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Commentary

Pain following pediatric tonsillectomy and adenoidectomy: What do we know about home pain management?

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More than a decade has passed since mothers described their pain management interventions for their children's postoperative tonsillectomy and adenoidectomy (T & A) care as "trial and error" (Gedaly-Duff & Ziebarth, 1994). The purpose of this commentary is to explore the state of the science of pediatric home pain management following T & A and to reflect upon directions for future research.

Pediatric T & A postoperative home pain experiences

Foundational research about pediatric home pain following T & A was built from parental reports of their child's pain (Gedaly-Duff & Ziebarth, 1994; Finley et al., 1996; Sutters & Miaskowski, 1997; Homer et al., 2001; Hamers & Abu-Saad, 2002). Finley et al. (1996) reported that children following T & A had significant pain, but 42% of their parents felt pain medication should be administered only as a last resort. Other researchers (Warnock & Lander, 1998; Seid & Varni, 1999; Helgadóttir & Wilson, 2004; Sutters et al., 2004, 2007; Idvall et al., 2005; Wiggins & Foster, 2007) used children's pain intensity self-reports to confirm the severity of postoperative T & A pain.

The experience of T & A postoperative pain includes moderate to severe throat pain which continues for 3 to 5 days. In addition to throat pain, children may also experience ear pain by the fourth day. T & A postoperative pain lasts from 7 days to 2

weeks with a gradual decline in intensity until only swallowing pain exists (Gedaly-Duff & Ziebarth, 1994; Helgadóttir & Wilson, 2004; Sutters et al., 2004; Warnock & Lander, 1998; Wiggins & Foster, 2007).

Child self-reports and parental proxy reports of pain may not give a full description of the concerns. During home recovery following T & A, children were asked to use a body outline (Savedra et al., 1989; Van Cleve & Savedra, 1993) to map their pain. Children marked throat and additional pain sites including: headache, stomachache, tongue soreness, and chapped lips (Wiggins & Foster, 2007). In this same study children expressed concern that they were unable to breathe due to tongue and throat swelling and that they felt exhausted due to night time sleep disruptions. Furthermore, these symptoms were frightening for the children.

Symptoms associated with T & A home pain and recovery

Inadequate symptom management at home makes recovery difficult for children. Approximately 30% of children reported nausea and vomiting during home recovery (Sutters et al., 2004; Huth & Broome, 2007; Wiggins & Foster, 2007). The lack of fluid intake, in addition to nausea and vomiting, increased the risk for dehydration in these same children (Sutters et al., 2004; Huth & Broome, 2007; Wiggins & Foster, 2007). Children, who had

higher pain intensity experiences, also described more unpleasant symptoms than children who reported less pain (Sutters & Miaskowski, 1997; Helgadóttir & Wilson, 2004). Higher levels of preoperative anxiety in children (5-12 years of age) are associated with more postoperative pain and behavioral problems (Kain et al., 2006). Families whose children have T & A for chronic sleep disordered breathing have concerns about apnea and behavioral problems during recovery (Mitchell, 2007; Wei et al., 2007). Parents report difficulty knowing how to respond to these symptoms (Gedaly-Duff & Ziebarth, 1994; Seid & Varni, 1999).

Family interventions used for T & A pain at home

Family administration of analgesics is an essential home care intervention. Research has documented that children at home following T & A are administered only about 50% of their prescribed analgesics (Helgadóttir & Wilson, 2004; Wiggins & Foster, 2007). It is unclear why parents do not consistently administer pain medication even in the presence of the child's report of severe pain (Sutters & Miaskowski, 1997; Hamers & Abu-Saad, 2002). Parents may underestimate the severity of the child's pain report (Singer et al., 2002). Parents have described concerns about analgesic over-medication and fears of narcotic addiction (Gedaly-Duff & Ziebarth, 1994; Finley et al., 1996; Kankkunen et al., 2003a; Helgadóttir & Wilson, 2004; Idvall et al., 2005).

