Concordance and Contrast Between Community-Based Physicians' and Dentist Anesthesiologists' History and Physicals in Outpatient Pediatric Dental Surgery

Sarat Thikkurissy, DDS, MS,* Megann Smiley, DMD, MS,† and Paul S. Casamassimo, DDS, MS‡

*Assistant Professor, Section of Pediatric Dentistry and †Clinical Assistant Professor, Section of Dental Anesthesiology, The Ohio State University, Columbus, Ohio and ‡Professor and Section Head, Pediatric Dentistry, The Ohio State University College of Dentistry, Columbus, Ohio

The objectives of this study were to compare history and physical examinations (H&Ps) done by community-based physicians and dentist anesthesiologists for children undergoing general anesthesia for dental rehabilitation. One hundred sixty-eight records were evaluated from the Nationwide Children's Hospital Dental Surgery Center of patients anesthetized between June 2006 and March 2007. These patients had H&Ps completed by both a community-based physician and a dentist anesthesiologist prior to general anesthesia. H&P forms were reviewed by the 3 authors to identify missing data, American Society of Anesthesiologists (ASA) classification, and impact on care. There was a statistically significant difference with respect to 10 of 17 sections examined, with the community-based physicians' H&Ps tending to be incomplete more often. Over 20% of community-based physicians made no mention of the history of present illness. One third of all physician H&Ps were missing vital sign recordings. No significant difference was noted between the physicians' and dentist anesthesiologists' ratings of ASA status. The physician H&P altered course of anesthesia treatment in <1% of studied cases. Statistically significant deficiencies were noted in the physician H&P in 60% of categories.

Key Words: Dentist anesthesiologist; General anesthesia; Outpatient surgery; History and physical.

The past decade has witnessed an increase in the number of ambulatory surgical centers performing medical and dental procedures under general anesthesia. According to the Joint Commission on Accreditation of Healthcare Organizations (JCAHO), there are approximately 5000 outpatient surgical centers in the United States, constituting slightly less than 50% of surgical centers nationwide.¹ These so-called day surgeries or surgicenters have become an option for procedures such as ophthalmic surgery and cosmetic, gynecologi-

cal, and dental care. These surgicenters tend to see healthier patients (American Society of Anesthesiologists [ASA] classification I/II) and have traditionally reported a low number of adverse outcomes. The overall morbidity associated with surgicenters is related to the nature of the procedure being performed and the patient's overall health history. The morbidity has been reported to be approximately 1% or less.² This same study reported an overall mortality of less than .002%. Morbidity for these patients was often associated with postoperative bleeding, poor pain control, allergic reactions, and cardiac dysrhythmias.

Ambulatory surgery centers have increasingly become a home to dental practitioners wishing to treat dental disease of children with challenging behavior.

Received September 28, 2007; accepted for publication February 8, 2008.

Address correspondence to Sarat Thikkurissy, DDS, MS, Section of Pediatric Dentistry, The Ohio State University College of Dentistry, 4126 Postle Hall, Columbus, OH 43218; thikkurissy.1@osu.edu.

Anesth Prog 55:35–39 2008

© 2008 by the American Dental Society of Anesthesiology

Table 1. Recommended Evaluations for Pediatric Patients Undergoing General Anesthesia

History
History of present illness
Past and current medical history
Medications
Known allergies
Previous anesthetic experiences
Family medical history
Ingestion of food or drink
Physical examination
Airway
Cardiovascular
Respiratory
Neurological
Hydration status

Eaton et al recently noted in a survey about 8 behavior management techniques that general anesthesia was the third most acceptable mode of treatment for parents, after tell-show-do and nitrous oxide use.³ This represents a considerable shift in acceptance from 1991, when a similar study found general anesthesia to be the least acceptable mode of treatment.⁴ This finding suggests that dentistry under general anesthesia has become a more commonplace occurrence.

