

Transition Tuesdays for junior surgical residents: teaching surgical decision-making through a screen

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SUMMARY

The COVID-19 pandemic has substantially affected surgical training and the autonomy of surgical trainees in the clinical setting, with notable decreases in operating room exposure and experience. For trainees who are transitioning into roles as senior residents, these changes have limited opportunities during a critically formative period in their training. We discuss the implementation of a modified case-based instructional curriculum for intermediate-level surgical trainees, and suggest strategies to bridge the gap in clinical and operative decision-making while using a virtual learning format.

The transition from junior to senior surgical resident involves a critical role change, with focus shifting from information gathering to decision-making at a higher level, increasing levels of independence and greater leadership expectations.¹ The COVID-19 pandemic has presented a unique and unexpected challenge for junior residents making this transition. Efforts to provide coverage to high-needs clinical services and to minimize personnel exposure have required resident reallocation and modifications to service patterns. At some centres, junior surgical residents were redeployed to the intensive care unit, and care models changed such that junior residents worked in hospital only on days of assigned call. Many hospitals adjusted procedures such that attending surgeons performed surgeries without resident involvement to decrease operative times and minimize exposure of health care personnel. As a result of these system adjustments, resident exposure to both emergency department consults and time in the operating room (OR) have been substantially reduced.^{2,3}

At the University of Toronto, an innovative solution, Transition Tuesdays, was created to address the sudden paucity of exposure to clinical decision-making and basic operative approaches for junior surgical trainees. Six weekly case-based teaching sessions were offered in the evening by videoconference to all general surgery trainees in postgraduate year 2. Each session was built around a single clinical case, offering ample time for discussion of nuances and various permutations of patient presentations. Interactive discussion focused on clinical decision-making in emergency contexts, indications for operative intervention, principles of informed procedural consent and basic surgical principles. Instruction regarding operative principles centred around 3 key domains, namely how to achieve common operative exposures, relevant surgical anatomy (including identification of key vascular structures) and OR “danger zones,” such as at-risk structures that require early identification and manoeuvres that pose substantial risk for inadvertent or unrecognized injury (Table 1). Each session was about 90 minutes and was run by an education-trained clinical fellow. Attendance was entirely voluntary. To facilitate a safe learning space, the near-peer instructor conducted a pre-session brief to establish educational goals for the session, review session format and reiterate a standing open invitation for questions or commentary. Before each session, all

Table 1. Examples of skill-specific points of discussion

Example topic	Example prompts
Abdominal trauma	<ul style="list-style-type: none"> Describe how you will pack the liver; specifically, where will each hand go, what will you use and what will you have your assistant do?
Colorectal surgery	<ul style="list-style-type: none"> During left colonic mobilization, describe the directions of your retraction. What are the “red zones” of potential injury from distal to proximal during this mobilization? How will you identify the branches of the inferior mesenteric artery? What operative manoeuvre is helpful to do this?
Clinical decision-making — incarcerated hernia	<ul style="list-style-type: none"> What information might you obtain from a computed tomography scan? Will this change your management? What are the potential findings in the operating room, and how do these influence your consent process for this patient?
Intraoperative decision-making — inflammatory bowel disease v. appendicitis	<ul style="list-style-type: none"> If you are unsure whether this is inflammatory bowel disease, how will you choose resection margins for this phlegmonous mass? What features are you examining the bowel for? What operative manoeuvres may help to clarify this?

participants agreed to answer questions in the format of an oral examination in front of their peers. Anonymous 5-point Likert scale evaluations were collected, with opportunity for narrative commentary.

Of the 14 eligible residents, 10 attended 1 or more teaching sessions, and 7 attended all but 1, dependent on their call schedules. All participants agreed or strongly agreed that transition teaching sessions were appropriate for their level (mean 4.89), provided a safe space to ask questions (mean 5.00) and provided content not currently covered in educational programming for junior residents (mean 4.90). Specifically, residents commented that sessions “reinforced knowledge by having us verbalize out loud.” One resident commented, “[I was] kept engaged over Zoom in an unparalleled way ... my understanding of clinical scenarios has been deepened greatly through these sessions ... I have understood aspects of operative technique that were quite nebulous before.” All participants agreed that the innovation would be a meaningful addition to the existing junior surgical curriculum.

DISCUSSION

The best place for surgical trainees to learn how to make clinical and operative decisions is undoubtedly in the hospital, but this pilot curriculum showed that even procedural learning can be enhanced in a virtual classroom setting. Sutkin and colleagues^{4,5} have described surgeons’ use of both verbal and physical cues for intraoperative teaching during recorded OR interactions with trainees, dividing these teaching strategies into categories. The virtual learning environment eliminates the option for physical teaching, thus requiring instructors to capitalize on verbal instructive techniques that are intentionally explicit primarily in the categories of questioning, commanding and explanatory verbal teaching.⁴ Specifically, in the same way that athletes are asked to visualize their performance, focused discussion and visualization around surgical anatomy and operative strategies may complement and enhance

the learning that occurs in the clinical setting. This mental training for motor tasks has shown objective improvement in skills rating scores for practising surgeons, with less convincing results among surgical trainees.⁶ However, when this training is combined with virtual, preoperative, case-based briefings during teaching sessions, instructors may have increased ability to identify individual trainee needs and to facilitate formative reflection at multiple points during a virtual surgical case. This approach expands on how approaches to a case are done in person and allows for targeted and repeated training around specific aspects.

This adaptation of surgical skills teaching has been useful during the pandemic as a bridge for technical teaching in the OR, but trainees also agreed such instruction would be useful once clinical schedules return to baseline. Continued attendance by most residents after hours speaks to the perceived utility of these sessions. Keys to the success of this pilot curriculum included explicit establishment of a safe space and of expectations of equal participation at the beginning of each session by the near-peer instructor, as well as the absence of summative assessment as a responsibility of the facilitator, although formative feedback was provided throughout.

CONCLUSION

This early exploration and elaboration of traditional case-based teaching formats shows a way in which complex decision-making, as well as teaching of surgical and technical skills can be optimized outside of the clinical setting. Specifically, enhanced surgical skills preparation outside of the OR helps to bridge the learning gap during times of personnel redistribution, while also preparing trainees to capitalize on in-person surgical experiences. Development of such a skills curriculum outside of the clinical setting would be easily scalable on a national level, providing an opportunity for collaboration between postgraduate training programs, and for additional cohesion in surgical skills teaching across multiple sites. The ongoing uncertainty of the current pandemic offers the surgical community an impetus

and opportunity to explore this further. Increased use of virtual learning environments in place of in-person instruction provides a perfect modality for expanded implementation at both institutional and national curricular levels.

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