

Policy on Acute Pediatric Dental Pain Management

Review Council

Council on Clinical Affairs

Latest Revision

2017

Purpose

The American Academy of Pediatric Dentistry (AAPD) recognizes that children vary greatly in their cognitive and emotional development, medical conditions, and responses to pain and interventions. Infants, children, adolescents, and those with special health care needs can and do experience pain, and the majority of pain in the dental setting can be prevented or substantially relieved. The AAPD further recognizes that there are many therapeutics available to treat pain with varying dosages and/or regimens. Recent concerns have developed about toxicities associated with codeine.

Methods

This policy was developed by the Council on Clinical Affairs and adopted in 2012. This document is an update of the previous version and is based on a review of current dental and medical literature pertaining to pediatric pain management including a search with PubMed®/MEDLINE using the terms: pediatric dental pain management, pediatric pain management, pediatric postoperative pain management, pediatric analgesic overdose; fields: all; limits: within the last ten years, humans, all children zero to 18 years, English, clinical trials, and literature reviews. The search returned 3,388 articles. The reviewers agreed upon the inclusion of 12 new documents that met the defined criteria. Nine additional documents were retained from the previous version of the policy for historical purposes. When data did not appear sufficient or were inconclusive, information included in this police was based upon expert and/or consensus opinion by experienced researchers and clinicians

Background

Pain assessment is an integral component of the dental history and comprehensive evaluation. When symptoms or signs of orofacial/dental pain are evident, a detailed pain assessment should be conducted and documented in the patient's record. This assessment helps the dentist to derive a clinical diagnosis, develop a prioritized treatment plan, and better estimate analgesic requirements for the patient.

Pain is difficult to measure due to its subjectivity, especially in children,^{1,2} and often relies on the report of parents. There are several pain scale indicators that can be used with children, including the FACES pain scale and the Wong-Baker FACES scale.^{1,2} The method of assessing pain selected by the practitioner must accurately reflect pain intensity. Pain

experienced by children with special health care needs or developmental disabilities is more challenging to assess accurately and may require utilization of scales that rely on observations such as vocalization, facial expressions, and body movements.³⁻⁵

In addition to documenting pain severity, it is important to assess pain onset, pattern, location, and quality; aggravating and relieving factors; previous treatment and its effect; and barriers to assessment.⁶ When assessing pain in a child, the patient's psychological status should be considered. The dentist also should account for the intensity and duration of pain that may be perceived from a given dental procedure.^{7,8} Pain management may range from non-pharmacologic modalities to pharmacological treatment. Nonpharmacologic therapy includes maintaining a calm environment, encouraging deep breathing, and employing guided imagery, distraction, play therapy, and tell-show-do.⁹ Pharmacologic therapy may consist of administration of topical and local anesthesia, analgesic medications, and/or mild, moderate, or deep sedation regimens.^{9,10}

The extent of treatment affects post-operative pain. It has been reported that 95 percent of children undergoing full mouth dental rehabilitation, regardless of extent of treatment, report pain of moderate intensity.⁸ Pain scores usually are highest immediately postoperatively while the patient is in the post-anesthesia recovery unit.⁸ Due to analgesics and/or local anesthetics administered intra-operatively during dental rehabilitation, some patients may be delayed in their pain response and report greater intensity of pain at home following the procedures. Patients who had extractions, as well as those who had 12 or more dental procedures, were more likely to experience pain at home.⁸

The selection of an appropriate analgesic depends on the individual patient, the extent of treatment, the duration of the procedure, psychological factors, and the patient's medical history. Physiologic factors such as bleeding disorders, liver problems, and kidney problems should be given particular attention since some analgesics may promote bleeding.¹¹ If moderate to severe pain is considered likely, an analgesic

ABBREVIATIONS

AAPD: American Academy Pediatric Dentistry. **FDA:** Food and Drug Administration. **NSAIDs:** Nonsteroidal anti-inflammatory agents.

should be administered on a regular schedule during the first 36 to 48 hours to create stable plasma levels of analgesics and decrease the chance of breakthrough pain.^{11,12}

Treatment of postoperative pain may include opioid analgesics and non-opioid analgesics. Since most cases of postoperative pain include an inflammatory component, nonsteroidal anti-inflammatory agents (NSAIDs) are considered first line agents in the treatment of acute mild to moderate postoperative pain.¹¹ Aspirin-containing analgesics are contraindicated for pediatric pain management in most situations because, if administered during a viral illness, the potential exists for a serious condition known as Reye syndrome.¹³ Acetaminophen lacks anti-inflammatory properties but can be a non-opioid alternative when NSAIDs are contraindicated.¹¹ Acetaminophen is found as a single agent and also in combination with other drugs. Overdose of acetaminophen is a potential pediatric emergency, and the maximum daily dose should be observed, especially when combination medications are used.¹⁴ Alternating administration of ibuprofen and acetaminophen is another strategy for pain management in children.^{6,15} Acetaminophen or NSAIDs also can be administered rectally or intravenously, which may be practical in some settings (e.g., an operating room).¹³

