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Patient Values Regarding Overlapping Surgery: Identification of Distinct Patient Subgroups

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**Objectives/Hypothesis:** To explore patient values associated with their comfort level with surgical trainees and attending surgeon absence from the operating room.

**Study Design:** Qualitative interviews with general medical patients.

**Methods:** We analyzed data from qualitative interviews with patients that included a quantitative rating on a visual analog scale (VAS) of comfort consenting to three surgical scenarios, including overlapping surgery, to identify subgroups of patients based on comfort level. After identifying subgroups, we compared qualitative responses from participants who were generally comfortable with overlapping surgery to those who were uncomfortable to identify themes associated with these perceptions.

**Results:** We identified three subgroups of patients based on the patterns of VAS responses. Participants who were comfortable with overlapping surgery expressed trust in the surgeon and delegation process. Those who were most uncomfortable expressed a strong desire to know who was operating on them, and a desire for control over their surgical process. Subjects uncomfortable with overlapping surgery were also generally not sensitive to tradeoffs (cost, timing).

**Conclusions:** We identified distinct subgroups of patients based on their comfort level with trainee independence and primary attending availability. By examining the predominant values in these subgroups, we identified potential explanations for patient discomfort with attending absence. Strategies to enhance patients’ knowledge about the process of surgery and a sense of control over their own care may improve comfort with trainee participation and overlapping surgery.

**Key Words:** Overlapping surgery, attending presence, surgery, trainee, trust.

**Level of Evidence:** 6

Laryngoscope, 130:2779–2784, 2020

**INTRODUCTION**

Overlapping surgery has gained national attention since *The Boston Globe* published a Spotlight exposé on the practice in 2015.1 Despite its ostensible safety,2–5 many patients have concerns about the idea of their attending surgeon leaving the room during their operation. Although this is entirely understandable at face value, it also highlights a disconnect between surgeons’ and patients’ understanding of the typical processes at academic hospitals, where it is highly common for residents to do portions of cases appropriate to their training level with limited or no direct supervision. Many surgeons have argued that this is an essential component of surgical training.6,7

In a prior publication,8 we reported the results of qualitative interviews with patients regarding three surgical scenarios in which surgeon presence and availability were varied. As part of these interviews, we had subjects rate their comfort level consenting to these three scenarios on a visual analog scale (VAS). We discovered that subjects could be sorted based on the patterns of their VAS responses into three distinct subgroups. The purpose of the present research was to investigate the differences among subgroups and to identify values associated with level of comfort with overlapping surgery and trainee participation.

**MATERIALS AND METHODS**

This study was approved by the Vanderbilt University Institutional Review Board. Detailed methods on interviews were published previously.6,8 Briefly, one author (A.A.L.) conducted face-to-face, semistructured interviews with 40 patients recruited from the waiting room of a general medical clinic that included 38 open- and close-ended questions. The interview began with a vignette describing a nonemergent partial thyroidectomy, followed by a description of three surgical scenarios that varied by attending presence and availability (Fig. 1). In scenario 1, the attending is present throughout the case; in scenario 2, the attending leaves the room after the thyroid lobe has been removed to work on charting but can return immediately if necessary; and in scenario 3, the primary attending surgeon leaves...
the room after the thyroid lobe has been removed and starts another case, cannot return, and has assigned a cross-covering attending who is immediately available (overlapping surgery). In all three scenarios the trainee and attending are present through what was described as “the beginning and critical portion” of the procedure, and the trainee “closes the incision” (the term overlapping surgery was neither explicitly used nor explained during the interviews). Participants rated their comfort with and willingness to consent to each of the three scenarios using a VAS where a score of 0 denoted total discomfort and unwillingness to consent and a score of 100 indicated complete comfort and willingness to consent. A rating between 40 and 60 was considered unsure.

