Published in final edited form as:

Anesth Analg. 2011 April ; 112(4): 918–923. doi:10.1213/ANE.0b013e31820a9193.

Parental Recall of Anesthesia Information: Informing the Practice of Informed Consent

Alan R. Tait, Ph.D.,

Department of Anesthesiology, University of Michigan, Ann Arbor, MI

Terri Voepel-Lewis, M.S.N., R.N., and

Department of Anesthesiology, University of Michigan, Ann Arbor, MI

Virginia Gauger, M.D.

Department of Anesthesiology, University of Michigan, Ann Arbor, MI

Abstract

Background—Informed consent is a process of sharing information that facilitates the individual patient's right to self-determination. Despite its importance in anesthesia practice, the process of informed consent is rarely audited or examined. As such, there are only limited data with respect to anesthesia consent practices particularly within the pediatric setting. We designed this study, therefore, to examine the information that parents seek regarding their child's anesthesia, what they are told, who told them, and how much of the information they recall.

Methods—Parents of children undergoing a variety of elective surgical procedures were recruited while their child was in surgery. Parents were interviewed to determine their recall of their child's anesthetic plan, postoperative pain management, and attendant risks and benefits; and then surveyed regarding what information was sought and received, and how satisfied they were with the information.

Results—Two hundred sixty-three parents were included. Although the majority (96.2%) recalled receiving information about how their child's anesthesia would be administered, only 51.1% recalled being given information about the risks of anesthesia and 42.4% how side effects would be managed. Composite scores for parental recall of anesthesia information were generally poor (4.9 ± 2.5 out of 10). Furthermore, 50% and 55.7% of parents had no recall of the risks or benefits of anesthesia, respectively, and 82.9% could not recall pain medication side effects.

Corresponding Author: Alan R. Tait, Ph.D., University of Michigan, Dept. Anesthesiology, 1500 E. Medical Center Drive, Ann Arbor, MI 48109, Phone: 734-763-8128, FAX: 734-764-9332, atait@umich.edu, **Reprints will not be available from the authors.**

Publisher's Disclaimer: This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

The authors declare no conflicts of interest.

DISCLOSURES

Name: Alan R. Tait, Ph.D.

Contribution: This author helped design the study, conduct the study, analyze the data, and write the manuscript.

Attestation: Alan R. Tait has seen the original study data, reviewed the analysis of the data, approved the final manuscript, and is the author responsible for archiving the study files.

Terri Voepel-Lewis, M.S.N., R.N.

Contribution: This author helped design the study, conduct the study, analyze the data, and write the manuscript.

Attestation: Terri Voepel-Lewis has seen the original study data, reviewed the analysis of the data, and approved the final manuscript.

Virginia Gauger, M.D.

Contribution: This author helped conduct the study and write the manuscript.

Attestation: Virginia Gauger approved the final manuscript.

Recall of consent information obtained by anesthesia providers was significantly better than when obtained by surgical personnel ($P < 0.01$).

Conclusions—Results showed that disclosure of anesthesia information to parents was often incomplete, and their recall thereof, poor. The finding that recall of consent information provided by anesthesia providers was better than when provided by surgical personnel may serve to further the debate regarding the appropriate vehicles for anesthesia consent.

INTRODUCTION

Correctly executed, informed consent is a process that satisfies the bioethical principal of “respect for persons.”¹ More importantly, it serves to cement the doctor-patient relationship by promoting dialogue and the development of “a true partnership with shared-decision making authority and responsibility for outcomes.”² Unfortunately, these ideals often fall short due to a lack of meaningful dialogue, inadequate disclosure by the physician and a lack of understanding by the patient.^{2–7} The latter is particularly important given that a lack of understanding can lead to misinterpretation of the risks and benefits, treatment noncompliance, and decisional regret.^{8,9} In one study, Rosique et al. showed that 21% of patients undergoing anesthesia did not read the informed consent document before signing it and, of those who did, 64% had little or no recall of the information provided.⁵ In another study of information presented to parents about postoperative pain management, approximately one-third had no understanding of the risks of opioid pain medications.¹⁰

Although some institutions have moved towards anesthesia-specific consent forms, others use integrated surgical/anesthesia forms which are often administered by surgical providers who may lack the interest or expertise to provide detailed information about anesthetic options or risks and benefits.^{11,12} To our knowledge, there are limited data regarding parent recall of anesthesia information, particularly when provided by different personnel. This study was designed, therefore, to examine the information that parents seek regarding their child’s anesthesia, what they are told, who told them, and how much of the information they remember.

