Published in final edited form as:

Paediatr Anaesth. 2009 April ; 19(4): 376–384. doi:10.1111/j.1460-9592.2008.02921.x.

Healthcare provider–child–parent communication in the preoperative surgical setting

ZEEV N. KAIN, MD MBA^{*,†}, JILL E. MACLAREN, PhD[‡], CARRIE HAMMELL, BA[§], CRISTINA NOVOA, BA[§], MICHELLE A. FORTIER, PhD^{¶, **}, HEATHER HUSZTI, PhD^{**}, and LINDA MAYES, MD^{††}

^{*}Department of Anesthesiology and Perioperative Care, Pediatrics & Psychiatry, University of California, Irvine, CA, USA

[†]Department of Pediatrics, Children's Hospital of Orange County, Orange, CA, USA

[‡]Department of Anesthesiology and Perioperative Care, University of California, Irvine, CA, USA

[§]Department of Anesthesiology, Yale University School of Medicine, New Haven, CT, USA

[¶]Department of Anesthesiology and Perioperative Care, University of California, Irvine, CA, USA

^{**}Pediatric Psychology, Children's Hospital of Orange County, Orange, CA, USA

^{††}Department of Child Psychiatry, Psychology and Pediatrics, Yale University School of Medicine, New Haven, CT, USA

Summary

Objectives: Although preoperative preparation programs were once common, most children currently undergoing outpatient surgery are first exposed to the hospital on the day of the procedure. It is advocated that these outpatient children undergo the preparation just prior to surgery.

Aim: To assess the amount of time that healthcare providers spend with children and families on the day of surgery in the preoperative area.

Materials and Methods: The study used video infrastructure in the preoperative holding area of Yale New Haven Children's Hospital to record all interactions between children, families, and healthcare providers. Videotapes were coded to characterize and quantify behaviors of healthcare professionals.

Results: On the day of surgery, healthcare providers spent medians of 2.75–4.81 min interacting with children and parents in the preoperative area. Families spent a median of 46.5 min in the preoperative area. Healthcare professionals spent the most time in medical talk (averages of 42.5–48.2% of time spent with family) and little time was spent in nonmedical talk (range of 6.2–6.9% of time spent with family). Anesthesiologists and surgeons spent 28% and 18% of the interview in talk to children; admitting nurses spent more of the interview talking to children (43%).

Conclusions: Families interact with healthcare providers for only a small proportion of the time they spent in the preoperative area. This is likely to be a result of increased production pressure in the perioperative settings and has implications for providing preparation for surgery on the morning of the procedure.

Keywords

children; surgery; communication; preoperative preparation; anesthesia

Introduction

Preoperative preparation was previously a common practice that offered families an opportunity to learn about the surgery process and build rapport with the healthcare providers. Although these programs were originally developed for children undergoing prolonged hospitalization, preparation for outpatient surgery has been shown to effectively reduce children's anxiety and improve postoperative outcomes (1). Unfortunately, the availability of these hospital-based preoperative preparation programs is on the decline. A recent survey indicated that most of these programs have been eliminated due to a lack of funding and currently about 80% of all children undergoing outpatient surgery in the US never visit the hospital prior to the day of surgery (2).

A common rationale provided for this change in policy is that children and parents will be adequately prepared on the morning of surgery. Unfortunately, increased production pressures in hospitals may hinder this approach. With operating rooms providing up to 40% of all hospital revenue, health-care providers have less time to spend with each patient on the day of surgery.

In the brief interaction that now occurs just prior to surgery, healthcare professionals must balance providing and eliciting necessary medical information with rapport building, thus drawing on complex communication skills. Evidence for the importance of effective communication comes from the primary care literature where information gathering, clinical questioning, patient centeredness, and information giving have been found to be most important during patient consultation (3). Specifically, behaviors such as greetings, casual conversation, asking medical questions and offering medical information, as well as behaviors such as smiles, nods, eye contact, and backchannel responses (short verbal and/or nonverbal indications that the listener is attentive) have been found to reflect quality communication (4).

Although there is a fair amount of literature examining healthcare provider communication in primary care, to date no study has examined this issue in pediatric preoperative settings. The current study is aimed at documenting the amount of time healthcare providers actually spend with families prior to surgery in the perioperative area. In addition, a goal of this study is to explore the nature of communication between healthcare providers and families.