Following the rating exercise, patients were asked open and close-ended questions to explore their ratings and their understanding and opinions of the different scenarios. Participants were also asked to consider if higher risks or tradeoffs of shorter surgery wait time or monetary savings would affect their VAS ratings. Visual cutoffs between VAS ratings of uncomfortable, unsure, and comfortable were confirmed by comparison of participants’ VAS ratings and trends in the qualitative results. All interviews were recorded, transcribed, and deidentified before analysis. Qualitative data were analyzed as described previously. Briefly, a codebook was generated using a grounded theory approach, then three authors (A.L., K.B., A.A.) coded the transcripts and iteratively updated the coding strategy as new themes emerged and redundant themes collapsed; coding and recoding continued until no new themes emerged and all transcripts were coded.

For the purposes of this present exploratory analysis, we classified meaningful changes in the VAS as those 10% or greater from baseline, and classified a threshold for uncomfortable as a rating of 40 or lower. Based on these parameters/thresholds and the magnitude of change in VAS ratings across scenarios, participants were categorized into three subgroups: subgroup A had less than a 10% decline in VAS ratings for scenarios 2 and 3 relative to scenario 1 and had no VAS scores below 75 (this cutoff was chosen as squarely above the lower visual cutoff of comfortable). Subgroup B demonstrated at least a 10% change in ratings relative to scenario 1 but did not have a rating below 40. Subgroup C had at least one rating below 40. In other words, subgroup A was generally comfortable with all three scenarios, subgroup B expressed increasing discomfort, and subgroup C became wholly uncomfortable with at least one scenario. After assignment of subgroups, the already-coded qualitative results were examined in this context for distribution and preponderance of themes within subgroups. Associations between demographic variables and subgroup were tested using χ²/adjusted residual (AR). Analyses were conducted using IBM SPSS (IBM, Armonk, NY) and Microsoft Excel (Microsoft, Redmond, WA).

RESULTS

Of the 40 subjects, 30% of the VAS response patterns fit subgroup A (n = 12), 45% fit subgroup B (n = 18), and 25% fit subgroup C (n = 10) (Fig. 2). Subgroups were not significantly different based on demographic features (Table I), but were skewed toward privately insured, college-educated, white females. Negative experiences with the healthcare system were more commonly expressed by individuals in subgroup C (80%), compared to subgroups B and A (50% and 33%, respectively). Details are presented below for attending presence/trainee independence, surgical tradeoffs, and overall group characteristics, with representative quotes in Table II.

Attending Presence and Trainee Independence

Preferences for attending surgeon and trainee involvement in care differed markedly between subgroups. Subgroup C was more likely to express a preference for no trainee involvement (70% vs. 16% in subgroup A and 27% in subgroup B). In a similar manner, individuals from subgroup C were more likely to express a preference for having the primary attending surgeon physically present and/or involved in the case from start to end. Whereas only 20% of subgroup C said they would be comfortable with scenario 2 if the attending surgeon were looking at other patients’ charts yet still able to return; 83% of subgroup A and 72% of subgroup B held this opinion. In a similar vein, subgroups A and B were more likely to trust in the attending surgeon’s delegation of responsibility to trainees and other members of the care team (66% and 61%, respectively) compared to 20% of subgroup C (Table II, quotes 5–7).
In addition to attending surgeon involvement in the case, attending surgeon experience proved more important to subgroups B and C compared to subgroup A, mentioned by 72% and 70%, compared to 33%, respectively (Table II, quotes 1–4).

Surgical Tradeoffs
Perceptions regarding complications were not different between the subgroups, with most participants finding high surgical risk unacceptable regardless of scenario. Financial and time tradeoffs, however, revealed unique patterns among the three subgroups. Seventy-five percent of subgroup A would consent to an overlapping surgery to save $1,000, compared to 27% of subgroup B and 20% of subgroup C. Nearly half of subgroup A also agreed to an overlapping schedule if copay savings totaled $100 or less, compared to 17% and 0% of subgroups B and C, respectively (Table II, quotes 16–18). In contrast, 90% of subgroup C and 61% of subgroup B said that money does not affect their healthcare decision making, compared to 42% of subgroup A (even though some of these subgroup A participants were still sensitive to large, $1,000 monetary tradeoffs).