METHODS

This study was approved by the University of Michigan’s IRB with a waiver of documentation of consent. The study sample included parents of children (newborn – 18 years) who underwent general anesthesia for a variety of simple elective (e.g., myringotomy) and complex (e.g., spine fusion) procedures. In our setting, signed consent for anesthesia is obtained as part of the surgical consent process, either on the day of surgery or anytime within 6 months prior. This process, which typically includes some discussion and standardized written disclosure, may be conducted by a variety of surgical or anesthesia personnel. However, regardless of who obtains the signed consent, all parents review and discuss anesthesia-specific information with their child’s anesthesia care provider on the day of surgery. To ensure that parents had completed the preoperative discussion with their child’s anesthesia provider, they were approached in the waiting room after their child had gone to surgery.

Interview

After verbal agreement to take part in the study, the parent/guardian who signed the consent document was interviewed using a semistructured format to examine their recollection of their child’s anesthetic plan, the risks and benefits of anesthesia, pain management options, and the side effects associated with postoperative pain medications. Responses were

recorded *verbatim* by trained research assistants who were allowed to clarify questions and prompt for additional information but were unable to offer any specific details.

Transcribed responses were later reviewed independently by two assessors, blinded to who provided the information and compared with the child's perioperative care plan which was recorded while the child was in the postoperative recovery room. Scores of 0 (no recall), 1 (partial recall) and 2 (complete recall) were assigned for each of the following; knowledge of the anesthetic plan, the risks, the benefits, perioperative pain management, and the side effects of pain treatments. An overall recall score (range 0–10, where 10 = complete recall) was derived. Guidelines for scoring were determined *a priori* and were not overly restrictive. For example, parents were deemed to have “partial” recall if they could name at least one risk or side effect of anesthesia/analgesia and “complete” recall if they could name two or more. The scoring system used was based on the Deaconess Informed Consent Comprehension Test and has been described previously.^{6,13,14} Parents also rated their perceived overall understanding of the material scored on a 1–10 numbers scale, where 10 = complete understanding.

Questionnaire

Next, parents completed a questionnaire to elicit what information they had sought and received regarding their child's anesthesia. Before implementation, items in the questionnaire were shown to a small sample of parents and anesthesia providers for an informal assessment of face and content validity, respectively. Items in the questionnaire were based on our previous work,^{14,15} or adapted from other studies.^{16,17}

The final questionnaire was divided into several subsections as follows:

1. “Information Sought and Received”

These items addressed whether parents had sought and/or received information regarding anesthesia before their child's surgery. Sources such as the Internet or other media were explored. This section also asked about specific questions that parents had about their child's anesthesia and whether the risks and benefits of anesthesia had been discussed when the consent was signed. Details of the information provided on the day of surgery were examined including the parents' perceptions of the clarity and amount of information, and their satisfaction with the information provided.

2. “Communication Style”

Several items addressed the degree to which the anesthesia provider interacted with the parent(s) during the preoperative assessment, whether the provider listened to concerns, answered questions, and assessed understanding of the information. Responses were measured using a 5-point scale of “strongly agree” to “strongly disagree.”

3. “Future Information”

Parents were asked how they would prefer to receive information about anesthesia care (e.g., written vs. verbal) and when they would prefer to receive it (e.g., day of surgery vs. several days prior, etc.). Parents were also asked to rate the importance of information about anesthesia relative to surgery.

