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Differing perceptions of preoperative communication among surgical team members

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ABSTRACT

Background: Although preoperative communication is an emerging means through which surgical teams prepare for cases, little is known regarding its current state. This study investigated this topic in a survey of surgical team members.

Methods: An 11-question survey regarding the current state of and barriers to preoperative communication among surgical team members (surgeons, anesthesiologists, and surgical nurses and technologists) was distributed at a United States academic medical center utilizing the SurveyMonkey online questionnaire tool. Statistical analyses depended on variable type.

Results: The response rate was 49.4% (170 of 344 potential responses). All groups strongly agreed that preoperative communication contributes to health care quality and patient outcomes. Surgeons rated their satisfaction with the current state of preoperative communication more favorably than anesthesiologists ($p < 0.05$). Satisfaction ratings of the current state were suboptimal across groups. The most common selection for the current timing of preoperative communication across groups was before each case (29.4% of respondents) and for optimal timing, the day before a case (31.2%). The most frequently discussed topic across groups was reported to be operating room and nursing details (72.4% of respondents). The greatest barriers to preoperative communication across groups were thought to be a lack of a standard method of communication (52.4% of respondents), lack of time (51.8%), and difficulty in determining the assigned staff for a given case (50.0%).

Conclusions: There exist differing perceptions of preoperative communication among surgical team members, which conveys an opportunity for improvement across groups. Coordination of the timing of preoperative communication and standardization of the discussed content could help mitigate current barriers.

Introduction

Surgical care in the operating room (OR) depends on effective teamwork, coordination, and communication among multiple providers. Previous studies have demonstrated that up to more than half of surgical complications are avoidable.[1,2] Importantly, communication breakdowns have been shown to result in surgical errors and surgical flow disruption.[3–5] Of note, one study found that 38% of these breakdowns occurred preoperatively, whereas intraoperative and postoperative breakdowns accounted for the other 30% and 32%, respectively.[4] In contrast, strong teamwork and communication among surgical team members have been associated with a decreased occurrence of both communication failures and adverse surgical events.[6–9] It should be noted that surgical team members have different perceptions of and expectations for teamwork and communication.[10–14] In particular, one multicenter study found that surgeons rated communication and collaboration with nurses higher than the nurses did.[13] Similarly, another study from the Netherlands demonstrated that surgeons held more

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favorable perceptions of several types of teamwork and communication than other surgical team members.[14] As such, continuing to understand how to foster the most efficacious forms of surgical communication and teamwork is a crucial endeavor.

Preoperative communication is becoming an emerging means through which surgical teams discuss and prepare for a given case. For example, the implementation of surgical safety checklists has greatly reduced morbidity and mortality around the world.[6,9,15–17] Nevertheless, there are many additional forms of preoperative communication, such as informal discussions and daily preoperative briefings. Indeed, many studies have shown that instituting preoperative team briefings leads to a decrease in communication breakdowns, reduced OR delays, and fewer surgical flow disruptions as well as to an increase in on-time surgical starts.[6,18–22] One study even showed that implementation of a comprehensive medical team training program – a component of which was utilizing checklist-guided preoperative briefings before procedures – was associated with a decreased risk-adjusted surgical mortality rate.[23] Additionally, a questionnaire-based study demonstrated that a majority of surgical team members supported the use of checklists as a means of promoting team responsibility and reducing near-misses, such as uncertainty of patient identity or surgical site.[24] Thus, it is evident that several forms of preoperative communication can significantly contribute to surgical quality and safety by facilitating preparation, establishing shared understanding, and building rapport between surgical team members before a case.

While its immense value is clear, the current state of preoperative communication between all surgical team members (surgeons, anesthesiologists, and surgical nurses/technologists) is not well-studied. For example, little is known regarding current perceptions of preoperative communication among these groups. In addition, opinions about the timing and content of these discussions have not been investigated. Furthermore, the perceived barriers to effective preoperative communication are not well-characterized. Lastly, whether the aforementioned differing perceptions of teamwork and communication between surgeons and other team members are specifically present during preoperative communication has not been elucidated. As such, the purpose of this study was to investigate these topics through a survey of all surgical team members.