With the increase in outpatient surgical procedures and their safety, traditional guidelines and recommendations for preoperative testing of pediatric patients have come under review. For example, a full laboratory hematological evaluation with differential was once considered the standard of care in preoperative assessment. However, studies note that preoperative laboratory studies are generally an unpleasant part of preparation for child and parent,⁵ and more importantly, less than 1% of abnormalities detected on preoperative screening have any impact on clinical management of patients.⁶ Preoperative screening seldom discloses new pathological findings of clinical relevance.⁷ Current recommendations are that laboratory testing is beneficial in infants less than 6 months old because of a high incidence of unrecognized anemia, or in children with pre-existing disease such as sickle cell anemia.⁸ Even more recently, nil per os (NPO) guidelines by the American Society of Anesthesiologists (ASA) were revised to be less restrictive, now allowing the consumption of clear fluids 2 hours prior to general anesthesia. History suggests that preoperative assessment has undergone and continues to undergo scrutiny as to the risks and benefits of procedures and protocols.

Current recommendations for history and physical evaluation (H&P) of pediatric patients undergoing

general anesthesia are noted in Table 1.⁹ In 2005, the American Academy of Pediatrics passed the *Basic Standards for Pre-Anesthesia Care*,¹⁰ in which the anesthesiologist was deemed responsible for (a) reviewing the medical record; (b) interviewing and performing a focused examination on the patient; (c) ordering and reviewing pertinent available tests and consultations necessary for delivery of anesthesia care, as well as preoperative medications; and (d) obtaining consent for the above procedures. The standards also state that “an anesthesiologist shall be responsible for determining the medical status of the patient.” These recommendations are in contrast with the 1996 statement that “primary health care providers should play a leading role in the medical evaluation and psychological preparation of children before surgery or other procedures requiring anesthesia.”⁹ A recent study by Burgoyne et al,¹¹ when surveying 400 members of the Society for Pediatric Anesthesia, noted a high degree of variability among respondents and concluded that assessment needs to “reflect patient status at the time of anesthesia, including any acute medical or surgical conditions.” The JCAHO has appointed departments or sections of anesthesia as the guardians of clinical standards for sedation and general anesthesia within hospitals.¹² The anesthesiologist is seen as the provider who must synthesize the health status, NPO status, and risk of adverse anesthetic reaction.

Experience and national data suggest that many children do not have regular medical visits or a regular physician in a medical home. As we look retrospectively at the evolution of outpatient surgery and the sequential elimination of routine preoperative urinalysis, blood testing, and chest radiographs, we can ask whether an H&P by a primary care provider physician is useful prior to outpatient surgery on a reportedly healthy child. Does an H&P performed by a primary care physician create needless logistic and financial hurdles for primary care providers and patient families, as well as possibly conflicting clinical findings? Can the dentist anesthesiologist's (DA's) H&P provide adequate safeguards?

This study compares physician-performed H&Ps with those completed by DAs for purposes of dental care of children under general anesthesia. It looks at agreement between physician and DA and assesses the presence of errors, including missing data and illegible entries, in procedures performed on a sample of children being treated for dental caries under general anesthesia provided by DAs in a tertiary care academic pediatric medical center.

Table 2. Summary Table of Results*

<i>Variable</i>	<i>MDHP, No. (%)</i>	<i>DAHP, No. (%)</i>	<i>P</i>
Use forms provided	151 (89.8)	168 (100)	
Chief complaint†	25 (14.8)	8 (4.8)	.005
Previous anesthetic†	28 (16.7)	6 (3.6)	<.001
Birth and neonatal history†	24 (14.3)	6 (3.6)	.001
Family medical history†	26 (15.4)	7 (4.2)	.002
History of present illness†	36 (21.4)	11 (6.5)	<.001
Past and current medical history†	16 (9.5)	1 (0.6)	.001
Medications†	15 (8.9)	2 (1.2)	.005
Known allergies†	12 (7.1)	1 (0.6)	.005
Physical examination—airway†	16 (9.5)	7 (4.2)	.092
Physical examination—cardiovascular†	18 (10.7)	2 (1.2)	.001
Physical examination—respiratory†	18 (10.7)	2 (1.2)	.001
Physical examination—oral†	10 (5.9)	6 (3.60)	.386
Vital signs†	56 (33.33)		
Legible	160 (95.2)		
H&P confirms ASA status	144 (85.82)	142 (84.5)	.751
Physician H&P alters course	1 (0.6)		

* MDHP indicates physician-generated history and physical evaluation; DAHP, dentist anesthesiologist's on-site history and physical evaluation.

† Data in this row refer to forms from which the information was missing.