4. “Demographics”

This section elicited information regarding the age of the child and parent, family race/ethnicity, level of education, family income, and whether the child had undergone a prior anesthetic.

Statistical Analysis

Statistical analyses were performed using PASW software (PASW Inc., v 18.0, Chicago, IL). Descriptive data were analyzed using frequency distributions. Categorical variables were analyzed by chi-square and Fisher's Exact test, as appropriate. Inter-rater agreement between assessors was performed using the kappa (κ) statistic. Kappa values of ≥ 0.7 were considered to represent good levels of agreement. Data are presented as mean $\pm$ SD and n (%). Statistical significance was accepted as $P < 0.05$ unless Bonferroni-corrected for multiple comparisons.

In determining sample size, we estimated that approximately 13,000 children undergo anesthesia at our institution per year. Using standard survey methodology, we determined that a sample size of 261 would provide a representative sample of the target population with a 95% confidence level and a margin of error of $\pm 6\%$.

RESULTS

A total of 296 parents were approached to participate in this study. Of these, 30 declined to participate and 3 did not complete all the research elements due to being called to the recovery area earlier than expected. Data are thus described for 263 parents.

Information sought and received

Table 1 describes the demographics of the sample population. One hundred forty-four parents (54.8%) reported that they had received some information about anesthesia before the day of surgery. Additionally, 35 (13.4%) parents sought anesthesia information on their own before surgery, 23 (8.7%) of whom used the Internet. The primary Internet sites accessed included, Google (7.6%), the University of Michigan's Anesthesiology website (4.9%), and the Society for Pediatric Anesthesia website (1.5%).

Eighty (30.4%) parents reported that they had no specific questions about anesthesia before surgery; however, others wanted information about: how the anesthetic would be given (32.3%), pain management (32.3%), "how long my child would take to wake up" (36.1%), "when I can see my child after surgery" (38.4%), and intraoperative awareness (3.4%). Furthermore, although parents ranked the importance of being told about the risks of anesthesia as 9.03 ± 1.7 of 10 (where 10 = high), only 67 (25.5%) actually had questions about risks. The majority of signed consents were obtained by surgical personnel (Table 2). When asked if the consent document had contained any information about anesthesia, 28 (11%) parents reported that it "had not" and 118 (45.7%) "could not remember." The majority of parents (83.9%) believed that anesthesia information was equally as important as surgical information, 30 (11.5%) believed it "less important," while 12 (4.6%) thought it "more important." Just over half of the parents reported receiving information during the preoperative assessment about anesthetic risks and how they would be managed (Table 3). Of those receiving specific risk information, 35 (53.0%) parents reported that knowing the risks had no effect on their anxiety, 26 (39.4%) reported feeling "less anxious," and 5 (7.6%), "more anxious." These results were not significantly different from parents who were not given risk information (68.0%, 25.8%, and 6.2%, respectively). The majority (42.7%) of providers spent between 5 and 10 minutes with parents during the preoperative assessment and in half of the cases (53.6%) they also spoke to the child about their anesthetic. Eighty-eight percent of parents were "satisfied/extremely satisfied" with the time taken by the anesthesia provider for discussion and 95.0%, 96.5%, 96.1% were "satisfied/extremely satisfied" with the anesthesia providers explanations ("in words I understood"), willingness to answer questions, and friendliness/courtesy, respectively. Only 12 (4.6%) parents were dissatisfied with the information provided, 2 (0.8%) felt that the information

was unclear, 48 (18.4%) believed that there was “too little” information, and 2 (0.8%) felt there was “too much.” Table 4 describes parents’ preferences for the receipt of anesthesia information. As shown, parents would prefer to receive information about anesthesia closer to the day of surgery.