Methods

Study design

A survey of 11 questions regarding preoperative communication among surgical team members was created and distributed electronically to 344 potential participants from April to July 2017. The survey was piloted within a group of OR team members, and their input was considered in drafting further iterations. There were multiple drafts and rounds of review, such that survey questions were added and refined. The survey included a combination of 7-point Likert scale, multiple answer, and single answer questions. The Likert scales ranged from 1 (indicating strong disagreement or dissatisfaction) to 7 (strong agreement or satisfaction). Topics included the current state of and barriers to preoperative communication among surgical team members (Appendix S1). Three questions that included the option for individualized responses were analyzed for recurring themes, and those that received at least three separate mentions were noted.

The prospective study population was comprised of 135 surgeons, 56 anesthesiologists, and 153 surgical nurses and technologists, all of whom were recruited from one United States tertiary care academic medical center through an internal email directory. All surveyed surgeons were faculty members within the following departments: Cardiac & Thoracic Surgery, Colon & Rectal Surgery, General Surgery, Neurosurgery, Obstetrics & Gynecology, Ophthalmology & Visual Science, Orthopaedic Surgery & Rehabilitation Medicine, Otolaryngology (Head & Neck Surgery), Pediatric Surgery, Plastic & Reconstructive Surgery, Transplant Surgery, Urology, and Vascular Surgery. All surveyed anesthesiologists were faculty members within the Department of Anesthesia & Critical Care. Surgical nurses and technologists were members of one or more of three main operative services: adult inpatient, adult outpatient, and pediatrics. This study was granted an exemption by our Institutional Review Board.

Data collection

The survey was emailed to the above-mentioned potential participants. A brief description of the study objectives and participants' rights accompanied the initial survey link and was provided again at the beginning of the survey. Up to two subsequent reminders were sent to those who had not yet completed the survey in order to maximize the response rate. All survey links were individualized to track respondents, but responses were anonymized and grouped during analysis. Data were collected using the SurveyMonkey online questionnaire tool (San Mateo, CA).

Data analysis

Survey items were examined by role within the surgical team (surgeon, anesthesiologist, or surgical nurses and technologists). Independent-samples Kruskal-Wallis and Mann-Whitney U nonparametric tests were utilized to analyze the means of 7-point Likert scale questions, whereas independent-samples median tests were utilize to analyze the medians of Likert questions. Frequency counts and percentages were tabulated for other categorical variables, such as single and multiple answer questions. Chi-squared tests were used to analyze proportions within single and multiple answer questions, and z-tests were implemented to compare column proportions. P-values (p) were calculated and considered significant at $p < 0.05$. P-values resulting from z-tests were also adjusted according to the Bonferroni method. When a global p-value was less than 0.05 for a given question, pairwise testing was conducted to determine stochastic dominance. All statistical analyses were performed with IBM SPSS Statistics 24 (Armonk, NY).

Results

Survey sample

The overall survey response rate was 49.4% (170 of 344 potential responses). The response rates were 53.3% for surgeons, 50.0% for anesthesiologists, and 45.8% for nurses/techs. Our study sample included 170 total respondents, comprised of 72 surgeons (42.4% of all respondents), 70 surgical nurses and technologists (41.2%), and 28 anesthesiologists (16.5%) (Table 1).

Current state of preoperative communication

Surgeons, anesthesiologists, and nurses/techs all strongly agreed that preoperative communication contributes to health care quality and patient outcomes (Table 2). The total mean and median on a 7-point Likert scale of agreement were 6.42 and 7, respectively, and the groups did not significantly differ from each other (mean and median $p > 0.05$). Similarly, all groups agreed that “time out” before first incision contributes to health care quality and patient

Table 1
Summary of survey respondents.

	Male, n (%)	Female, n (%)	Total, n
All Surgeons	**40 (55.5)**	**32 (44.4)**	**72**
Cardiac & Thoracic Surgery	2 (100.0)	0 (0.0)	2
Colon & Rectal Surgery	3 (60.0)	2 (40.0)	5
General Surgery	8 (88.9%)	1 (11.1)	9
Neurosurgery	3 (100.0)	0 (0.0)	3
Obstetrics & Gynecology	0 (0.0)	12 (100.0)	12
Ophthalmology	3 (60.0)	2 (40.0)	5
Orthopaedic Surgery	8 (72.7)	3 (27.3)	11
Otolaryngology – Head & Neck Surgery	2 (33.3)	4 (66.7)	6
Pediatric Surgery	2 (33.3)	4 (66.7)	6
Plastic & Reconstructive Surgery	4 (100.0)	0 (0.0)	4
Transplant Surgery	1 (50.0)	1 (50.0)	2
Urology	4 (80.0)	1 (20.0)	5
Vascular Surgery	0 (0.0)	2 (100.0)	2
Anesthesiologists	**18 (64.3)**	**10 (35.7)**	**28**
All Surgical Nurses and Technologists	**9 (12.9)**	**61 (87.1)**	**70**
Surgical Nurses	6 (10.2)	53 (89.8)	59
Inpatient	2 (6.3)	30 (93.8)	32
Outpatient	2 (11.1)	16 (88.9)	18
Pediatrics	2 (22.2)	7 (77.8)	9
Surgical Technologists	3 (27.3)	8 (72.7)	11
Adult Inpatient	3 (42.9)	4 (57.1)	7
Adult Outpatient	0 (0.0)	3 (100.0)	3
Pediatrics	0 (0.0)	1 (100.0)	1
Total	**67 (39.4)**	**103 (60.6)**	**170**

