

# Allaying Anxiety in Children

## *When a Funny Thing Happens on the Way to the Operating Room*

IT was a dark and stormy on-call night when I first read the manuscript by Martin *et al.* that appears in this month's ANESTHESIOLOGY.<sup>1</sup> The groups from the Universities of California at Irvine and Los Angeles report on their validation of a "new intervention" that can be used by anesthesia practitioners to more effectively allay preoperative anxiety immediately before induction of general anesthesia in unpremedicated children. What is this "new intervention"? Is it a new sedative or hypnotic? An appearance by Kanye West or Beyoncé? An immobilus or impedimenta charm? No, it's ... a story! For the past two decades, Zeev Kain's group has been extensively studying patient risk factors and possible treatments for preoperative anxiety. Preoperative anxiety is important to prevent because it is correlated with adverse postoperative behavioral abnormalities. In this latest of their work, they have developed a method to teach healthcare providers and parents (or any adult that needs to allay anxiety in a child) the difference between "distress-promoting behaviors" and "coping-promoting behaviors." Distress-promoting behaviors include seemingly reassuring and well-meaning comments that are actually contrary to the child's perceptive reality. Coping-promoting behaviors include distraction techniques, such as humorous stories and "medical reinterpretation" (*e.g.*, pretending the anesthesia machine is a rocket ship). They call this educational intervention the Provider-Tailored Intervention for Perioperative Stress. This initial pilot study was not meant to test the intervention on the child but rather to see if anesthesiologists could be trained to use these coping-promoting behaviors. Who would have ever thought that an anesthesiologist could exert a positive influence on a child *without* drugs?

Once upon a time, in a land not so far away, it was common to anesthetize children without premedication, relying on one's charm and charisma to soothe the child



***“What is this ‘new intervention’? ... It’s a story!”***

before smothering their face with an anesthesia mask. Then, in 1959, Freeman and Bachman, from The Children's Hospital of Philadelphia, reported the use of premedication in children, using different combinations of intramuscularly administered sedatives.<sup>2</sup> But it was both the best of times and the worst of times: intramuscular administration ran contrary to the popular trend of children's hospitals becoming "ouchless" places. Premedication administered orally wasn't described until 1984.<sup>3</sup> In the 1990s, we began using the oral formulation of midazolam and soon discovered that remarkable euphoric state of inebriation and reliable amnesia that delights parents and perioperative personnel. Like propofol and the laryngeal mask, orally administered midazolam radically altered pediatric anesthesia practice.

Notwithstanding its objectionable aftertaste, oral midazolam premedication closely approaches the ideal premedication. It is easy to administer, has a predictably rapid onset and offset, does not increase oropharyngeal secretions, provides reliable anxiolysis and amnesia, and does not cause significant cardiovascular or respiratory depression in otherwise healthy children. Its possible prolongation of postoperative recovery in certain short-duration anesthetics is clinically inconsequential. So why look for something else?

For starters, oral midazolam isn't useful in all children. Anyone who has been in this business long enough knows that the bitter-tasting midazolam solution is spit out by a significant number of children. Other children are variously described as allergic to midazolam ("It makes my child dizzy") or hypersensitive if it caused a paradoxical reaction in the past. And some children just refuse to take it again if it once caused them to have a memorably un-

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Accepted for publication April 18, 2011. The author is not supported by, nor maintains any financial interest in, any commercial activity that may be associated with the topic of this article.

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◆ This Editorial View accompanies the following article: Martin SR, Chorney JM, Tan ET, Fortier MA, Blount RL, Wald SH, Shapiro NL, Strom SL, Patel S, Kain ZN: Changing healthcare providers' behavior during pediatric inductions with an empirically based intervention. ANESTHESIOLOGY 2011; 115:18-27.

pleasant experience. Moreover, in my younger and more vulnerable years, my senior attending physicians gave me some advice that I've been turning over in my mind ever since: the fewer drugs the better. But is it really possible to achieve a similar level of preinduction anxiolysis *without* drugs? Call me doubtful; however, I'm not ready to admit that a good story isn't often effective.