Recall

Measures of inter-rater reliability for scores of understanding between the two assessors revealed excellent measures of exact agreement (Kappa = 0.85–0.97 for the elements). Composite scores based on the observers’ measures of parental recall were relatively poor (4.9 ± 2.5 of 10), contrasting sharply with the parents’ self-perceived level of understanding (8.30 ± 1.7 , $P = 0.003$). As shown in Table 5, parents had particularly poor recall of the anesthetic risks and benefits and the side effects of postoperative pain medications. The effects of different characteristics on parents’ recall are described in Table 6. These data show that informed consent obtained by anesthesia providers and on the day of surgery resulted in significantly better recall. However, to obviate the effect of the timing of consent by different providers, we stratified the data and showed that regardless of when signed consent was obtained, recall of information was better when signed consent was obtained by anesthesia providers compared with surgical providers, i.e., ≥ 1 week before surgery; 8.00 ± 1.4 vs 4.33 ± 2.2 , and within 1 week before surgery; 7.79 ± 2.7 vs 4.9 ± 2.3 , $P < 0.05$, respectively.

There were no statistical differences in understanding by race/ethnicity (Caucasian, 5.02 ± 2.5 vs African American, 4.06 ± 2.4 vs Hispanic, 5.50 ± 2.9); English as a first language (“yes,” 4.94 ± 2.5 vs “no,” 4.61 ± 2.7), child’s prior anesthetic (“yes,” 4.93 ± 2.6 vs “no,” 4.87 ± 2.2), clarity of information (“not clear,” 3.0 ± 2.8 vs “very clear,” 5.1 ± 2.4) and anxiety from receiving the anesthesia information (“less anxious,” 4.97 ± 2.1 vs “more anxious,” 4.75 ± 2.7). However, parents who had more than a 12th grade education had greater recall than those who did not finish high school (4.99 ± 2.5 vs 3.42 ± 1.7 , $P < 0.001$) and those who were satisfied with the information they received had greater overall recall than patients who were dissatisfied (5.02 ± 2.4 vs 3.17 ± 2.2 , $P = 0.009$).

DISCUSSION

A signature on an informed consent document neither implies that consent has taken place nor protects the physician against malpractice. Instead, informed consent is a *process* and while the consent document may provide important information, it is no substitute for the informed discussion that must occur between the physician and the parent/patient.^{2,18} In many institutions (including ours), the consent document for anesthesia is incorporated into the surgical consent form and, as such, signed consent is often obtained several weeks before surgery by surgical providers who may lack the appropriate training to provide detailed information about anesthesia.^{11,12} Regardless of when or by whom the consent signatures are obtained, anesthesia providers are required to meet with the parent on the day of surgery in order to discuss the anesthetic plan and to complete the consent process. Despite this, many anesthesiologists report challenges in obtaining consent including uncertainty regarding the type and amount of information that the patient requires.¹⁹ Indeed, in our study, only one-third of parents recalled being told about the different anesthetic options (when an option was available) and only half were told about the risks and benefits. These results are similar to data from other areas of medicine,^{20–23} suggesting a general difficulty of many patients to recall or understand medical information. While an absence of recall does not necessarily imply an absence of informed consent, recall partially depends on comprehension²⁴ and may have implications for parental care of the child postoperatively. Furthermore, it may be harder to argue that consent is truly “informed” if relevant information is not disclosed or discussed. Of relevance to the practice of anesthesia was the

finding that parental recall was better when signed consent was obtained by an anesthesia rather than surgical provider and suggests that regardless of when consent is obtained, something about the process is different when the consent document is presented by an anesthesia care provider. Although this was not a randomized study, these data suggest that anesthesia-specific information and consent is more complete when provided and obtained by anesthesia providers, respectively.