outcomes, with a total mean and median of 6.11 and 7, respectively. While the mean of nurse/tech responses was greater compared to those of surgeons and anesthesiologists ($p < 0.001$) on this question, the medians did not differ significantly among groups ($p > 0.05$).

On a 7-point Likert scale, surgeons (mean = 5.32; median = 6) and anesthesiologists (mean = 4.14; median = 4) differed in rating their satisfaction with the current state of preoperative communication with each other (mean and median $p < 0.001$). In other words, anesthesiologists expressed neutrality regarding the current state, whereas surgeons were moderately satisfied. The total mean and median across both groups were 4.99 and 5, respectively. Furthermore, anesthesiologists and nurses/techs expressed neutrality regarding the current state of preoperative communication with each other (total mean = 4.00; median = 4), and the groups did not differ from each other (mean and median $p > 0.05$). With regards to the current state between surgeons and nurses/techs, surgeons expressed moderate satisfaction (mean = 5.53; median = 6), whereas nurses/techs expressed slight satisfaction (mean = 4.97; median = 5). While the mean of surgeon responses was significantly greater than that of nurses/techs ($p = 0.024$), the median did not differ significantly ($p = 0.935$).

When asked if and when their surgical teams communicated about a case prior to entering the operating room (OR), 13 (7.6%) of respondents selected the day before a case, 16 (9.4%) the night before a case, 35 (20.6%) the morning of a case, 50 (29.4%) before each case, and 25 (14.7%) were unsure when, whereas 31 (18.2%) did not communicate prior to entering the OR (Table 3). Surgeons most frequently selected before each case (34.7% of responses; $p > 0.05$), anesthesiologists the night before a case (39.3%; $p < 0.05$), and nurses/techs no communication prior to entering the OR (30.0%; $p < 0.05$). Notably, 10 (13.9%) surgeons and 21 (30.0%) nurses/techs said that they did not communicate about a case before entering the OR. In contrast, all anesthesiologists did communicate preoperatively at some point. This is possible because not all surgical team members need to participate for preoperative communication to take place. For example, anesthesiologists may discuss with surgeons a case that they do not discuss with nurses/techs, and vice versa. Moreover, survey sampling could have also contributed to this finding.

Table 2
Current state of preoperative communication.

7-Point Likert Scale Questions[a]	Surgeons Mean (SD) Median	Anesthesiologists Mean (SD) Median	Nurses and Techs Mean (SD) Median	Total Mean (SD) Median	*p* Mean Median
Preoperative communication contributes to health care quality and patient outcomes.	6.36 (1.17) 7	6.36 (1.34) 7	6.50 (1.21) 7	6.42 (1.21) 7	0.296 1.000[b]
"Time out" before first incision contributes to health care quality and patient outcomes.	5.93 (1.31) 6	5.64 (1.52) 6	6.49 (1.15) 7	6.11 (1.32) 7	<0.001 1.000[b]
Please rate your level of satisfaction with the current state of preoperative communication between the following OR team members.					
Surgeons and anesthesiologists	5.32 (1.34) 6	4.14 (1.27) 4	–	4.99 (1.42) 5	<0.001 <0.001
Anesthesiologists and nurses/techs	–	3.93 (1.44) 4	4.03 (1.72) 4	4.00 (1.64) 4	0.832 0.870
Surgeons and nurses/techs	5.53 (1.24) 6	–	4.97 (1.53) 5	5.25 (1.42) 6	0.024 0.935

[a] For the first two questions, the Likert scale ranged from 1 (strongly disagree) to 7 (strongly agree). For the last three questions, the Likert scale ranged from 1 (very dissatisfied) to 7 (very satisfied).
[b] Since all group median values were less than or equal to the total median, $p = 1.000$.