Practitioners may be hesitant to prescribe opioid analgesics for pediatric patients for fear of addiction. Because opioid use for dental pain should be of short duration, physical dependence is unlikely and its use should be considered.¹² Opioid analgesics are effective for moderate to severe postoperative pain, but have potential for adverse effects (e.g., nausea, emesis, constipation, sedation, respiratory depression) and diversion.¹⁵⁻¹⁷ Parental anxiety about postoperative pain and potential adverse effects of pain medications may influence administration of analgesics at home.^{6,7} Strategies that educate parents about anticipated postoperative discomfort and the benefits of pain medication have been associated with reduced reports of pain in pediatric patients.⁷ Parental education, expectation management, and effective use of non-opioid analgesics are keys in reducing adverse effects of opioid analgesics. Opioid analgesics such as hydrocodone and oxycodone are often combined with acetaminophen. Concomitant or alternating opioid administration with ibuprofen can reduce opioid consumption.

Codeine, a prodrug that is metabolized into morphine in the liver, has been removed from many hospital formularies due to safety concerns.¹⁸⁻²⁰ Individual response to codeine ranges from high sensitivity to no effect at all due to genetic variability.^{19,20} A genetic polymorphism of the liver cytochrome enzyme CYP2D6 causes some patients to be ultra-rapid metabolizers of codeine.¹⁸ Ultimately, these patients convert codeine into high levels of morphine very quickly. For this reason, postoperative use of codeine has been associated with undesirable consequences including death in infants and children.¹⁸⁻²⁰ Another variant of CYP2D6 may cause patients to be poor metabolizers of codeine and, consequently, under-respond to the opioid.²⁰ Repeated doses of codeine-containing analgesics in these patients fail to result in adequate analgesia since

codeine is not effectively broken down into the active metabolite morphine.²⁰ Tests cleared by the U.S. Food and Drug Administration (FDA) are available and could be considered to identify both ultra-rapid and poor metabolizers of codeine and other opioid analgesics.¹⁸ Tramadol and, to a lesser extent, hydrocodone and oxycodone also are influenced by CYP2D6 activity, and ultra-rapid metabolizers may have an increased risk of toxicity.²⁰ In April, 2017, the FDA issued a warning to restrict the use of codeine and tramadol medicines in children and breastfeeding mothers.²¹ Morphine and non-opioid alternatives are not influenced by CYP2D6 metabolism.²⁰

Policy statement

The AAPD recognizes that children experience pain and exhibit variability in the expression of pain and that inadequate pain management may have significant physical and psychological consequences for the patient. Therefore, the AAPD encourages health care professionals to:

- recognize, assess, and document symptoms of pain in the patient's record.
- consider preoperative, intraoperative, and postoperative pain management options.
- use non-pharmacologic and pharmacologic strategies to reduce pain experience.
- utilize drug formularies in order to accurately prescribe medications for the management of pain.
- choose agents compatible with the patient's medical history.
- comprehend the consequences, morbidities, and toxicities associated with the use of specific therapeutics.
- consider non-opioid analgesics as first line agents for pain management.
- consider simultaneous use of analgesics with different mechanisms of action to optimize pain management. Combining opioid analgesics with NSAIDs or acetaminophen for moderate to severe pain may decrease overall opioid consumption.
- support additional clinical research to extend the understanding of the risks and benefits of both opioid and nonopioid alternatives for orally-administered, effective agents for acute and chronic pain.¹⁹

The AAPD supports the FDA's April, 2017 safety communication²¹ which states that codeine and tramadol are contraindicated for treatment of pain in children younger than 12 years.

References

1. Barrêto EPR, Ferreira EF, Pordeus IA. Evaluation of toothache severity in children using a visual analog scale of faces. *Pediatr Dent* 2004;26(6):485-91.
2. Jain A, Yeluri R, Munshi AK. Measurement and assessment of pain in children. *J Clin Pediatr Dent* 2012;37(20):125-36.