Materials and methods

This study was conducted in an outpatient surgery center of a tertiary care medical center. Families of children age 2–10 years old with American Society of Anesthesiologists Physical Status I and II who were scheduled to undergo elective outpatient surgery under general anesthesia and their parents were considered for enrolment in this study. No children recruited for this study underwent any form of hospital-based preoperative preparation prior to the surgery day and none of the children or parents had ever interacted with the anesthesiologist or nurse prior to the day of surgery. Further, no education was done over the telephone prior to the day of surgery. Children and parents may have interacted with the surgeon at an office visit, i.e. some children were managed by residents and thus never met the operative surgeon prior to the day of surgery while some children had met the operative surgeon prior to the day of surgery.

Exclusion criteria included children with chronic illness, children with developmental delay, children taking psychiatric medication, and children with parents who did not speak English. Healthcare providers (attending and resident anesthesiologists, attending and resident surgeons, admitting nurses and operating nurses) who interacted with children in the holding area on the day of surgery were also included in this study. The Yale Human Investigation Committee (New Haven, CT, USA) approved this study, and parents and children provided written informed consent and assent as appropriate. Consent was also obtained from all healthcare providers interacting with patients at the pediatric surgery center before the start of the study.

Children and parents were recruited on the day of surgery. Following informed consent, parents completed a demographic questionnaire, and parents and children were videotaped while they waited in one of two preoperative holding rooms. Holding rooms were equipped with wall-mounted video cameras as a part of a large ongoing National Institutes of Health-supported study examining the effects of behavioral interactions on child's anxiety. Each holding room had two video cameras on opposite sides of the room mounted at different heights, ensuring that behaviors of all people in the room could be captured (i.e. families, resident and attending anesthesiologist, resident and attending surgeon, admitting nurse, and operating room nurse).

The cameras were installed in holding rooms several months before the beginning of the study to allow healthcare providers habituate to them and reduce reactivity; cameras were unobtrusive and were permanent fixtures in holding rooms (i.e. in rooms whether turned on or off). All events within the holding room were electronically monitored by a research assistant using Media Cruise© (Canopus, San Jose, CA, USA) software in an office located directly across the hall from holding rooms. The camera was directed by the assistant so that all interactions were captured, and recording was stopped once the subject left the holding room for their surgical procedure.

As a next step, our laboratory developed the Perioperative Communication Coding System (PCCS). This tool was designed to assess communication between healthcare providers and patients in the perioperative context. Behaviors most strongly related to patient satisfaction and other positive patient outcome variables and their accompanying definitions were selected from the literature for inclusion in this measure (4,5). For operational definitions of behaviors included in the PCCS as well as examples of codes and coding considerations, please refer to Appendix. Two research assistants who were blind to study hypotheses were trained in the definitions of the PCCS to reach interrater reliability values of 0.8 () using sample videotapes. The process of becoming reliable on the coding system required between 1 and 2 months.

The PCCS was applied to video data collected in the preoperative holding area; behaviors of all healthcare professionals who entered the holding room as well as children and parents were coded. If providers from different disciplines overlapped on their time in the room (i.e. a nurse and anesthesiologist were in the room at the same time), this overlap was counted toward each discipline. If providers from the same discipline overlapped on their time in the room (i.e. an attending and resident anesthesiologist were in the room at the same time), the overlapping time was not double-counted. Administration of the PCCS was facilitated by using Noldus Observer® XT (Noldus Information Technology, Wageningen, the Netherlands), a behavior-analysis software package with the capabilities to analyze behaviors of one individual, or the interactions of many. This system allows for the linking of particular behaviors (e.g. medical talk) to the subject who initiated the behavior (e.g. anesthesiologist). In addition, the system allows each behavior coded to be linked to the subject to whom the behavior was directed (e.g. toward child). Thus, the system allows for

differentiation between medical talk by an anesthesiologist from medical talk by a surgeon. Further, it allows for differentiation between medical talk directed toward a child from medical talk directed toward a parent.