Subgroup C was more likely to mention that they could tolerate a wait time in exchange for attending presence. All 10 individuals said at least once that they would postpone their operation to avoid an overlapping surgical schedule and/or trainee involvement in the case (Table II, quote 21). Only 56% of individuals from subgroup B and 25% of individuals from subgroup A shared similar sentiments.

Overall Perceptions of the Groups
One of the primary thematic elements of subgroup A’s responses was trust. These participants were highly trusting of the medical system and in the surgeon’s judgement about their care (Table II, quotes 12 and 13). In contrast, subgroup C focused on the greater experience of the attending relative to the trainee, and placed major importance on supervision (Table II, quotes 3 and 7), on meeting those involved in their care (Table II, quote 15), and on knowing exactly who was doing what in their surgery (Table II, quotes 10 and 11). These all correlate with the idea of exerting control over the circumstances of their operation. Subgroup B was a mix between the...
two, with preferences for greater experience but acceptance of the delegation process (Table II, quotes 2 and 6). Subgroup B, like C, had stronger feelings about knowing who would be involved in their care (Table II, quotes 9 and 14), but was also more open to tradeoffs than subgroup C (Table II, quotes 17 and 20).

### DISCUSSION

An increased focus on overlapping surgery has highlighted a disconnect between surgeon and patient perceptions about acceptable logistics in the operating room. Although overlapping surgery has long been practiced and is likely safe in most circumstances, the

