat population) of patients undergoing surgical removal of impacted molars. Data are mean minutes (number of patients meeting the end point), except as indicated.**

<table>
<thead>
<tr>
<th>Kaplan-Meier End Point*</th>
<th>Ibuprofen 400 mg/Paracetamol 1000 mg (n = 67)</th>
<th>Ibuprofen 200 mg/Paracetamol 500 mg (n = 33)</th>
<th>Ibuprofen 400 mg (n = 69)</th>
<th>Paracetamol 1000 mg (n = 34)</th>
<th>Placebo† (n = 31)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time to PID ≥1 Efficacy ranking (A–D)</td>
<td>38.0 (60) A</td>
<td>51.2 (31) A, B</td>
<td>80.1 (59) B</td>
<td>61.4 (30) A, B</td>
<td>157.3 (7) C</td>
</tr>
<tr>
<td>Time to first confirmed perceptible pain relief Efficacy ranking (A–D)</td>
<td>23.2 (52) A</td>
<td>21.8 (26) A</td>
<td>48.6 (48) B</td>
<td>24.8 (18) B</td>
<td>97.5 (2) C</td>
</tr>
<tr>
<td>Time to first meaningful pain relief Efficacy ranking (A–D)</td>
<td>93.6 (52) A, B</td>
<td>74.0 (26) A</td>
<td>123.9 (47) A, B</td>
<td>141.0 (18) B</td>
<td>132.8 (2) C</td>
</tr>
<tr>
<td>Time to pain half gone Efficacy ranking (A–D)</td>
<td>69.3 (65) A, B</td>
<td>85.9 (32) A, B</td>
<td>113.7 (65) A, B</td>
<td>135.2 (32) B</td>
<td>229.1 (30) C</td>
</tr>
<tr>
<td>Time to use of rescue medication Efficacy ranking (A–D)</td>
<td>376.3 (21) A</td>
<td>328.5 (20) B</td>
<td>296.2 (47) B</td>
<td>261.2 (24) B</td>
<td>144.4 (28) C</td>
</tr>
</tbody>
</table>

PID = pain intensity difference.

*Treatments were ranked A to D, with A denoting the most effective treatment; the same letter for 2 treatments means no significant difference between treatments. No comparison was made between ibuprofen alone and paracetamol alone, so they are indicated as not significantly different.
## Ibuprofen and APAP

Table V. Frequency (>5% of patients) of adverse events (AEs) in the 5 treatment groups of patients undergoing surgical removal of impacted molars. Data are number (%).

<table>
<thead>
<tr>
<th>AE</th>
<th>Ibuprofen 400 mg/Paracetamol 1000 mg (n = 67)</th>
<th>Ibuprofen 200 mg/Paracetamol 500 mg (n = 33)</th>
<th>Ibuprofen 400 mg (n = 69)</th>
<th>Paracetamol 1000 mg (n = 34)</th>
<th>Placebo (n = 31)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any AE</td>
<td>38 (56.7)</td>
<td>14 (42.4)</td>
<td>39 (56.5)</td>
<td>24 (70.6)</td>
<td>21 (67.7)</td>
</tr>
<tr>
<td>Treatment-related AE</td>
<td>10 (14.9)</td>
<td>6 (18.2)</td>
<td>19 (27.5)</td>
<td>12 (35.3)</td>
<td>13 (41.9)</td>
</tr>
<tr>
<td>Severe AE</td>
<td>11 (16.4)</td>
<td>6 (18.2)</td>
<td>14 (20.3)</td>
<td>11 (32.4)</td>
<td>11 (35.5)</td>
</tr>
<tr>
<td>Nausea</td>
<td>15 (22.4)</td>
<td>7 (21.2)</td>
<td>18 (26.1)</td>
<td>10 (29.4)</td>
<td>11 (35.5)</td>
</tr>
<tr>
<td>Vomiting</td>
<td>9 (13.4)</td>
<td>4 (12.1)</td>
<td>13 (18.8)</td>
<td>10 (29.4)</td>
<td>8 (25.8)</td>
</tr>
<tr>
<td>Headache</td>
<td>5 (7.5)</td>
<td>1 (3.0)</td>
<td>9 (13.0)</td>
<td>7 (20.6)</td>
<td>2 (6.5)</td>
</tr>
<tr>
<td>Dizziness</td>
<td>2 (3.0)</td>
<td>1 (3.0)</td>
<td>6 (8.7)</td>
<td>7 (20.6)</td>
<td>3 (9.7)</td>
</tr>
</tbody>
</table>
NNTs for Analgesic Agents
## NNTs for Dental Analgesics