The nature of each behavior is also recorded within the Noldus Observer® XT software. Specifically, some behaviors are identified as duration or 'state' behaviors while others are identified as frequency or 'point' behaviors (see Appendix). State behaviors are those in which duration of behavior are of interest in analyses (e.g. medical talk). Point behaviors are those in which the presence of the behavior is the salient characteristic; the duration of the behavior is not relevant (e.g. greeting). It is of note that Observer® XT software allows behaviors in the PCCS to occur simultaneously. Such software is necessary as the behaviors that make up communication are not necessarily mutually exclusive. For example, two state behaviors can be co-occurring (e.g. medical talk and eye contact), or a point behavior may occur within a state behavior (e.g. greeting during nonmedical talk). As behavior codes can occur simultaneously, coders evaluated each video by analysing each subject one at a time, and one behavior at a time (i.e. coding only anesthesiologist for medical talk). This process was necessary to capture each PCCS behavior with maximal reliability. Of note, complete coding required approximately 4 h per videotape.

Analyses are generally descriptive in nature and reported by specialty (anesthesiology, surgery, nursing) and level of training (resident, attending). Duration behaviors are reported as medians and 25–75% interquartile ranges of lengths of times spent engaging in behaviors. Proportions of duration behaviors are calculated by dividing the duration of behavior of interest by the length of time the provider was in the room. Frequency behaviors are reported as means and standard deviations of number of times the behavior was exhibited.

Results

Participants were 24 children aged 2–10 years (5.28 ± 2.8) and their parent/caregiver, along with their healthcare providers on the day of surgery. The majority of children were non-Hispanic white (76.2%), and there was approximately equal distribution of gender (56% male). All children underwent elective outpatient procedures and otolaryngological surgeries were the most common procedures (adenoidectomy, tonsillectomy, ear tubes, $n = 7$), followed by endoscopy/colonoscopy ($n = 6$), and minor plastics procedures (e.g. skin tag removal, $n = 5$). Other procedures included hernia ($n = 2$), strabismus ($n = 2$), and hydrocele/hypospadias ($n = 2$) repair.

Descriptive analyses of healthcare provider communication

Data on amount of time healthcare professionals spent in the room with families are reported in Table 1. Of note is that because the study was done in a university hospital, children were seen by both attending and residents; thus, results are reported separately for attendings and residents and the amount of time that any professional from each specialty (anesthesiology, surgery) was in the room. Results indicate that anesthesiologists spent a median of 6.08 min with a child prior to surgery. Surgeons and nurses spent even less time with families, with median total times of 3.27 and 4.68 min, respectively (Table 1). This is particularly surprising as these families spent about 45 min in the preoperative area prior to surgery.

In terms of behaviors exhibited while in the room, not all healthcare providers engaged in all behaviors being coded (see Table 2). In terms of specific behaviors, all providers engaged in medical talk while in the holding room, but fewer providers engaged in nonmedical talk. All anesthesiologists and 79.0% of surgeons greeted families upon entry to the room. Thirty-eight percent of admitting nurses greeted families in the holding room, but this is likely because they had already greeted families before entering the room.

Of those providers who engaged in the behaviors discussed above, proportions of time in room spent engaging in these behaviors are shown in Table 3. About 50% of the time in holding room was spent in medical talk by all disciplines and only about 6% of this time was spent in rapport-building nonmedical talk. The remaining time was spent without provider talk, in these cases parents may have been talking or providers may have been reviewing the chart.

Healthcare providers' orientations toward parents and children

Healthcare providers spent, on average, between 14.5% and 21.0% of their time in the room on eye level with the child (Table 3). The recipients of providers' medical talk and nonmedical talk are shown in Table 4. Not surprisingly, the proportion of medical talk directed toward parents was higher than directed toward children for all specialties. Nursing had the closest to an even division. On average, nurses directed 57.0% of their medical talk toward parents and 43.0% of their medical talk toward children. This pattern was reversed for nonmedical talk. Proportion of total talk in the room directed toward children is also shown in Table 4. Not surprisingly, across specialties, a higher proportion of medical talk was directed toward children as children got older except for surgeons with children in the 7- to 10-year age group.