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**TABLE II.**

<table>
<thead>
<tr>
<th>Subgroup A, Thematic Description [a/b°], Representative Quotation</th>
<th>Subgroup B, Thematic Description [a/b°], Representative Quotation</th>
<th>Subgroup C, Thematic Description [a/b°], Representative Quotation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comfortable with an equally qualified backup or with the main surgeon being available [12/12]</td>
<td>More comfortable with attending surgeon’s experience [13/18]</td>
<td>Comfortable with attending surgeon’s experience and knowledge [7/10]</td>
</tr>
<tr>
<td>1. “I personally think that if, as long as it’s an equally qualified doctor, I don’t really care who’s doing my surgery, it’s more if it’s someone who’s not an equally qualified doctor.”</td>
<td>2. “[When] you have both my surgeon there and the person who’s learning [that] makes me feel a little more comfortable, knowing that the expert’s there just in case something goes wrong.”</td>
<td>3. “When I select a surgeon, I do it for reasons…. That’s the one I want performing my surgery, not somebody else I won’t know anything about.”</td>
</tr>
<tr>
<td>Delegation (assume care team has proper training) [8/12]</td>
<td>Supervision and delegation [13/18; 10/18]</td>
<td>Supervision [8/10]</td>
</tr>
<tr>
<td>5. “I think that I am in the proper place with proper people that all of them have the right training for doing what they are doing. Otherwise I have to assume that the hospital is incompetent….“</td>
<td>6. “I’m going to step out and say that I would think that my attending would not have that person, that doctor-in-training, there if he did not meet those qualifications to be there.”</td>
<td>7. “He’s standing there over his shoulder watching him make the cut. If his hand goes in the wrong place he can reach out and grab it and say no.”</td>
</tr>
<tr>
<td>No strong desire to meet the persons involved in care [4/12]</td>
<td>Preference for meeting the persons involved in care [11/18]</td>
<td>Important to know individual performing the surgery [6/10]</td>
</tr>
<tr>
<td>8. “No. There’s really nothing you can do about it. As long as everything went smoothly, it’s great. It’s a win for them and a win for me.”</td>
<td>9. “If it was discovered during the interviewing process that somebody other than who I thought was doing the surgery I would ask a lot of questions as to their qualifications and I probably wouldn’t accept short answers. I mean… I don’t rush through this. This is important to me.”</td>
<td>10. “I need to know every aspect of my surgery because anytime you open up anybody for anything, there’s a risk. I definitely need to know who’s in there, who’s doing what….“</td>
</tr>
<tr>
<td>Trust in training of those involved in care and in attending surgeon’s judgment [7/12]</td>
<td>Importance of relationship with surgeons involved in care [13/18]</td>
<td>Importance of relationship with surgeons involved in care [8/10]</td>
</tr>
<tr>
<td>12. “I guess I would assume that the attending wouldn’t allow the fellow to do the surgery or that portion of the surgery unless that was the appropriate time for the fellow to be doing it…. I think if I trust my attending to do my surgery, I should trust them to make decisions as well.”</td>
<td>14. “I think it’s really just because that’s the doctor, in this scenario, that I know. I would want to know that the person who’s met me, who kind of cares about me, I know that my doctors are at least a little bit invested in whether or not I survive and do well, I would want them to be in the room. Or, if not in the room, available…. if they’re going to be completely unavailable, then I feel like I would want to have a conversation with my doctor about that ahead of time…”</td>
<td>15. “If I can meet the person and know I’m comfortable with them and talk to them just for a bit, just to establish some rapport, then I would feel okay about doing that. It’s just something about knowing that someone you don’t know, you’ve never met, cutting in on you or whatever.”</td>
</tr>
<tr>
<td>More accepting of monetary incentives [9/12]</td>
<td>Variable response to financial incentives</td>
<td>Resistant to monetary incentives [4/10]</td>
</tr>
<tr>
<td>16. “I’d do it to save a dollar!”</td>
<td>17. “Any amount? Like thousands of dollars different, I would have to think about it, but if we’re talking about just like a co-pay or something…. a couple hundred dollars, no, that wouldn’t change my decision.”</td>
<td>18. “No, my life is more important than saving money.”</td>
</tr>
<tr>
<td>Would not reschedule to avoid overlapping case [11/12]</td>
<td>Would not reschedule to avoid overlapping case, though severity of condition and/or mental weight of waiting are significant to decision making [10/18]</td>
<td>Would reschedule to avoid overlapping case [10/10]</td>
</tr>
<tr>
<td>19. “No, I don’t care if it’s sooner or later. It doesn’t matter.”</td>
<td>20. “It depends. If it’s cancer, I’d probably want it out of me soon. I don’t know if I want to waste time. If it’s not cancer, if it’s something that’s more an inconvenience and we’re trying to fix it, then probably.”</td>
<td>21. “I would be willing to wait as long as it took…. because then I know his experienced hands are doing all the procedure, the surgery.”</td>
</tr>
</tbody>
</table>

*Proportion of individuals in the subgroup to which the theme applies. Size (b) of subgroups 1, 2, and 3 are 12, 18, and 10, respectively.*
concept of attending absences and trainee independence can be an intimidating idea to patients and limit their willingness to consent to such an arrangement. This is important, not only because respect for patient autonomy demands that patients be aware of and, when possible, have choices in the logistics of their care, but also because it is important to minimize perioperative anxiety.9–11

In this mixed-methods study, involving additional analysis of previously published, in-depth interviews about overlapping surgery scenarios with a sample of 40 patients, we identified patient subgroups related to comfort with trainee independence and attending unavailability. Subgroup A consisted of patients who were generally comfortable with both of these, whereas subgroup B demonstrated increasing discomfort, and subgroup C became wholly uncomfortable with at least one of the three scenarios we presented. The primary utility of these subgroups is not to classify patients per se, but rather to explore the range of values and preferences associated with comfort or discomfort with trainee independence and overlapping surgery. Importantly, these subgroups were not associated with any standard demographics (age, sex, race, education, insurance status), highlighting the importance of eliciting these preferences on an individual level during the informed consent process.