METHODS

Background of Research Site

This Institutional Review Board–approved study was conducted at Nationwide Children's Hospital (NCH), Columbus, Ohio. A retrospective analysis was performed of charts of patients treated under general anesthesia from the Dental Surgery Center, an outpatient surgery center that provides an estimated 1600–2000 general anesthesia procedures per year. The Dental Surgery Center is staffed by 3 DAs.

Patients are initially identified in the dental clinic during new-patient, recall, or emergency visits. At this time, a dental clinic history form is completed by a parent or guardian and validated by parent interview by a dentist. In addition, a JCAHO-mandated drug list is completed. These are part of the dental record.

Once patients are identified and found in need of general anesthesia, they are required to have an H&P from their community pediatrician or family physician within 30 days of surgery, recorded on an NCH H&P form. The NCH H&P form required from physicians is a fill-in form requiring written notations. The DA also conducts an on-site H&P (DAHP) to note any changes to the physician-generated H&P (MDHP) on the day of service. Any pertinent lab tests and/or consults are also ordered by the DA prior to day of surgery, once the faxed or mailed MDHP has been received and reviewed well ahead of the day of service. The DA uses the dental clinic medical history originally provided by

the guardian and validated by the dentist at the initial dental examination to establish an ASA classification.

Sample

For this study, 308 charts were identified from patients of the Dental Surgery Center seen between June 2006 and March 2007. Charts were selected sequentially as a convenience sample and were required to have both MDHP and DAHP present, as well as the dental clinic medical history form.

Study Procedures

The Dental Surgery Center records with MDHP, DAHP, and dental clinic medical history were randomly assigned to 2 reviewers. Fifteen charts were reviewed by both reviewers and used to calibrate these 2 reviewers. These charts were included in the final sample. Records were compared with respect to the items listed in Table 2, which included common elements of the H&P forms, use of the appropriate NCH H&P form by physicians, and legibility and completeness of physician notations. Reviewers noted missing items, and these were tallied separately for the MDHP and the DAHP. Credit was given for shorthand notations such as "WNL" or "OK" that reviewers determined met the liberal criterion of that item having been addressed in some way. Blank spaces were considered missing data.

A third reviewer independently compared the ASA status from the MDHP with that of the DAHP, the latter being determined from the dental clinical medical history. It was also noted whether a finding on the MDHP altered the usual protocol for anesthesia or resulted in referral to an inpatient operating theater.

The 2-sample test of proportions for large samples was used to test the equality of the comparative values where possible.

RESULTS

Reviewers assessed 168 charts for the variables listed in Table 2. Approximately 100 (60%) of the patients were classified as ASA I based on their dental clinic health history. Sixty-six (39.5%) were classified as ASA II and the remaining 2 (1%) as ASA III.

Table 2 lists the variables tested and those found to be statistically significant ($P < .05$).

Overall, 151 (90%) of the physicians used the form provided by NCH. Table 2 lists the percentage of MDHPs and DAHPs missing data as a percentage of the 168 charts reviewed. Sixty-one MDHPs (36%) made no mention of the history of present illness or chief complaint that brought the patient to them. Statistically significant differences were noted between the MDHP and the DAHP for 10 areas (Table 2). The most striking differences were noted under the categories history of present illness (a margin of 25 records [14.9%] separating the MDHP and DAHP); previous anesthetic history (22 records [13.1%]); family history, including family anesthetic history (19 records [11.2%]); birth and neonatal history (18 records [10.7%]); and chief complaint (17 records [10%]).

One third of the MDHPs were missing vital signs requested on the NCH H&P form, and approximately 8 (4.8%) of the MDHPs were deemed to have some or all entries illegible. There was no significant difference with respect to ASA classification between the MDHP and the DAHP.