Table 3
Current timing of preoperative communication.

	Surgeons, n (%)	Anesthesiologists, n (%)	Nurses and Techs, n (%)	Total, n (%)[a]	*p*
Day before a case	4 (5.6)	2 (7.1)	7 (10.0)	13 (7.6)	>0.05
Night before a case	3 (4.2)	11 (39.3)	2 (2.9)	16 (9.4)	<0.05
Morning of a case	23 (31.9)	7 (25.0)	5 (7.1)	35 (20.6)	<0.05
Before each case	25 (34.7)	7 (25.0)	18 (25.7)	50 (29.4)	>0.05
Unsure when	7 (9.7)	1 (3.6)	17 (24.3)	25 (14.7)	>0.05
None	10 (13.9)	0 (0.0)	21 (30.0)	31 (18.2)	<0.05
Total, N (%)	72 (100)	28 (100)	70 (100)	170 (100)	–

[a] Please note that the indicated column contains percentages of the total number of responses, whereas the first three columns contain percentages within the given column.

Additionally, respondents were asked to select the optimal time for preoperative communication given the same choices as in the previous question (Table 4). 53 (31.2%) of respondents chose the day before a case, 16 (9.4%) the night before a case, 48 (28.2%) the morning of a case, and 27 (15.9%) before each case, whereas 26 (15.3%) wrote in individualized responses. Surgeons as well as nurses/techs most frequently selected the day before a case (31.9% and 34.3% of responses, respectively), whereas anesthesiologists most commonly chose the morning of a case and individualized responses (each 25.0%). None of the selections varied among groups ($p > 0.05$). Individualized responses from 16 participants (6 surgeons, 4 anesthesiologists, and 6 nurses/techs) posited that the optimal time for preoperative communication depended on each case. Moreover, another 9 respondents (5 surgeons, 3 anesthesiologists, and 1 nurse/tech) suggested that preoperative communication should minimally occur at some point during the day of the case.

Respondents were also asked about the content of their teams' preoperative communications: 85 (54.5%) selected flow of the day, 93 (59.6%) procedure details, 87 (55.7%) anesthesia details, 113 (72.4%) OR and nursing details, 87 (55.7%) patient co-morbidities, and 52 (33.3%) patient disposition from the OR (Table 5). Respondents were able to select multiple answer choices for this question. Nurses/techs differed from the rest of their colleagues in discussing procedure details, patient co-morbidities, and disposition from the OR less frequently ($p < 0.05$). Furthermore, all three groups differed from one another with regards to discussing anesthesia details, with anesthesiologists selecting it the most and nurses/techs the least ($p < 0.05$). Surgeons as well as nurses/techs also discussed OR and nursing details more than anesthesiologists ($p < 0.05$). Lastly, 20 (12.8%) respondents wrote in individualized responses. Of those, 9 participants (5 surgeons and 4 nurses/techs) mentioned that special needs, requests, or equipment were discussed preoperatively.

Barriers to preoperative communication

Participants were also asked to select which of the following served as barriers to preoperative communication: lack of time, difficulty in determining the assigned staff for a given case, high number of staff members per case, perceived personality differences, lack of a standard method of communication, or other individualized responses (Table 6). Respondents were able to select multiple answer choices for this question. Three responses were selected by at least half of the participants: lack of a standard method of communication (52.4% of responses), lack of time (51.8%), and difficulty in determining assigned staff for a given case (50.0%). Of note, the proportion of respondents that identified a lack of time and a difficulty in determining the assigned staff for a given case as barriers significantly differed between surgeons and nurses/techs ($p < 0.05$). In other words, surgeons found a difficulty in determining the assigned staff for a given case to be more of a barrier than nurses/techs, whereas nurses/techs characterized a lack of time as more of a barrier than surgeons. Furthermore, surgeons identified a high number of staff members per case to be more of a barrier and perceived personality differences as less of one than both other groups ($p < 0.05$). Lastly, the proportion of respondents who chose lack of a standard method of communication did not differ among groups ($p > 0.05$).