Discussion

Under the conditions of this study, we were able to document the amount of time that healthcare providers spend in preoperative preparation with children and families on the day of surgery. Results illustrate that healthcare providers spent a limited amount of time with the families on the day of surgery. This result was surprising to both the authors of this study and to the healthcare personnel who participated in the study. Not surprisingly, the largest proportion of time across healthcare providers was spent engaging in medically-related talk; only about 6% of time in the room was spent engaging in nonmedical talk and a relatively small percentage of time was spent talking to children. In support of effective communication, the majority of providers made eye contact and showed active listening behaviors (i.e. backchannel responses). Given the similarity of the study environment to other outpatient surgery centers in university settings, it is likely that these results have external validity. Further, we believe that results of a similar study conducted in a community hospital would have been even less favorable. In community hospitals, the absence of residents requires attending anesthesiologists to complete all preoperative interviews, and most are completed among operating room cases.

Interpretation of the results is facilitated by considering the population involved. It is possible that the child patients included in this study (i.e. typically healthy and undergoing minor outpatient surgery) may have influenced healthcare provider behavior. For example, it is likely that if this study had been conducted with sick children undergoing major surgery, providers may have spent a greater amount of time in preoperative preparation. It is important to note, however, that even healthy children undergoing outpatient surgery experience psychological stress and postoperative pain as a result of these procedures. In fact, there is some research to suggest that children who experience high anxiety prior to tonsillectomy and adenoidectomy (T&A) are more likely to develop high levels of postoperative pain and delayed recovery (6). Further, a high percentage of children (up to 40%) undergoing outpatient elective surgery may develop maladaptive postoperative behavioral changes such as nightmares and separation anxiety (7,8). Given previous research in our group that has illustrated a decrease in these maladaptive behavioral outcomes following preparation for surgery (1), we propose that children such as those included in this study may benefit from receiving preparation for procedures. In this sample, such preparation was of limited duration. It is also important to note that with about 50% of the

preparation time spent engaged in medical talk, this provided families with only about 2.5 min of preoperative preparation focused on the medically-relevant information.

Several limitations of this preliminary descriptive study should be noted. First, data on preparation provided by physicians during office visits before the day of surgery are not available. Thus, it may be that children and families received additional pre-operative preparation that was not captured here. Although in office preparation is certainly important, we argue that it is not an adequate replacement for evidence-based preoperative preparation and thus does not negate the importance of these results. Typical clinic visits during which surgery is scheduled are under similar production pressures to those evidenced in the perioperative environment. Second, it is notable that the assessment of parent and child outcomes was not a part of this initial descriptive study; thus, it is not yet clear if a median of 5 min of interactions with professionals from each specialty is a low value. Future studies are needed to determine the optimal balance between provider time and patient satisfaction, but the data presented here are an important first step in highlighting the limited time available in the preoperative area before surgery. Third, potential rapport building activities (e.g. sitting in close proximity, time spent in examination) were not coded. Future studies evaluating outcomes of provider behaviors should include a more comprehensive coding scheme. Finally, the data presented here are from one university center and include a relatively small sample size; therefore, future research is needed to determine the generalizability of the findings. Because this study included healthy children undergoing routine, elective outpatient surgeries, future studies incorporating children with more chronic illness and wider inclusion of surgical procedures may be particularly important to broaden the external validity of the present findings.

Results of this study suggest that in an environment of high production pressure such as an operating room there is likely a limited amount of time on the day of surgery to interview and prepare patients. Future research that incorporates patient outcomes, including satisfaction, is needed to determine whether the current amount of time available for healthcare providers to spend with children and families is adequate. However, given the importance of preparation and the apparent lack of time for preparation on the day of surgery, we submit that there continues to be a need for preoperative preparation programs delivered prior to the day of surgery or that healthcare providers will be given more opportunity to interact with the family on the day of surgery.

Acknowledgments

Zeev N. Kain was supported by the National Institutes of Health (R01HD37007-02), Bethesda, MD.

Appendix

Noldus Observer XT is the behavioral analysis software which can analyze the frequency and duration of specific behaviors performed by an individual captured on videotape. This software divides behaviors into state events and point events. State events show the duration of a specific behavior, while point events mark the frequency a behavior occurs.

The Noldus Observer XT interface displays three categories when coding a specific behavior. These categories include subjects, behaviors, and modifiers. The subjects category depicts which individual in the video is performing a behavior of interest. Behaviors are coded to show what code on the Perioperative Communication Coding System (PCCS) an individual is performing, these are listed below. Modifiers record to whom a behavior is directed toward. The use of a modifier is necessary for specific behaviors throughout the PCCS, and are listed with their corresponding behavior below.