In our interviews, those participants more comfortable with trainee independence and primary attending unavailability expressed that they trusted the judgment of surgeons, trainee abilities, and the overall process of healthcare. This is consistent with prior research showing an association of trust (lack of distrust) in the healthcare system with support of overlapping surgery.12 Participants who were less comfortable with attending absence tended to focus on the importance of the primary attending’s skill and knowledge in their individual case and thus wanted the attending to oversee and perform the entire surgical intervention. These subjects also more frequently reported prior negative experiences with the healthcare system, which may in part be driving these preferences. To the degree that trainee participation and backup attendings were acceptable to these participants, they expressed a strong desire to meet and know those who would be operating on their bodies. All of these sentiments fit a theme of knowledge about and control over the process of their care, which has been identified in other qualitative research as associated with negative experiences, lack of trust, and recognition of the fallibility of physicians.13,14

An important caveat that puts these findings into perspective is that the scenarios described, while involving attending absence, represent arguably the least risky version of attending absence (closure only). In some circumstances, some surgeons might decide to be absent for more substantial portions of a case if those substantial portions are deemed noncritical. The degree to which patients who were comfortable with attending absence in our study might be less so if the attending were absent for parts other than closure. Although we believe that this does not negate our finding of trust being a driver of patient comfort, there may be a limit to patient trust, and as we found in our previous study,8 even those patients comfortable with overlapping surgery became less so when the potential risks were increased. The attending surgeon must provide transparent details about the nature of the portions of a procedure they will be entrusting to an assistant; it is up to that attending surgeon to also engender trust that this will be safe for the patient.

When we examined responsiveness to tradeoffs in light of the subgroups, we saw that those patients who were less comfortable with overlapping surgery scenarios were also less sensitive to financial and convenience tradeoffs. Furthermore, patients who are comfortable with overlapping surgery may not even see these as tradeoffs, but rather as a bonus. There was a middle ground of patients more willing to make adjustments to their comfort level based on tradeoffs, but this does not seem like a universally acceptable justification for overlapping surgery. Rather, efforts should be made to normalize the acceptability of overlapping surgery in the minds of patients instead of offering them rewards for accepting a scenario they find unacceptable. That being said, discussing the advantages of overlapping surgery to patients (e.g., timeliness of surgery) does have a role in informed consent discussions, and we did see in our previous research8 that most patients would agree to overlapping surgery to ensure more immediate care in time-sensitive cases (i.e., the lobectomy was for cancer rather than for benign disease or the condition is one that would worsen over time). Further work is needed to identify what tradeoffs would be meaningful to patients when quality would be considered equal between overlapping and non-overlapping surgery.

This additional analysis of our prior research carries the same primary limitation as the original study.8 It is based on interviews conducted at a single site and has a greater representation from college-educated, white females. The identification of distinct subgroups, however, suggests that we have identified a spectrum of values and preferences in relation to overlapping surgery that should be further explored in a larger, more diverse population. Despite the discussion around rules and regulations of overlapping surgery being a United States–specific issue, the underlying ethical tenants are more broadly applicable and also could benefit from international perspectives.

Although the association of various themes within subgroups may have differed if other cutoffs were used, we believe our a priori cutoffs reasonably reflect general sentiments regarding comfort. As the point of the subgroups was to examine trends in the data and not make absolute statements about any given individual subject, we believe this was a valid approach.

CONCLUSION

We present the identification of distinct subgroups of patients based on their comfort level with trainee independence and primary attending unavailability. By examining the predominant values in these subgroups, we identified potential explanations for patient discomfort with attending absence—not knowing who would be working on them, and a loss of control over the surgical process by not having their selected surgeon present during their surgery. Introducing trainees to patients may
therefore be a potential method for increasing comfort and also introducing a greater sense of control to patients. Furthermore, such transparency on the part of the surgeon has the potential to build trust in the surgeon–patient relationship. Finally, although subjects who were at least moderately comfortable with overlapping surgery were sensitive to tradeoffs of convenience and financial incentives, this was not compelling for those who were uncomfortable with overlapping surgery at baseline. Tradeoffs therefore show less promise as a means of making overlapping surgery more acceptable.

BIBLIOGRAPHY