With regards to individualized responses, 6 participants (5 nurses/techs and 1 surgeon) proposed that improper or incorrect scheduling served as an additional barrier. Moreover, 6 respondents (3 surgeons, 2 nurses/techs, and 1 anesthesiologist) suggested that a lack of motivation, interest, or effort by team members prevented effective communication. 3 surgeons also stated that nursing staff who were not knowledgeable about their particular procedures or equipment decreased the efficacy of communication. Lastly, 3 anesthesiologists also identified absent surgical attendings before the procedure began as a barrier.

Discussion

To our knowledge, this is the first study to survey all members of the surgical team regarding perceptions about the current state of and barriers to preoperative communication. We believe that preoperative communication is an especially relevant topic given the recent emergence of preoperative briefings, surgical checklists, “time outs” before first incision, and more as benchmarks for discussing and preparing for cases. In addition, preoperative communication bears even more significance when considering that many surgeons, anesthesiologists, and nurses/techs may work within multiple teams. The finding that preoperative communication was rated as suboptimal across groups is crucial due to the potential adverse impacts that a lack of preparation and shared understanding can have on health care quality and patient outcomes,[3–5] which all groups strongly agreed benefits from preoperative communication.

Interestingly, the differing perceptions among surgical team members that have been delineated in other surgical communication contexts were also present here.[10–14] While previous studies have demonstrated that most differences in perceptions of teamwork and communication among surgical team members exist mostly between surgeons and nurses, we found this to primarily apply to surgeons and anesthesiologists. Indeed, it seems that anesthesiologists perceive larger areas for improvement than surgeons do and that preoperative communication across groups could be enhanced. There are a variety of potential reasons for suboptimal ratings of preoperative communication across groups, such as differing expectations for the timing or content of these discussions (which was suggested by responses to the other survey questions), disparate perceptions of roles within the team, and several barriers including those that we may have not queried

Table 4
Optimal timing of preoperative communication.

	Surgeons, n (%)	Anesthesiologists, n (%)	Nurses and Techs, n (%)	Total, n (%)[a]	*p*
Day before a case	23 (31.9)	6 (21.4)	24 (34.3)	53 (31.2)	>0.05
Night before a case	5 (6.9)	6 (21.4)	5 (7.1)	16 (9.4)	>0.05
Morning of a case	22 (30.6)	7 (25.0)	19 (27.1)	48 (28.2)	>0.05
Before each case	12 (16.7)	2 (7.1)	13 (18.6)	27 (15.9)	>0.05
Other (individualized responses)	10 (13.9)	7 (25.0)	9 (12.9)	26 (15.3)	>0.05
Total, N (%)	72 (100)	28 (100)	70 (100)	170 (100)	>0.05

[a] Please note that the indicated column contains percentages of the total number of responses, whereas the first three columns contain percentages within the given column.

respondents about, such as those mentioned in individualized responses.

The differences among groups in the current content of preoperative discussions suggest that some details are more pertinent to certain groups depending on their respective roles. Furthermore, 16 individualized responses stated that the optimal time for preoperative communication depended on each case. Juxtaposed with the lack of a singular choice among groups, these comments suggest that the optimal time varies between cases as well as among team members. Therefore, embracing flexibility with regards to content and timing – such as by utilizing a digital form of communication that is accessible to all team members or by providing multiple opportunities to communicate preoperatively – may provide the most benefit to all. Lastly, in relation to perceived barriers to preoperative communication, some are more easily addressed than others. For example, providing all surgical team members with a list of the team the day before a case could quickly alleviate the difficulty in knowing the assigned staff. Others, like perceived personality differences and a high number of staff members per case, are more difficult to resolve without substantial interventions, such as team training.[6,8,23]

This study was limited by surveying one United States academic medical center and therefore being subject to the experiences and perceptions of the individuals working there. However, this also allowed us to track respondents and thereby enhance our response rate. The survey also provided pre-determined answer choices with the input of clinician experts for simpler analysis, though respondents were given the option to write individualized responses for three questions. We acknowledge that more than one answer choice may have been applicable to certain single answer questions for some respondents, such regarding as the current timing of preoperative communication. That said, we asked respondents to select a single answer with the expectation that they would choose the option that represents the majority of their clinical experiences. Moreover, we also recognize that information may be updated between initial preoperative communications, especially in discussions taking place in advance of the day of surgery. Nevertheless, the goal of this study was to ascertain the most salient instance of preoperative communication before the start of a given case with the understanding that additional conversations may have taken place afterwards. Another limitation of this study was that nurse and tech responses were grouped, though the proportion of technologists only comprised 12.9% of the surgical nurses/techs group. This was a flaw of the survey creation and kept this way in order to maintain the anonymity of responses. Lastly, anesthesiologists only comprised 16.5% of respondents, which was a result of the smaller number of anesthesiologists at this medical center in comparison to surgeons and nurses/techs. Indeed, the response rate for anesthesiologists (50.0%) was second highest among the groups.