Parental concerns about analgesic administration may be related to the child's refusal to swallow. Pain intensity with swallowing and without swallowing was compared, with children rating both as moderate to severe during the early postoperative days (Sutters et al., 2004). Researchers suggested that they were uncertain if children were unable to distinguish the differences in pain intensity during the early postoperative period or if swallowing liquids does not contribute to increased pain (Sutters et al., 2004). Liquid analgesics such as acetaminophen with codeine have been associated with side effects such as stomach pain, nausea, and vomiting (Sutters et al., 2005). Children may refuse pain medication if they

have experienced unpleasant side effects. Clearly there are multiple factors that should be considered when designing interventions that will improve analgesic administration.

Furthermore, parents may believe that ambulatory surgery would not contribute to severe pain. Educating parents to recognize the importance of using their child's pain intensity report as an indicator of how to intervene is essential for effective management. Although young children from 3 to 7 years of age and children with cognitive or developmental delays may have difficulty giving accurate self-report (American Pain Society, 2006), parents can be taught to assess pediatric pain using multiple indicators. The Parents' Postoperative Pain Measure (PPPM) is an objective pain assessment tool. This tool uses behavioral measures of child distress rather than subjective estimates of pain intensity (Chambers et al., 1996; Finley et al., 2003).

Family attitudes remain an obstacle to decision-making even though pain assessment tools facilitate pain identification (Forward et al., 1996). Seid and Varni (1999) developed an algorithm intervention to assist parents with decision-making. This algorithm was designed so the parent would administer analgesics appropriate for the child's pain intensity score. Although children in the algorithm intervention returned to school sooner, parents reported it was difficult to use the algorithm for more than a few days. In an educational intervention, parents who read a pamphlet about pediatric pain management were shown to have a more positive attitude toward the use of analgesics (Chambers et al., 1997). However, this same intervention did not change parental behaviors toward offering analgesia more frequently. Huth and Broome (2007) described the need for multimodal teaching at discharge from hospital to improve family home pain management.

Pharmacological interventions

It remains a challenge to identify the best analgesic for home pain management. Over the past decade, analgesic research related to T & A home care has explored the use of plain acetaminophen and opioid/acetaminophen combinations. There is not clear evidence about the type of analgesic or dosage frequency that is most effective for home T

& A pain relief (Hamunen & Kontinen, 2005). Plain acetaminophen in usual or higher (90 mg/kg/24 hr) dosages does not adequately reduce pain during the early postoperative period (Rømsing et al., 1998, 2000). Night and early morning awakenings at home are related to breakthrough pain resulting from a decline in analgesic administration during night time sleep (Hamers & Abu-Saad, 2002; Helgadóttir & Wilson, 2004; Wiggins & Foster, 2007). Although around the clock (ATC) administration of pain medication has been effective for breakthrough pain (McClain, 2006), parents are often reluctant to awaken sleeping children for night time analgesic administration.

Sutters et al. (2004) developed a randomized clinical trial (RCT) for postoperative T & A home pain management that included experimental groups assigned to ATC analgesia and a control group assigned to as needed (PRN) analgesia. Children assigned to the ATC intervention groups were administered more analgesics, however, the ATC intervention did not show a statistically significant reduction in pain intensity when compared with the PRN controls. Researchers compared analgesic side effects between ATC and PRN groups from the same RCT and noted no group differences in the side effects (Sutters et al., 2005). Francis-Baldesari et al. (2007) have developed a Cochrane review protocol for analgesia for pediatric postoperative pain following T & A. Upon completion, this evidenced-based review will offer insight into the current analgesic management of T & A home pain in children.

Preoperative preparation has decreased anxiety in children and parents prior to the ambulatory surgery experience (Huth et al., 2004; McEwen et al., 2007). In addition, new surgical interventions for tonsil removal such as coblation (Chang, 2005) and tonsillotomy with radiofrequency techniques (Hultcrantz & Ericsson, 2004) demonstrate less postoperative pain and shorter recovery time than the traditional tonsillectomy with electrocautery. Thus there has been progress with pre- and intra-operative interventions to reduce anxiety and recovery time in the surgical setting.