Although several studies have documented parents' and patients' desires for anesthesia-risk information,^{25–28} detailed discussions about the risks may be omitted or de-emphasized due to concern that providing risk information will unduly worry the patient. In our study, the majority of parents were either not affected or felt less anxious after receiving risk information, while only 7.6% reported feeling more anxious. Other studies confirm these findings suggesting that, in general, informing the patient about the risks of surgery and anesthesia does not increase anxiety and may actually alleviate it.^{29,30} Indeed, evidence suggests that patients who are likely to become anxious still want to receive anesthesia risk information.³¹

Previously, we identified several predictors of parental recall of anesthesia research consent⁶ including higher education level, clarity of the disclosure, and the degree to which parents listen to the researcher and read the consent document. In the present study, higher education was also associated with improved recall and underscores the difficulties that many less educated individuals have comprehending medical information. Part of the reason for this is that consent documents are typically written at an above 8th grade reading level and that health care providers frequently use terminology that is difficult for the layperson to interpret. Indeed, several studies have shown that parents with lower literacy and numeracy (quantitative literacy) abilities have difficulty understanding basic medical information and, in particular, that involving risk/benefit statistics.^{6,8} Although several strategies to improve parents' and patients' understanding of medical information, including the use of anesthesia information leaflets,^{24–32} video presentations,^{33–36} and computer-based interactive consents³⁷ have shown promise, further studies may be necessary.

Results suggested that the majority of parents were satisfied with the information they received, despite the fact that many of them could not remember it. This observation is consistent with previous work which shows that individuals are usually happy with the information they receive, unless provided with alternatives.^{14–38} For example, Garden et al.³⁸ showed that an equal number of patients randomized to one of three informational leaflets with different amounts of information (minimal, standard, full) perceived the amount of information to be “just right.” However, when all three leaflets were presented together, two-thirds of patients deemed the information in the “minimal” group to be insufficient. This suggests that satisfaction with information provided may be a poor surrogate for the quality of consent.

An important finding was that the majority of parents desired information about anesthesia within the week of surgery, and nearly one-third wanted this information on the day of surgery. Additionally, this information was better recalled when given nearer the time of surgery. These findings suggest that in order to facilitate parent/patient-relevant, comprehensive, and informed consent, the entire process should take place closer to the time of surgery.

A few points regarding the limitations of this study are warranted. First, this is a nonrandomized study and as such may be subject to selection bias. However, since subjects were recruited consecutively as they presented at surgery, we believe that the potential for bias was low. Furthermore, the survey component may be subject to the potential for biases

associated with nonresponse, self-report, and recall. In this study, the level of bias was likely low since the response rate was high (reducing nonresponse), the questionnaires were completed anonymously (reducing self-report) and, furthermore, were completed shortly after anesthesia information had been given (reducing recall bias). Importantly, we should note that while we measured parents' recall of information, we did not witness the actual physician-parent interactions and, thus, were unable to examine the degree to which recall/understanding affected decision-making. We should also note that this study reflects the consent practices of a single hospital and, as such, may not be generalizable to all institutions. Lastly, although the sample was sufficiently large to be representative of the pediatric surgical population at our institution, we recognize that there may have been insufficient power for some of the analyses.

The results of this descriptive study suggest that anesthesia information is better recalled when informed consent is obtained on the day of surgery and by an anesthesia care provider. These data, therefore, may serve to further the debate regarding the suitability of nonanesthesia personnel to provide comprehensive anesthesia information and obtain informed consent. These results also showed that regardless of who obtained consent, disclosure was often incomplete and recall poor, particularly among parents with lower education. From a legal perspective, it is important to ensure that the information provided satisfies the appropriate state-specific standards e.g., the Reasonable Person standard but, more importantly, from an ethical perspective that it satisfies the parents' or patients' needs and fulfills the bioethical principle of "respect for persons" and informed consent. Further work to develop strategies to improve the disclosure and understanding of consent information for anesthesia may, therefore, be warranted.

Acknowledgments

The authors are indebted to Jennifer Hemberg B.S., Lauren Perlin B.S., Elsa Pechlivanidis, Bianca Lawrence and Katherine Lypen for help with subject recruitment and data collection.

Funding: This study was supported in part by grant R01HD053594 from the National Institutes of Health (NICHD), Bethesda MD (to Dr. Tait).