Subjects observed in PCCS:	Modifiers in PCCS:
Attending Surgeon (ASU)	Attending Surgeon (ASU)
Resident Surgeon (RSU)	Resident Surgeon (RSU)
Attending Anesthesiologist (AAN)	Attending Anesthesiologist (AAN)
Resident Anesthesiologist (RAN)	Resident Anesthesiologist (RAN)
Admitting/PACU Nurse (ANU)	Admitting/PACU Nurse (ANU)
Operating Room Nurse (ONU)	Operating Room Nurse (ONU)
Child Life Specialist (CLS)	Child Life Specialist (CLS)
Parent (PAR)	Parent (PAR)
Child (CHI)	Child (CHI)

Behaviors

State event

1. Healthcare provider, parent or child is in the holding room (IHR)—As soon as the healthcare provider, parent or child crosses the threshold of the holding room doorway, and/or upon hearing their first utterance upon entering the room.

Subjects linked to this code: Healthcare provider, parent, child.

Modifiers: None.

Coding note: Behaviors should only be coded as they occur within the holding room. If the video shows action outside the holding room, this should not be coded.

Verbal state event

2. Medical talk (MTK)—Any talk that directly pertains to the current treatment procedures, or somehow calls medicine to mind. Commands included in this category may be related to actual physical manipulation of the child, as this relates to the ongoing procedures. Also includes any statement denoting that a procedure is about to occur. Talk that makes reference to the study should also be coded as 'MTK'. If healthcare provider seems to be talking to self about what he/she is doing during the procedure, this must also be coded as 'MTK'.

Subjects linked to code: All.

Modifiers: All.

Example: Patient: 'So how long is this thing supposed to last?'

Health care provider: 'An hour, then about 2 h in recovery'.

3. Nonmedical talk (NMK)—Talk that does not pertain to the child's illness, medical technology or includes medically related terms.

Subjects linked to code: All.

Modifiers: All.

Example: Conversations about the child's pet, siblings, parents, etc.

Coding note:

- If it is difficult to decipher whether a statement is medical or nonmedical talk, try to take the statement out of context as if the individual were reading from a script.
- Any long blocks of medical or nonmedical talk by the healthcare provider that are punctuated by short responses from parent, should be coded as one continuous period of medical or nonmedical talk, respectively. If healthcare provider is speaking and pauses for more than 3 s, interrupting the flow of one thought, 'MTK' of 'NMK' is stopped.

Nonverbal state events

4. Health care provider at the child's eye level (EYE)—Healthcare provider leans over or squats down to speak with the child 'on the child's level'. Also includes games such as peek-a-boo, or nonverbal communication of availability. If the child is not looking at the healthcare provider when he or she is physically at the child's level, 'EYE' should still be coded.

Subjects linked to code: ASU, RSU, AAN, RAN, ANU, ONU, CLS.

Modifiers: CHI.

Coding note:

- If healthcare provider is at the child's eye level for a medical reason (taking blood pressure, temperature, etc.), 'EYE' should be scored.
- 'EYE' should also be scored if the child is positioned at the standing healthcare provider's eye level. In these cases, the healthcare provider must be *face to face* with the child; however they do not need to be speaking to the child.

5. Health care provider makes eye contact (EYC)—Healthcare provider is clearly making eye contact with the parent or child from any height or distance within the holding room.

Subjects linked to code: ASU, RSU, AAN, RAN, ANU, ONU, CLS.

Modifiers: PAR, CHI.

Coding note:

- The eyes of one individual are focused on the spot where the other individual's eyes would be.
- The coder must be able to see entire profile or entire back of other person's head.
- The person with whom the eye contact is with must not be ambiguous.
- If eye contact is broken at any time, 'EYC' must be stopped.
- If healthcare provider switches between parents' eyes, keep the modifier as PAR. PCCS does not distinguish which parent the communication is occurring with, only that it is occurring with a parent.

Verbal point events

6. Healthcare provider gives backchannel response—A remark, physical gesture, or repetition of patient's statement made by the health care provider when he/she is not holding the speaking floor. These responses show signs that the healthcare provider is listening to his/her patient.

Subjects linked to code: ASU, RSU, AAN, RAN, ANU, ONU, CLS.