Non-pharmacological pain interventions

Non-pharmacological interventions should be used in conjunction with medications to improve pain management (American Pain Society, 2006). Children described that interventions such as family presence, pets, games, movies, and music were comforting during home recovery (Kankkunen et al., 2003b; Wiggins & Foster, 2007). In contrast, formal cognitive-behavioral interventions for T & A pain such as imagery had more successful application in the ambulatory setting than in the home (Huth et al., 2004). There is a need to develop more RCTs which explore how non-pharmacological pain interventions can be implemented in the home.

Future directions

Pediatric postoperative home care can no longer be described as “trial and error”. Research efforts have included RCTs that have promise for outcome improvement (Seid & Varni, 1999; Huth et al., 2004; Sutters et al., 2004, 2005). Future research related to pediatric T & A home recovery should include attention to design and method issues. These issues include: designing intervention studies with adequate power to find significant differences; reporting home recovery parameters specific to age, surgical procedure, and type of analgesia used; and using methods that facilitate data collection in the home environment. Statistical methods such as hierarchical linear modeling and instruments such as electronic diaries can be used to manage some of the difficulties of data collection in the home environment (Van Kuiken et al., 2007). Pain interventions must be designed to meet the unique postoperative concerns of family-centered pediatric T & A care in the home.

Researchers and health care providers need to collaborate to establish sound educational interventions that are designed to improve: assessment and decision-making related to pain and symptom management; recognition of the difference between analgesic side effects and postoperative complications; prevention of breakthrough pain; and application of non-pharmacological interventions. In light of parental beliefs about analgesics and continuing reports of unrelenting pain and symptom experiences during home care, research efforts must give attention to

the timing and method of delivery of family education. Developing innovative, evidence-based pain management interventions that use internet and web-based educational strategies may be more effective when they are delivered in the home environment (Kankkunen et al., 2004). Follow-up telephone calls have offered a reduction in clinic visits (Jones et al., 2007; Le et al., 2007) and could be designed to offer educational support.

It is clear that we have moved family home pain management following T & A beyond trial and error. A strong foundation of research has been

developed and can be used to build innovative interventions that will demonstrate the desired outcome of well-managed pain and symptoms during home recovery from T & A.

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References

- American Pain Society. The assessment and management of acute pain in infants, children, and adolescents: a position statement. 2006.
www.ampainsoc.org/advocacy/pediatric2.htm
- Chambers CT, Reid GJ, McGrath PJ, Finley, GA. A randomized trial of a pain education booklet: effects on parents' attitudes and postoperative pain management. *Child Health Care* 1997;26:1-13.
- Chambers CT, Reid GJ, McGrath PJ, Finley GA. Development and preliminary validation of a postoperative pain measure for parents. *Pain* 1996;68:307-313.
www.ncbi.nlm.nih.gov/pubmed/9121819
- Chang, KW. Randomized controlled trial of coblation versus electrocautery tonsillectomy. *Otolaryngol Head Neck Surg* 2005;132:273-280.
www.ncbi.nlm.nih.gov/pubmed/15692541
- Finley GA, Chambers CT, McGrath PJ, Walsh TM. Construct validity of the parents' postoperative pain measure. *Clin J Pain* 2003;19:329-334.
www.ncbi.nlm.nih.gov/pubmed/12966260
- Finley GA, McGrath PJ, Forward SP, McNeill G, Fitzgerald P. Parents' management of children's pain following 'minor' surgery. *Pain* 1996;64:83-87.
www.ncbi.nlm.nih.gov/pubmed/8867249
- Forward SP, Brown TL, McGrath PJ. Mothers' attitudes and behavior toward medicating children's pain. *Pain* 1996;67:469-474.
www.ncbi.nlm.nih.gov/pubmed/8951943
- Francis-Baldesari CD, O'Mathúna DP, Horwill L, Wiffen P. Analgesics for postoperative pain after tonsillectomy and adenoidectomy in children (Protocol). *Cochrane Database Syst Rev* 2007, Issue 3. DOI: 10.1002/14651858.CD006630.
<http://mrw.interscience.wiley.com/cochrane/clsystrev/articles/CD006630/frame.html>
- Gedaly-Duff V, Ziebarth D. Mothers' management of adenoid-tonsillectomy pain in 4- to 8-year olds: a preliminary study. *Pain* 1994;57:293-299.
www.ncbi.nlm.nih.gov/pubmed/7524009
- Hamers JP, Abu-Saad HH. Children's pain at home following (adeno) tonsillectomy. *Eur J Pain* 2002;6:213-219.
www.ncbi.nlm.nih.gov/pubmed/12036308
- Hamunen K, Kontinen V. Systematic review of analgesics given for pain following tonsillectomy in children. *Pain* 2005;117:40-50.
www.ncbi.nlm.nih.gov/pubmed/16109456
- Helgadóttir HL, Wilson ME. Temperament and pain in 3 to 7-year-old children undergoing tonsillectomy. *J Pediatr Nurs* 2004;19:204-213.
www.ncbi.nlm.nih.gov/pubmed/15185249
- Homer JJ, Swallow J, Semple P. Audit of pain management at home following tonsillectomy in children. *J Laryngol Otol* 2001;115:205-208.
www.ncbi.nlm.nih.gov/pubmed/11244527
- Hultcrantz E, Ericsson, E. Pediatric tonsillectomy with the radiofrequency technique: less morbidity and pain. *Laryngoscope* 2004;114:871-877.
www.ncbi.nlm.nih.gov/pubmed/15126747