Anesthesiologists and other healthcare providers have been using distraction techniques for an immeasurably long period of time.<sup>4</sup> Distraction techniques come in a variety of forms. A humorous story or make-believe role playing are well known to relieve children of their anxiety or pain related to medical procedures. In the 1990s, Chris Abajian from the University of Vermont popularized the "magical premed."<sup>5</sup> He taught scores of anesthesiologists to do simple magic tricks that delighted anxious children and diverted their attention from the unpleasant reality of an anesthetic induction. These days, many children are able to play video games on a portable laptop computer or personal digital assistant during inhalational induction of general anesthesia.

One of the most important reasons to prevent preanesthetic emotional trauma is to prevent the accompanying postoperative behavioral abnormalities, a form of posttraumatic stress disorder. Long-lasting memories are most likely to be formed when there is a strong emotional attachment (*e.g.*, you remember your first kiss but not your twentieth). Distraction prevents the emotional component that accompanies a strongly unpleasant experience, such as a smothering anesthesia mask, and potentially may mitigate adverse postoperative changes.

In children, however, there are inherent problems with behavioral therapy related to its consistency and reliability. The most obvious is the necessarily broad range of methods based on the child's developmental age, temperament, and baseline personality. How any particular child will listen, interpret, and respond to incoming information is unpredictable. Thus, the Kain team's future research should more precisely define the anxiolytic narratives that are most effective for particular developmental age groups and those that can be adjusted depending on the personality of the child.

In certain older age groups, I foresee the development of computer-aided distraction techniques as most promising. Methods of providing a virtual reality experience have been successful for managing severe pain in pediatric patients.<sup>6</sup> By logical extension, these sophisticated experiences could be adapted to the preoperative environ-

ment.<sup>7</sup> Virtual reality goggles that display a three-dimensional interactive experience while the child is wheeled away from his/her parents is an enticing thought. A virtual reality technique ultimately may prove to be more cost effective and possibly more efficacious than programs such as Provider-Tailored Intervention for Perioperative Stress. But any purported behavioral intervention will need to be proven equally reliable to oral midazolam, our current gold standard.

In summary, Martin *et al.* have provided us with a promising study on the use of effective communication techniques that allay preanesthetic anxiety in children. It's a unique and fascinating look at alteration of anesthesiologist behavior that favorably alters outcomes in children. In fact, I have altered my own pediatric anesthesia practice since reading the manuscript. I now make every attempt to avoid distress-promoting behaviors and instead focus on coping-promoting behaviors. I make sure that as many children as possible get to sit in the cockpit of my rocket ship. They strap on the astronaut mask, and while a screaming comet comes across their sky, the sevoflurane works its own magic.

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## References

1. Martin SR, Chorney JM, Tan ET, Fortier MA, Blount RL, Wald SH, Shapiro NL, Strom SL, Patel S, Kain ZN: Changing healthcare providers' behavior during pediatric inductions with an empirically based intervention. *ANESTHESIOLOGY* 2011; 115: 18-27
2. Freeman A, Bachman L: Pediatric anesthesia: An evaluation of preoperative medication. *Anesth Analg* 1959; 38:429-37
3. Brzustowicz RM, Nelson DA, Betts EK, Rosenberry KR, Swedlow DB: Efficacy of oral premedication for pediatric outpatient surgery. *ANESTHESIOLOGY* 1984; 60:475-7
4. Ochsner KN, Gross JJ: The cognitive control of emotion. *Trends Cogn Sci* 2005; 9:242-9
5. Vagnoli L, Caprilli S, Robiglio A, Messeri A: Clown doctors as a treatment for preoperative anxiety in children: A randomized, prospective study. *Pediatrics* 2005; 116:e563-7
6. Hoffman HG, Chambers GT, Meyer WJ III, Arceneaux LL, Russell WJ, Seibel EJ, Richards TL, Sharar SR, Patterson DR: Virtual reality as an adjunctive non-pharmacologic analgesic for acute burn pain during medical procedures. *Ann Behav Med* 2011; 41:183-91
7. Dahlquist LM, Weiss KE, Law EF, Sil S, Herbert LJ, Horn SB, Wohlheiter K, Ackerman CS: Effects of videogame distraction and a virtual reality type head-mounted display helmet on cold pressor pain in young elementary school-aged children. *J Pediatr Psychol* 2010; 35:617-25