DISCUSSION

The purpose of our study was to compare the assessments made by physicians with those done by DAs prior to general anesthesia for pediatric dental care. Intuitively, a physician-generated H&P is seen as an asset, particularly for very young children with a still-evolving medical history. On the other hand, the nature of our patient population, which is largely low income and widely dispersed throughout the state in rural and depressed areas, makes obtaining timely

H&Ps difficult for many families. Further, these families often receive sporadic pediatric health care, and many do not have a medical home for their child. The requirement of a physician-generated H&P is an additional burden on these already financially-strapped families. Further, even for children with a medical home, the H&P requirement adds to the cost of care when it is done, and physicians may refuse to perform the procedure, claiming that it is a service for which they cannot bill. In our institution, the requirement for a physician-generated H&P places an undue burden on ancillary staff, who must spend time securing timely reports from community physicians. In some cases, the difficulty for our patients in obtaining an MDHP within the time constraints led to cancellation of surgery, prolonging the child's suffering and adding to overall burden of care. When considering efficiency of the surgery center, a cancelled case results in unutilized resources, idle staff, and lost opportunity for another child to have been treated. The MDHP also generates conflicting data that must be sorted out by the DA. These issues, and our observation that even well-done H&Ps often provide clinical data of limited value on our largely well-child patient pool, prompted us to do this study.

Our findings reinforce the JCAHO decision to have anesthesia sections be gatekeepers of diagnostic information pertinent to sedations and general anesthesia. This study demonstrated more thorough documentation in all 17 examined categories by the DAHP. This does not indict the community-based physician as a poor source of information; rather, it points out the natural limitations of a system that has high demand and low reimbursement. The MDHP often fails to be a reimbursable procedure, and costs are often absorbed by the medical provider.

More importantly, our study questions the utility of the physician-generated H&P. In only one case (0.6%) of all examined cases did the MDHP actually alter the course of anesthesia. In the one case, the MDHP recommended a sleep study prior to anesthesia to assess the patient for sleep apnea. In fact, the ASA assessment made by the DA from the initial dental history sufficed in the general anesthesia procedure.

Our findings suggest limited translational value of the MDHP's diagnostic information to clinical outcome. The suggestion of these findings is that the MDHP should be examined from a cost-benefit perspective. The requirement may place undue pressures on providers and families without a concomitant benefit. In our sample there was no perceived benefit of the MDHP over the DAHP.

CONCLUSIONS

1. The MDHP altered the course of anesthesia treatment in <1% of cases.
2. There was a statistically significant amount of missing material in the MDHP in 10 of 17 examined categories.
3. There was no significant difference between the MDHP and DAHP classifications of ASA status.

REFERENCES

1. Joint Commission on Accreditation of Healthcare Organizations. *2006 Comprehensive Accreditation Manual for Hospitals*. Oakbrook Terrace, Ill: JCAHO; 2006.
2. Fleisher L, Pasternak R, Lyles A. A novel index of elevated risk of inpatient hospital admission immediately following outpatient surgery. *Arch Surg*. 2007;142:263–268.
3. Eaton JJ, McTigue DJ, Fields HW Jr, Beck M. Attitudes of contemporary parents towards behavior management techniques used in pediatric dentistry. *Pediatr Dent*. 2005;27:107–113.
4. Lawrence S, McTigue DJ, Wilson S, Odom JG, Waggoner WF, Fields HW Jr. Parental attitudes toward behavior management techniques used in pediatric dentistry. *Pediatr Dent*. 1991;13:151–155.
5. Hollinger I. Current Trends in pediatric anesthesia. *Mt Sinai J Med*. 2002;69:51–54.
6. Turnbull JM, Buck C. The value of preoperative screening investigations in otherwise healthy individuals. *Arch Intern Med*. 1987;147:1101–1105.
7. Hesse S, Seebauer A, Schwender D. Ambulatory anesthesia: which preoperative screening tests are required. *Anaesthetist*. 1999;48:108–115.
8. Steward DJ. Screening tests before surgery in children. *Can J Anaesth*. 1991;38:693–695.
9. Means LJ, Ferrari LR, Fisher QA. Evaluation and preparation of pediatric patients undergoing anesthesia. *Pediatrics*. 1996;98:502–508.
10. American Academy of Pediatrics House of Delegates. *Basic Standards for Preanesthesia Care*. Approved 10-14-1987 and amended 10-25-2005.
11. Burgoyne L, Smeltzer M, Pereiras L, Norris A, DeArmeni A. How well do pediatric anesthesiologists agree when assigning ASA physical status classification to their patients? *Pediatr Anesth*. 2007;17:956–962.
12. Joint Commission on Accreditation of Healthcare Organizations. *Comprehensive Accreditation Manual for Hospitals*. Oakbrook Terrace, Ill: JCAHO; 1999.