Huth MM, Broome ME. A snapshot of children's postoperative tonsillectomy outcomes at home. *J Spec Pediatr Nurs* 2007;12:186-195.

www.ncbi.nlm.nih.gov/pubmed/17594298

Huth MM, Broome ME, Good M. Imagery reduces children's post-operative pain. *Pain* 2004;110:439-448.

www.ncbi.nlm.nih.gov/pubmed/15275797

Idvall E, Holm C, Runeson I. Pain experiences and non-pharmacological strategies for pain management after tonsillectomy: a qualitative interview study of children and parents. *J Child Health Care* 2005;9:196-207.

www.ncbi.nlm.nih.gov/pubmed/16076895

Jones DT, Yoon MJ, Licameli G. Effectiveness of postoperative follow-up telephone interviews for patients who underwent adenotonsillectomy: a retrospective study. *Arch Otolaryngol Head Neck Surg* 2007;133:1091-1095.

www.ncbi.nlm.nih.gov/pubmed/18025311

Kain ZN, Mayes LC, Caldwell-Andrews AA, Karas DE, McClain BC. Preoperative anxiety, postoperative pain, and behavioral recovery in young children undergoing surgery. *Pediatrics* 2006;118:651-658.

www.ncbi.nlm.nih.gov/pubmed/16882820

Kankkunen P, Pietilä A, Vehviläinen-Julkunen K. Families' and children's postoperative pain-literature review. *J Pediatr Nurs* 2004;19:133-139.

www.ncbi.nlm.nih.gov/pubmed/15077212

Kankkunen P, Vehviläinen-Julkunen K, Pietilä A, Halonen P. Parents' use of nonpharmacological methods to alleviate children's postoperative pain at home. *J Adv Nurs* 2003b;41:367-375.

www.ncbi.nlm.nih.gov/pubmed/12581102

Kankkunen P, Vehviläinen-Julkunen K, Pietilä A, Kokki H, Halonen P. Parents' perceptions and use of analgesics at home after children's day surgery. *Paediatr Anaesth* 2003a;13:132-140.

www.ncbi.nlm.nih.gov/pubmed/12562486

Le T, Drolet J, Parayno E, Rosmus C. Follow-up phone calls after pediatric ambulatory surgery for tonsillectomy: what can we learn from families? *J Perianesth Nurs* 2007;22:256-264.

www.ncbi.nlm.nih.gov/pubmed/17666296

Mitchell RB. Adenotonsillectomy for obstructive sleep apnea in children: outcome evaluated by pre-and postoperative polysomnography. *Laryngoscope* 2007;117:1844-1854.

www.ncbi.nlm.nih.gov/pubmed/17721406

McClain BC. Hospital-based pain care for infants and children. In: Finley GA, McGrath PJ, Chambers CT, editors. *Bringing pain relief to children: treatment approaches*. Totowa, NJ: Humana, 2006. pp. 1-30.