Modifiers: None.

Example: 'Uh-huh', 'mm-hmm', 'sure', 'good', a nodding of the head, nurse repeats something a child has said without further elaboration.

An example of repetition as a backchannel response may include:

Anesthesiologist: 'What kind of flavor would you like?'

Child: 'Cotton candy'.

Anesthesiologist: 'Cotton candy'. (BCR).

Coding note:

- Only backchannel responses made by the health-care provider will be coded, and they are only classified as such if made in response to a patient's or parent/guardian's statements.
- If a healthcare provider begins or ends a sentence with a typical backchannel word that does not seem to serve this function, do not code 'BCR'.
- Natural breaks in head nodding constitute separate back channel events.
- There is a possibility that two 'BCR' could occur at the same time. For example, a person could nod his/her head and say, 'yeah' as a sign that they are listening. This would be coded as one backchannel. However, if there is a pause between the head nods/'yeah', 'BCR' would be coded twice (indicating two separate 'BCR' events).

7. Healthcare provider greets parent/child upon entering holding room (HGP)

—A greeting from a healthcare provider made at any point during their visit with a family.

Subjects linked to code: ASU, RSU, AAN, RAN, ANU, ONU, CLS.

Modifiers: PAR, CHI.

Examples: 'Hello', a high-five, 'good-bye', or an introduction.

Coding note:

- 'How are you?' may be coded as 'MTK', depending upon the kind of answer it elicits from the child.

Example: 'How are you?' coded as 'MTK'.

Surgeon: 'How are you?'

Parent: 'Okay, but we had a little coughing spell last night'.

Example: 'How are you?' coded as 'HGP'.

Surgeon: 'How are you?'

Parent: 'Fine, thanks'. Or 'Great, we just got back from Disney World'.

- 'HGP' may also occur as health care provider exits the holding room. This can be in the form of a 'Thank you', 'Nice to meet you', 'Take care', etc. However, if the health care provider gives a greeting that draws attention to a coming procedure, this should be coded as 'MTK' Examples: 'See you soon', 'see you in the OR', 'see you when you wake up'.

References

1. Kain ZN, Caldwell-Andrews AA, Mayes LC, et al. Family-centered preparation for surgery improves perioperative outcomes in children: a randomized controlled trial. *Anesthesiology*. 2007; 106:65–74. [PubMed: 17197846]
2. Kain ZN, MacLaren JE, Wang SM, et al. Pre-surgical preparation programs for children undergoing outpatient surgery: current status. *Anesthesiology*. 2006; 105:A955.
3. Crossley J, Davies H. Doctors' consultations with children and their parents: a model of competencies, outcomes, and confounding influences. *Med Educ*. 2005; 39:807–819. [PubMed: 16048623]
4. Krupat E, Frankel R, Stein T, et al. The four habits coding scheme: validation of an instrument to assess clinician's communication behavior. *Patient Educ Couns*. 2006; 62:38–45. [PubMed: 15964736]
5. Hall J, Irish J, Roter D, et al. Gender in medical encounters: an analysis of physician and patient communication in a primary care setting. *Health Psychol*. 1994; 13:384–392. [PubMed: 7805632]
6. Kain ZN, Mayes LC, Caldwell-Andrews AA, et al. Preoperative anxiety, postoperative pain, and behavioral recovery in young children undergoing surgery. *Pediatrics*. 2006; 118:651–658. [PubMed: 16882820]
7. Kain Z. Postoperative maladaptive behavioral changes in children. Incidence, risk factors and interventions. *Acta Anaesthesiol Scand*. 2000; 51:217–226.
8. Kain ZN, Caldwell-Andrews A, Maranets I, et al. Preoperative anxiety, emergence delirium and postoperative maladaptive behaviors: are they related? A new conceptual framework. *Anesth Analg*. 2004; 99:1648–1654. [PubMed: 15562048]

Table 1

Amount of time spent in room by specialties

	Median	Interquartile range	Range
Anesthesia			
Attending ($n = 18$)	3.7	2.1–6.0	0.5–8.1
Resident ($n = 19$)	4.8	4.0–6.3	0.1–12.0
Combined	6.1	3.3–7.0	1.0–18.6
Surgery			
Attending ($n = 19$)	3.4	1.4–4.6	0.5–15.3
Resident ($n = 4$)	2.8	1.3–7.3	1.2–8.5
Combined	3.3	1.1–4.4	0.1–16.6
Nursing			
Admitting ($n = 25$)	4.2	2.2–7.0	0.3–13.8
Operating room ($n = 11$)	3.4	1.0–5.7	0.7–25.7
Child and parent	46.5	36.1–73.6	15.2–95.3

Combined denotes amount of time any personnel from specialty (anesthesia, surgery) is in the room.