REFERENCES

1. Beauchamp, T.; Childress, J. Principles of biomedical ethics. New York: Oxford University Press; 1994.
2. Paterick T, GV C, Allen M, Paterick T. Medical informed consent: general considerations for physicians. Mayo Clin Proc. 2008; 83:313–319. [PubMed: 18315998]
3. Olson D, Windish D. Communication discrepancies between physicians and hospitalized patients. Arch Intern Med. 2010; 170:1302–1307. [PubMed: 20696951]
4. Cassileth BR, Zupkis RV, Sutton-Smith K, March V. Informed consent -- why are its goals imperfectly realized? N Engl J Med. 1980; 302:896–900. [PubMed: 7360175]
5. Rosique I, Perez-Carceles M, Romero-Martin M, Osuna E, Luna A. The use and usefulness of information for patients undergoing anesthesia. Med Law. 2006; 25:715–727. [PubMed: 17263037]
6. Tait AR, Voepel-Lewis T, Malviya S. Do they understand? (Part I): Parental consent for children participating in clinical anesthesia and surgery research. Anesthesiology. 2003; 98:603–608. [PubMed: 12606901]
7. Van Stuijvenberg M, Suur M, De Vos S, Tjiang G, Steyerberg E, Derksen-Lubsen G, Moll H. Informed consent, parental awareness, and reasons for participating in a randomised controlled study. Arch Dis Child. 1998; 79:120–125. [PubMed: 9797591]
8. Stryker J, Wray R, Emmons K, Winer E, Demetri G. Understanding the decisions of cancer clinical trial participants to enter research studies: Factors associated with informed consent, patient satisfaction, and decisional regret. Patient Educ & Counsel. 2005; 63:104–109.

9. Tait AR, Voepel-Lewis T, Malviya S. Factors that influence parents' assessments of the risks and benefits of research involving their children. *Pediatrics*. 2004; 113:727–732. [PubMed: 15060219]
10. Tait AR, Voepel-Lewis T, Snyder R, Malviya S. Parents' understanding of information regarding their child's postoperative pain management. *Clin J Pain*. 2008; 24:572–577. [PubMed: 18716495]
11. Marco A. Informed consent for surgical anesthesia care: Has the time come for separate consents. *Anesth Analg*. 2010; 110:280–282. [PubMed: 20081122]
12. Marcucci C, Seagull E, Loreck D, Bourke D, Sandson N. Capacity to give surgical consent does not imply capacity to give anesthesia consent: Implications for anesthesiologists. *Anes Analg*. 2010; 110:596–600.
13. Miller C, O'Donnell D, Searight H, Barbarash R. The Deaconess Informed Consent Comprehension Test: an assessment tool for clinical research subjects. *Pharmacotherapy*. 1996; 16:872–878. [PubMed: 8888082]
14. Tait AR, Voepel-Lewis T, Malviya S, Philipson S. Improving the readability and processability of a pediatric informed consent document: effects on parents' understanding. *Arch Pediatr Adolesc Med*. 2005; 159:347–352. [PubMed: 15809387]
15. Tait AR, Voepel-Lewis T, Zikmund-Fisher B, Fagerlin A. The effect of format on parents' understanding of the risks and benefits of clinical research: A comparison between text, tables, and graphics. *J Hlth Comm*. 2010:In Press.
16. Engel K, Heisler M, Smith D, Robinson C, Forman J, Ubel P. Patient comprehension of emergency department care and instructions: Are patients aware of when they do not understand? *Ann Emerg Med*. 2009; 53:454–461. [PubMed: 18619710]
17. Smith L, Callery P. Children's accounts of their preoperative information needs. *J Clin Nurs*. 2005; 14:230–238. [PubMed: 15669932]
18. English D. Valid informed consent: A process not a signature. *Am Surgeon*. 2002; 68:45–48. [PubMed: 12467316]
19. Waisel D, Lamiani G, Sandrock N, Pascucci R, Truog R, Meyer E. Anesthesiology trainees face ethical, practical, and relational challenges in obtaining informed consent. *Anesthesiology*. 2009; 110:480–486. [PubMed: 19225393]
20. Nadeau D, Rich J, Brietzke S. Informed consent in pediatric surgery: Do parents understand the risks? *Arch Otolaryngol Head Neck Surg*. 2010; 136:265–269. [PubMed: 20231645]
21. Elfant AB, Korn C, Mendez L, Pello MJ, Peikin SR. Recall of informed consent after endoscopic procedures. *Dis Colon Rectum*. 1995; 38:1–3. [PubMed: 7813335]
22. Turner P, Williams C. Informed consent; patients listen and read, but what information do they retain? *NZMJ*. 2002; 115
23. Steven M, Broadis E, Carachi R, Brindley N. Sign on the dotted line: parental consent. *Pediatr Surg Int*. 2008; 24:847–849. [PubMed: 18506452]
24. Langdon I, Hardin R, Learmonth I. Informed consent for total hip arthroplasty: does a written information sheet improve recall by patients. *Ann R Coll Surg Engl*. 2002; 84:404–408. [PubMed: 12484580]
25. Franck L, Spencer C. Informing parents about anaesthesia for children's surgery: a critical literature review. *Patient Educ and Counsel*. 2005; 59:117–125.
26. Litman R, Perkins F, Dawson F. Parental knowledge and attitudes towards discussing the risk of death from anesthesia. *Anesth Analg*. 1993; 77:256–260. [PubMed: 8346823]
27. Waisel D, Truog R. The benefits of the explanation of the risks of anesthesia in the day surgery patient. *J Clin Anesth*. 1995; 7:200–204. [PubMed: 7669309]
28. Fortier M, Chorney J, Rony R, Perret-Karimi D, Rinehart J, Camilon F, Kain Z. Children's Desire for perioperative information. *Anesth Analg*. 2009; 109:1085–1090. [PubMed: 19762736]
29. Inglis S, Farnill D. The effects of providing preoperative statistical anaesthetic-risk information. *Anaesth Intens Care*. 1993; 21:799–805.
30. Ivarsson B, Larsson S, Luhrs C, Sjoberg T. Extended written preoperative information about possible complications at cardiac surgery - do the patients want to know? *Eur J Cardio-Thor Surg*. 2005; 28:407–414.
31. Dawes P. Informed consent: what do patients want to know? *J Royal Soc Med*. 1994; 87:149–152.