McEwen A, Moorthy C, Quantock C, Rose H, Kavanagh R. The effect of videotaped preoperative information on parental anxiety during anesthesia induction for elective pediatric procedures. *Paediatr Anaesth* 2007;17:534-539.

www.ncbi.nlm.nih.gov/pubmed/17498014

Rømsing J, Hertel S, Harder A, Rasmussen M. Examination of acetaminophen for outpatient management of postoperative pain in children. *Paediatr Anaesth* 1998;8:235-239.

www.ncbi.nlm.nih.gov/pubmed/9608969

Rømsing J, Østergaard D, Drozdiewicz D, Schultz P, Ravn G. Diclofenac or acetaminophen for analgesia in paediatric tonsillectomy outpatients. *Acta Anaesthesiol Scand* 2000;44:291-295.

www.ncbi.nlm.nih.gov/pubmed/10714842

Savedra MC, Tesler MD, Holzemer WL, Wilkie DJ, Ward JA. Pain location: validity and reliability of body outline markings by hospitalized children and adolescents. *Res Nurs Health* 1989;12:307-314.

www.ncbi.nlm.nih.gov/pubmed/2798951

Seid M, Varni JW. Pediatric day surgery outcomes management: the role of preoperative anxiety and a home pain management protocol. *J Clin Outcomes Manag* 1999;6:24-30.

Singer AJ, Gulla J, Thode HC Jr. Parents and practitioners are poor judges of young children's pain severity. *Acad Emerg Med* 2002;9:609-612.

www.ncbi.nlm.nih.gov/pubmed/12045074

Sutters KA, Miaskowski C. Inadequate pain management and associated morbidity in children at home after tonsillectomy. *J Pediatr Nurs* 1997;12:178-185. www.ncbi.nlm.nih.gov/pubmed/9198341

Sutters KA, Miaskowski C, Holdridge-Zeuner D, Waite S, Paul SM, Savedra MC, et al. A randomized clinical trial of the effectiveness of a scheduled oral analgesic dosing regimen for the management of postoperative pain in children following tonsillectomy. *Pain* 2004;110:49-55.

www.ncbi.nlm.nih.gov/pubmed/15275751

Sutters KA, Savedra MC, Miaskowski D, Holdridge-Zeuner D, Waite S, Paul SM, et al. Children's expectations of pain, perceptions of analgesic efficacy, and experiences with nonpharmacologic pain management strategies at home following tonsillectomy. *J Spec Pediatr Nurs* 2007;12:139-148.

www.ncbi.nlm.nih.gov/pubmed/17594294

Sutters KA, Miaskowski C, Holdridge-Zeuner D, Waite S, Paul SM, Savedra, MC, et al. Time-contingent dosing of an opioid analgesic after tonsillectomy does not increase moderate-to-severe side effects in children. *Pain Manag Nurs* 2005;6:49-57.

www.ncbi.nlm.nih.gov/pubmed/15970918

Van Cleve LJ, Savedra MC. Pain location: validity and reliability of body outline markings by 4 to 7-year-old children who are hospitalized. *Pediatr Nurs* 1993;19:217-220.

www.ncbi.nlm.nih.gov/pubmed/8511001

Van Kuiken DM, Li L, Huth MM. The difficulties of studying children's pain at home. *West J Nurs Res* 2007;29:432-447.

www.ncbi.nlm.nih.gov/pubmed/17538125

Warnock FF, Lander J. Pain progression, intensity and outcomes following tonsillectomy. *Pain* 1998;75:37-45.

www.ncbi.nlm.nih.gov/pubmed/9539672

Wei JL, Mayo MS, Smith HJ, Reese M, Weatherly RA. Improved behavior and sleep after adenotonsillectomy in children with sleep-disordered breathing. *Arch Otolaryngol Head Neck Surg* 2007;133:974-979.

www.ncbi.nlm.nih.gov/pubmed/17938319

Wiggins SA, Foster RL. Pain after tonsillectomy and adenoidectomy: "ouch it did hurt bad". *Pain Manag Nurs* 2007;8:156-165.

www.ncbi.nlm.nih.gov/pubmed/18036503