<table>
<thead>
<tr>
<th>Drug Formulation</th>
<th>Trials/Subjects</th>
<th>NNT (C.I.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspirin 600/650 mg</td>
<td>45/3581</td>
<td>4.5 (4.0-5.2)</td>
</tr>
<tr>
<td>Aspirin 1,000 mg</td>
<td>4/436</td>
<td>4.2 (3.2-6.0)</td>
</tr>
<tr>
<td>Acetaminophen 1,000 mg</td>
<td>19/2157</td>
<td>3.2 (2.9-3.6)</td>
</tr>
<tr>
<td>Ibuprofen 200 mg</td>
<td>18/2470</td>
<td>2.7 (2.5-3.0)</td>
</tr>
<tr>
<td>Celecoxib 400 mg</td>
<td>4/620</td>
<td>2.5 (2.2-2.9)</td>
</tr>
<tr>
<td><strong>Ibuprofen 400 mg</strong></td>
<td>49/5428</td>
<td><strong>2.3 (2.2-2.4)</strong></td>
</tr>
<tr>
<td>Oxycodone 10 mg plus Acetaminophen 650 mg</td>
<td>6/673</td>
<td>2.3 (2.0-6.4)</td>
</tr>
<tr>
<td>Codeine 60 mg plus APAP 1000 mg</td>
<td>26/2295</td>
<td>2.2 (1.8-2.9)</td>
</tr>
<tr>
<td>Naproxen 500/550 mg</td>
<td>5/402</td>
<td>1.8 (1.6-2.1)</td>
</tr>
<tr>
<td><strong>Ibuprofen 200 mg plus</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acetaminophen 500 mg</td>
<td>2/280</td>
<td>1.6 (1.4-1.8)</td>
</tr>
</tbody>
</table>
Stepwise Guidelines

Mild Pain
Ibuprofen 200-400 mg
q 4-6 hours: as needed (p.r.n.) pain

Mild-Moderate Pain
Ibuprofen 400-600 mg
q 4-6 hours: fixed interval for 24 hours

Moderate - Severe Pain
Ibuprofen 400-600 mg plus APAP 500 mg
q 6 hours: fixed interval for 24 hours

Severe Pain
Ibuprofen 400 mg plus APAP 650/hydrocodone 10 mg
q 6 hours: fixed interval for 24-48 hours
Issues in Therapeutics

✓ Changes in drug therapy for post-operative dental pain management.
  • No longer prescribing Darvocet or Tylenol #3.
  • Limiting dose of APAP in combination analgesics.
  • Long-acting local anesthetics i.e. Marcaine
  • High efficacy of NSAIDs in dental post-op pain.
  • Steroids as an antiemetic and an anti-inflammation.
  • Prophylactic NSAID’s.
  • APAP-Ibuprofen

✓ Balancing pain management and potential misuse.
National Issues in Opioid Therapeutics

- Expand take-back programs.
- Educational requirements for DEA registration.
- REMS: Opioid Risk Evaluation and Mitigation Strategies.
- Expand dental school accreditation curriculums in anesthesia and pain control.
- PDMPs: Electronic State sponsored prescription drug monitoring programs.
- Revise opioid formulation DEA scheduling.
Provider Issues in Opioid Therapeutics

- Limiting prescriptions with fewer units of opioids. (No refills, 8 units?, 20 units?, 40 units?)
- Counsel parents and patients of dangers. This may be our most important “teaching opportunity for first time users of anesthetics and analgesic drugs”
- Parent responsibility as the “gatekeeper” to monitor pain and analgesia needs.
- Recommend strategies to secure prescriptions.
- Indicate DEA drug take-back programs.
- Describe procedures for disposal of unused drug.
Take them out of their original containers and mix them with an undesirable substance, such as used coffee grounds or kitty litter. The medication will be less appealing to children and pets, and unrecognizable to people who may intentionally go through your trash. Put them in a sealable bag, empty can, or other container to prevent the medication from leaking or breaking out of a garbage bag.

- Cat litter
- Coffee grinds
- Take back programs
- Flush it done!
Prescription Drug Disposal: Flushing

Fentanyl: Duragesic, patch (extended release)
Methylphenidate
Meperidine: Demerol, tablets
Diazepam
Hydromorphone HCl: Dilaudid, tablets, oral liquid
Methadone: Dolophine Hydrochloride, tablets
Morphine: Embeda, capsules (extended release)
Hydromorphone Hydrochloride
Methadose, tablets
Morphine Sulfate, tablets (immediate release)
Oxycontin, tablets
Percocet, tablets & Percodan, tablets
APAP /Ibuprofen Reviews

Moore PA and Hersh EV.
Combining Ibuprofen and Acetaminophen for Acute Postoperative Pain Management: Translating Clinical Research to Dental Practice.

Guggenheimer J and Moore PA.

Moore PA and Hersh EV.

Moore PA, Dionne RA, Cooper SA, and Hersh EV.

Request at: pam7@pitt.edu
Providers’ Clinical Support System for Opioid Therapies (PCSS-O) Training

PCSS-O is a collaborative effort led by the American Academy of Addiction Psychiatry (AAAP) in partnership with: Addiction Technology Transfer Center (ATTC), American Academy of Neurology (AAN), American Academy of Pain Medicine (AAPM), American Academy of Pediatrics (AAP), American College of Physicians (ACP), American Dental Association (ADA), American Medical Association (AMA), American Osteopathic Academy of Addiction Medicine (AOAAM), American Psychiatric Association (APA), American Society for Pain Management Nursing (ASPMN), International Nurses Society on Addictions (IntNSA), and Southeast Consortium for Substance Abuse Training (SECSAT).

For more information visit: www.pcss-o.org
For questions, email: pcss-o@aaap.org
Visit us on Twitter: @PCSSProjects

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Webinar Evaluations (Post and 30-Day)

Each PCSS-O partner organization is asked to distribute a post and 30-day evaluation to participants for their completion.

Participants in today’s webinar will be emailed the following link to complete their evaluation:

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