32. Spencer C, Franck L. Giving parents written information about children's anesthesia: Are setting and timing important? *Pediatr Anesth*. 2005; 15:547–553.
33. Bellew M, Atkinson K, Dixon G, A Y. The introduction of a paediatric anaesthesia information leaflet: an audit of its impact on parental anxiety and satisfaction. *Paediatr Anaesth*. 2002; 12:124–130. [PubMed: 11882223]
34. Cassady J, Wysocki T, Miller K, Cancel D, Izenberg N. Use of a preanesthetic video for facilitation of parental education and anxiolysis before pediatric ambulatory surgery. *Anesth Analg*. 1999; 88:246–250. [PubMed: 9972735]
35. Kain Z, Wang S, Caramico L, Hofstadter M, Mayes L. Parental desire for perioperative information and informed consent: A two-phased study. *Anesth Analg*. 1997; 84:299–306. [PubMed: 9024018]
36. Karl H, Pauza K, Heyneman N, Tinker D. Preanesthetic preparation of pediatric outpatients: The role of a videotape for parents. *J Clin Anesth*. 1990; 2:172–177. [PubMed: 1693853]
37. Tait AR, Voepel-Lewis T, Moscucci M, Brennan-Martinez C, Levine R. Patient comprehension of an interactive, computer-based information program for cardiac catheterization. *Arch Intern Med*. 2009; 169:1907–1914. [PubMed: 19901144]
38. Garden A, Merry A, Holland R, Petrie K. Anaesthesia information-what parents want to know. *Anaes Intens Care*. 1996; 119:594–598.