Table 2

Proportion of healthcare provider observations in which behaviors of interest were exhibited

	Anesthesia	Surgery	Admitting nurse	OR nurse
Medical talk	100	100	100	100
Nonmedical talk	69	67	57	57
Making eye contact	100	92	95	95
Eye level	69	38	62	62
Greeting	100	79	38	38
Backchannel response	95	75	95	95

Data are shown as percentages (number of providers exhibiting behavior/total number of providers $\times$ 100).

OR, operating room.

Table 3

Proportion of time in room spent engaging in particular behaviors by healthcare providers (%)

Proportion of time in room	Anesthesiology	Surgery	Admitting nurse	OR nurse
Medical talk	48.2 ± 20.3	49.7 ± 22.3	43.3 ± 14.9	42.5 ± 22.9
Nonmedical talk	6.9 ± 8.1	6.2 ± 5.3	6.4 ± 5.9	6.6 ± 7.0
Making eye contact	46.0 ± 22.3	43.1 ± 27.6	24.4 ± 17.4	33.4 ± 20.1
Eye level	21.0 ± 24.5	14.5 ± 27.5	21.3 ± 23.7	19.2 ± 30.6
For reference				
Amount of time provider was in room	4.4 ± 2.5	3.9 ± 3.4	4.7 ± 3.3	4.4 ± 7.3
Amount of time child was in room	52.2 ± 23.0			

Data are shown as mean proportion of behavior (e.g. Medical talk/time in room × 100) ± SD.

Only those healthcare providers who exhibited behavior of interest (see Table 2) are presented here.

Codes are not mutually exclusive (e.g. eye contact and talk) and exhaustive (see Appendix), thus proportions may not add to 100%.

OR, operating room.

Table 4

Proportion of type of talk directed to parent or child

	Anesthesiology	Surgery	Admitting nurse	OR nurse
Proportion of medical talk				
To parents	71.9 ± 25.3 (38)	81.9 ± 27.0 (23)	57.0 ± 22.1 (21)	60.6 ± 26.3 (11)
To children (all)	28.1 ± 25.3 (38)	18.1 ± 27.0 (23)	43.0 ± 22.1 (21)	39.4 ± 26.3 (11)
To children by age				
2–3 years	19.6 ± 16.7 (9)	18.8 ± 33.3 (6)	29.7 ± 13.2 (5)	23.8 ± 18.1 (2)
4–6 years	25.9 ± 18.1 (11)	22.8 ± 18.4 (5)	23.9 ± 10.6 (4)	44.8 ± 29.1 (2)
7–10 years	53.7 ± 19.9 (11)	29.2 ± 29.9 (6)	44.5 ± 18.9 (3)	27.7* (1)
Proportion of nonmedical talk				
To parents	22.1 ± 32.1 (25)	31.4 ± 40.1 (16)	37.3 ± 37.2 (12)	14.1 ± 24.1 (7)
To children (all)	77.9 ± 32.1(25)	68.6 ± 40.1 (16)	62.7 ± 37.2 (12)	85.9 ± 24.1 (7)
To children by age				
2–3 years	79.3 ± 29.4 (7)	86.3 ± 15.4 (5)	5.3 ± 3.9 (4)	14.9 ± 4.7 (4)
4–6 years	82.2 ± 24.5 (10)	93.2 ± 13.6 (4)	7.9 ± 3.2 (4)	8.1 ± 1.5 (2)
7–10 years	90.4 ± 23.4 (6)	69.4 ± 35.7 (4)	8.2 ± 7.1 (3)	9.7* (1)

Data are shown as mean proportions of type of talk (e.g. duration of medical talk to parent/total duration of medical talk × 100)

Number of providers who engaged in this behavior are shown in parentheses.

OR, operating room.