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Short Communication

Post-Operative Pain and the Opioid Crisis

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Pain comes from the Latin word Poena, meaning "punishment, penalty, retribution, indemnification, torment, hardship, suffering" [1]. Pain is what we don't want our patients to feel, but it is exactly what the City of Philadelphia and the entire country is experiencing with the opioid crisis. "115 people die each day from opioid overdose in America, which is one person every 12.5 minutes" [2].

There were 907 recorded deaths from drug overdoses in the city of Philadelphia, PA in 2016. Eighty percent of these overdose deaths involved opioids (including prescription opioids), the most commonly represented opioids were heroin and fentanyl [3]. Four out of five new heroin users began use after being prescribed opioids [4] and dentists account for a significant number of those prescriptions being the third most frequent prescriber of opioids [5]. Of note, the median duration of opioid drugs prescribed by dentists is usually only for 3 days.

As health care providers who provide surgical procedures that require acute pain management, it is imperative that dentists recognize the options available for pain management. These analgesics include non-steroidal anti-inflammatories (NSAIDS), acetaminophen (APAP), long acting local anesthetics, and opioids. Acute inflammatory pain is the most common pain encountered in dental offices. Inflammatory pain is often secondary to acute odontogenic infection or post-surgical pain in the dental office.

NSAIDS primarily function by decreasing inflammation and states of hyperalgesia following surgical trauma. At an intracellular level, NSAIDS inhibit prostaglandins from being synthesized by inhibiting cyclooxygenase enzymes decreasing inflammation and hyperalgesia associated with surgical trauma and other insults.

Acetaminophen (APAP) does not have a clear mechanism of action, but has been shown to have pain relief for four hours without inhibiting platelet aggregation. The theorized mechanism of action is that it works to selectively block COX-3 (located only in brain and spinal cord) which subsequently reduces the production of prostaglandins being synthesized in those areas. Of note, caution should be utilized to avoid potential hepatic toxicity when prescribing acetaminophen. The manufacture of Tylenol has reduced the daily dose recommendation from 4,000 mg to 3,000 mg.

Long acting local anesthetic agents such as bupivacaine have been proven as an adjunct to provide soft-tissue and periosteal anesthesia.

A systematic review of the literature published in 2013 showed that multimodal analgesia techniques of ibuprofen combined with acetaminophen are more effective with less adverse effects than opioids. Moore offered guidelines for managing post-operative pain in dentistry based on pain severities of mild, mild to moderate, moderate to severe and severe. For mild pain, ibuprofen 200 - 400 mg as needed for pain every four to six hours is recommended. For mild to moderate pain, ibuprofen 400 - 600 mg every six hours for the first 24 hours is recommended. Pain that is moderate to severe; ibuprofen of 400 - 600 mg with APAP (500 mg) every six hours for the first 24

hours, then ibuprofen (400 mg) with APAP (500 mg) every 6 hours as needed for continued pain. For severe pain, ibuprofen (400 - 600 mg) with APAP (650 mg) with hydrocodone (10 mg) every six hours for a 24 hours, then ibuprofen (400 - 600 mg) with APAP (500 mg) every six hours as need for pain [6].

A randomized controlled trial from 2010 found that ibuprofen 400 mg combined with acetaminophen 1,000 mg was found to be the most effective analgesic available in the United States for acute pain. The next most effective analgesic was ibuprofen 200 mg combined with acetaminophen 500 mg followed by acetaminophen 1,000 mg combined with oxycodone 10 mg. Investigators determined the analgesia efficacy by determining the number of patients needed to treat for benefit (NNTB). NNTB It is the number of people who experienced at least 50% maximum pain relief over 4 to 6 hours. The lower the NNTB, the more effective the analgesic agent [7].

Drug	NNTB	95% Confidence Interval
Ibuprofen 400 mg with acetaminophen 1,000 mg	1.5	1.4 - 1.7
ibuprofen 200 mg with acetaminophen 500 mg	1.6	1.5 - 1.8
acetaminophen 1,000 mg with oxycodone 10 mg	1.8	1.6 - 2.2
Diclofenac (Potassium), 100 mg	1.9	1.7 - 2.3
Ketoprofen 25 mg	2.0	1.8 - 2.3

Investigators found that for people with private insurance, the rate of opioid prescriptions has increased for those aged 11- 18 years old from 2010 - 2015. Among high school seniors, 36.9% of nonmedical users of prescription opioids used drugs from previous prescriptions, in which 27% of those prescriptions were prescribed by dentists [8]. Making things worse, 54% of opioids in one study remained unused 21 days after surgical tooth extractions [9], clearly contributing to drug diversion.

Educating the patient begins with the very first appointment as to the medications they will be receiving. Literature has shown that patient education about pain management improves patient satisfaction in the clinical setting. Risks, benefits and alternatives should be discussed when prescribing any medication just as when presenting the treatment plan.

Before we can educate our patients, we need to educate ourselves. All dental school curriculums should be modified to emphasize screening, and treatment management.

By changing prescription patterns to follow evidence-based dentistry, educating patients and future practitioners, dentists can become leaders in the opioid crisis rather than contributors to the growing opioid epidemic [10].

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