Table 1**Demographics**

	N = 263
Parent age, years	37.0 ± 8.3
<i>Race/ethnicity:</i>	
Caucasian	209 (82.0)
African American	18 (7.1)
Hispanic	6 (2.4)
Other	22 (8.5)
<i>Education:</i>	
< 12th grade	13 (5.1)
High School	42 (16.5)
Some College	74 (29.0)
College Graduate	82 (32.2)
Graduate School	44 (17.3)
<i>Previous surgery:</i>	
Parent	163 (65.5)
Child	169 (67.9)
English as first language	237 (94.4)

Data are presented as n (%) and mean ± SD

Table 2

Characteristics of the Informed Consent Process

	n (%)
<i>Personnel obtaining signed informed consent:</i>	
Anesthesiologist	6 (2.9)
Certified registered nurse anesthetist	19 (9.1)
Surgeon	95 (45.6)
Clinic Nurse	59 (28.4)
Nurse Practitioner	12 (5.8)
Physician's Assistant	13 (6.3)
Other	4 (1.9)
<i>Timing of when consent was signed:</i>	
Day of surgery	72 (32.4)
1 – 6 days before surgery	32 (14.4)
1 week – 1 month prior	59 (26.6)
1 – 3 months prior	49 (22.1)
3 – 6 months prior	10 (4.5)

Table 3

Information Provided During the Preoperative Assessment by Anesthesia Providers (%)

	“Yes”	“No”	“Can’t Remember”
How anesthesia would be given	96.2	2.7	1.1
Different anesthetic options	36.0	58.5	5.4
Risks of anesthesia	51.1	40.8	8.0
Benefits of Anesthesia	52.1	38.8	9.1
Postoperative pain management	81.2	15.3	3.4
How side effects would be managed	42.4	42.7	14.9

Table 4

Parents Preferred Format and Timing for Receiving Anesthesia Information

	Answered "Yes" n (%)
Prefer not to know	1 (0.4)
Verbal information from a doctor or nurse only	135 (51.5)
Written information only	17 (6.5)
Verbal and written information	152 (58.0)
Video/DVD	7 (2.7)
Website	29 (11.1)
<i>Information timing preferences:</i>	
Don't care	15 (6.1)
≥ week before surgery	69 (28.2)
Within a week before surgery	82 (33.5)
Day of surgery	79 (32.2)

Table 5

Parents' Understanding of Anesthesia Information

	None	Partial	Complete
Anesthesia plan	20 (7.6)	121 (46.2)	121 (46.2)
Anesthesia risks	126 (50.0)	98 (38.9)	28 (11.1)
Anesthesia benefits	142 (55.7)	85 (33.3)	28 (11.0)
Pain management	36 (15.2)	101 (42.4)	101 (42.4)
Side effects of pain treatment	161 (82.9)	25 (12.9)	8 (4.2)

Data are presented as n (%)

Table 6**Parents' Recall of Information by Characteristics of the Consent Process**

	Overall Recall
<i>Personnel obtaining signed consent:</i>	
Anesthesiology resident (R)	9.17 ± 1.6
CRNA (R2)	7.25 ± 2.7
Surgical attending	4.82 ± 2.3 ^{*†}
Surgical resident	4.46 ± 2.3 ^{*†}
Nurse Practitioner	4.81 ± 2.1 ^{*†}
Surgery Clinic Nurse	4.56 ± 2.3 ^{*†}
Physician's Assistant	3.73 ± 1.6 ^{*†}
<i>Timing of when consent was signed:</i>	
Day of Surgery (R)	6.03 ± 2.9
< 1 week before surgery	4.71 ± 1.7 [*]
1 week – 1 month prior	4.49 ± 2.1 [*]
1 – 3 months prior	4.37 ± 2.4 [*]
3 – 6 months prior	3.11 ± 1.5 [*]

Data are presented as mean ± SD, based on a 0–10 scale where 10 = complete recall

R = Reference, CRNA = Certified Nurse Anesthetist

^{*} P ≤ 0.001 vs Reference,

[†] P ≤ 0.001 vs Reference 2