3. Institute of Medicine. *Relieving Pain in America: A Blueprint for Transforming Prevention, Care, Education, and Research*. Washington, D.C.: The National Academies Press. Available at: "<http://www.uspainfoundation.org/wp-content/uploads/2016/01/IOM-Full-Report.pdf>" Accessed December 10, 2016. (Archived by WebCite® at: "<http://www.webcitation.org/6mefMJ1cd>")
4. Feldt KS. The checklist of nonverbal pain indicators (CNPI). *Pain Manag Nurs* 2000;1(1):13-21.
5. Merkel SI, Voepel-Lewis T, Shayevitz JR, Malviya S. The FLACC: A behavioral scale for scoring postoperative pain in young children. *Pediatr Nurs* 1997;23(3):293-7.
6. Chou R, Gordon DB, de Leon-Cassola OA, et al. Guidelines on the management of postoperative pain. Management of postoperative pain: A clinical practice guideline from the American Pain Society, American Society of Regional Anesthesia and Pain Medicine, American Society of Anesthesiologists' Committee on Regional Anesthesia, Executive Committee, and Administrative Counsel. *J Pain* 2016;17(2):131-57.
7. American Academy of Pediatrics, American Pain Society. The assessment and management of acute pain in infants, children and adolescents. *Pediatrics* 2001;108(3):793-7.
8. Needleman HL, Harpayat S, Wu S, Allred EN, Berde C. Postoperative pain and other sequelae of dental rehabilitations performed on children under general anesthesia. *Pediatr Dent* 2008;30(2):111-21.
9. Lee GY, Yamada J, Kyololo O, Shorkey A, Stevens B. Pediatric clinical practice guidelines for acute procedural pain: A systematic review. *Pediatr* 2014;133(3):500-15.
10. American Academy of Pediatric Dentistry. Use of local anesthesia for pediatric dental patients. *Pediatr Dent* 2017;39(6):266-72.
11. Becker DE. Pain management: Part 1: Managing acute and postoperative dental pain. *Anesth Prog* 2010;57(2):67-79.
12. Sutters KA, Miaskowsk C, Holdridge-Zeuner D, et al. A randomized clinical trial of the efficacy of scheduled dosing of acetaminophen and hydrocodone for the management of postoperative pain in children after tonsillectomy. *Clin J Pain* 2010;26(2):95-103.
13. Ruest C, Anderson A. Management of acute pediatric pain in the emergency department. *Curr Opin Pediatr* 2016;28(3):298-304.
14. American Association of Poison Control Centers. Practice guideline: Acetaminophen poisoning: An evidence-based consensus guideline for out-of-hospital management. *Clin Toxicol* 2006;44(1):1-18.
15. Liu C, Ulualp SO. Outcomes of an alternating ibuprofen and acetaminophen regimen for pain relief after tonsillectomy in children. *Ann Otol Rhinol Laryngol* 2015;124(10):777-81.
16. Yaksh TL, Wallace MS. Opioids, analgesia and pain management. In: Brunton LL, Chabner BA, Knollmann BS, eds. *Goodman and Gilman's the Pharmacological Basis of Therapeutics*. 12th ed. New York, N.Y.: McGraw-Hill; 2010:481-526.
17. Dionne R, Moore P. Opioid prescribing in dentistry: Keys for safe and proper usage. *Compend* 2016;37(1):21-34.
18. U.S. Food and Drug Administration. Drug Safety Communication: Safety review update of codeine use in children; New boxed warning and contraindication on use after tonsillectomy and/or adenoidectomy. Available at: "<http://www.fda.gov/drugs/drugsafety/ucm339112.htm>" Accessed December 10, 2016. (Archived by WebCite® at: "<http://www.webcitation.org/6mee873Qm>")
19. Tobias JD, Green TP, Coté CJ, American Academy of Pediatrics Section on Anesthesiology and Pain Medicine, American Academy of Pediatrics Committee on Drugs. Codeine: Time to say "No". *Pediatrics* 2016;138(4):e20162396. Available at: "<http://pediatrics.aappublications.org/content/pediatrics/early/2016/09/15/peds.2016-2396.full.pdf>". Accessed July 1, 2017. (Archived by WebCite® at: "<http://www.webcitation.org/6sjq8xsf>")
20. Crews KR, Gaediek A, Dunnenberger HM. Clinical Pharmacogenetics Implementation Consortium – guidelines for cytochrome p450 2D6 genotype and codeine therapy: 2014 update. *Clin Pharmacol Ther* 2014;95(4):376-82.
21. U.S. Food and Drug Administration. Drug Safety Communication: FDA restricts use of prescription codeine pain and cough medicines and tramadol pain medicines in children; recommends against use in breastfeeding women. Available at: "<https://www.fda.gov/Drugs/DrugSafety/ucm549679.htm>". Accessed May 26, 2017. (Archived by WebCite® at: "<http://www.webcitation.org/6sjqTDBYs>")