There are various potential areas for future research regarding this topic, such as a subsequent, more specific investigation of suboptimal preoperative communication between surgeons and anesthesiologists and the impact that it may have on patient outcomes. Future studies looking for more insight into could implement various approaches, including focus group or interview-based qualitative studies. Another possible study could differentiate the characterization of preoperative communication between individuals who frequently work with the same team and those who instead work in multiple teams, something that this study did not account for. In addition, it would be interesting to examine the effects of specific interventions targeting the above-mentioned barriers on perceptions of preparation and teamwork before entering the OR. For example, our research team will soon pilot a digital communication system that is accessible by all surgical team members and study its effect on surgical team satisfaction and surgical outcomes.

In conclusion, this study demonstrated that perceptions of preoperative communication differ between surgeons and anesthesiologists, with surgeons holding a more favorable view of the current state than anesthesiologists. Moreover, the survey

Table 5
Content of preoperative communication.

	Surgeons, n (%)	Anesthesiologists, n (%)	Nurses and Techs, n (%)	Total, n (%)[a]	*p*
Flow of the day	42 (64.6)	14 (50.0)	29 (46.0)	85 (54.5)	>0.05
Procedure details	49 (75.4)	21 (75.0)	23 (36.5)	93 (59.6)	<0.05
Anesthesia details	43 (66.2)	25 (89.3)	19 (30.2)	87 (55.8)	<0.05
OR and nursing details	49 (75.4)	12 (42.9)	52 (82.5)	113 (72.4)	<0.05
Patient co-morbidities	46 (70.8)	20 (71.4)	21 (33.3)	87 (55.8)	<0.05
Disposition from OR	33 (50.8)	10 (35.7)	9 (14.3)	52 (33.3)	<0.05
Other (individualized responses)	6 (9.23)	2 (7.14)	12 (19.0)	20 (12.8)	–
Total	65	28	63	156	–

[a] Please note that the total N for this question is 156 since 14 of the 31 respondents (7 surgeons and 7 surgical nurses and technologists) from the last question who said that their teams did not communicate preoperatively did not answer this question. The remaining 17 (2 surgeons and 15 surgical nurses and technologists) who stated that they did not communicate preoperatively with their respective teams nevertheless answered this question. Also, please note that all percentages in this table are of the total number of respondents within each column since the selection of multiple answer choices was possible.

Table 6
Barriers to preoperative communication.

	Surgeons, n (%)	Anesthesiologists, n (%)	Nurses and Techs, n (%)	Total, n (%)[a]	*p*
Lack of time	21 (29.2)	15 (53.6)	52 (74.3)	88 (51.8)	<0.05
Difficulty in determining assigned staff for a case	48 (66.7)	14 (50.0)	23 (32.9)	85 (50.0)	<0.05
High number of staff members per case	40 (55.6)	3 (10.7)	14 (20.0)	57 (33.5)	<0.05
Perceived personality differences	7 (9.7)	10 (35.7)	25 (35.7)	42 (24.7)	<0.05
Lack of a standard method of communication	31 (43.1)	18 (64.3)	40 (57.1)	89 (52.4)	>0.05
Other (individualized responses)	12 (16.7)	8 (28.6)	20 (28.6)	40 (23.5)	–
Total N	72	28	70	170	–

[a] Please note that all percentages in this table are of the total number of respondents within each role since the selection of multiple answer choices was possible.

responses conveyed an opportunity for improvement across groups, most notably between anesthesiologists and the rest of the surgical team. This study also showed that individuals within the surgical team possess disparate expectations and preferences for the timing and content of such discussions, and that significant perceived barriers to this essential form of preparing for a surgical case exist, such as a lack of a standard method of communication and a lack of time. These findings can be utilized to promote knowledge about the current state of preoperative communication and to guide the development of future research and quality improvement measures aimed at fostering effective preparation, coordination, and teamwork in surgical teams before they enter the OR.

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Appendix A. Supplementary data

Supplementary data related to this article can be found at https://doi.org/10.1016/j.amjsurg.2018.06.001.

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