Improving Communication in the Operating Room: Interprofessional Simulation Training for General Surgery and Anesthesiology Residents

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Background

Bridging the communication gap between General Surgery and Anesthesiology residents is critical for enhancing team performance in emergent situations within the perioperative setting. Historically, these residents have practiced simulation training independently, despite the necessity for interprofessional collaboration in their daily practice. This disconnect can lead to compromised patient safety, poor work relations, and physician burnout.

Description of the Project

To address this, we introduced an interprofessional simulation training program. The program utilizes high-fidelity manikins for anesthesiology training and box trainers or live pigs for surgical training. Designed to be appropriate for various training years (Table 1), the simulations were written by anesthesia attendings and residents to focus on joint decision-making, enhancing communication, camaraderie, confidence, and respect among participants. General surgery attendings collaborated with the authors to ensure final simulations were of appropriate complexity and included actionable surgical concerns. Funding is supported by a $10,000 Academy of Clinician Scholars grant.

Lessons Learned / Expected Outcomes:

Post simulation surveys include the NASA Task Load Index (TLI) and questions related to perceived team performance. The TLI is used to measure the effectiveness of the purposefully induced stress response. The remaining questions will be used to assess participants' perception of their communication, camaraderie, confidence, respect, and understanding of the skills of other team members in the perioperative environment.

Inanimate (manikins, partial task trainers, box trainers)

Date	Anesthesia Resident Level of Training	Surgery Resident Level of Training	Scenarios
March 6, 2024	CA-1	PGY-2	1) Code blue in a DNI patient with a tracheostomy tube that is not functioning. 2) Power Outage.
March 13, 2024	CA-2	PGY-3	1) Post-thyroidectomy stridor and evolving hematoma in the PACU requiring emergency airway. 2) CO2 venous air embolism.
March 20, 2024	CA-3	PGY-4	1) Tension pneumothorax during laparoscopic surgery. 2) Malignant hyperthermia.

Animate (Pig) Lab

Date	Anesthesia Resident Level of Training	Surgery Resident Level of Training	Scenarios
May 1, 2024	CA-1	PGY-2	Bowel/mesentery injury
May 8, 2024	CA-2	PGY-3	Bowel and spleen injury
May 15, 2024	CA-3	PGY-4	Portal/hilar IVC injury

Lessons Learned / Expected Outcomes (cont):

Longitudinal participation is expected to show significant differences where a single interprofessional simulation event may not. The first series of simulations are incomplete with live animal sessions pending. Once completed, TLI values from live pig sessions will be compared to sessions when they were unavailable or inappropriate. Live animal simulations are expected to increase the stress response of all participants.

No statistically significant differences were observed nor expected with current sample size (62 survey respondents, 45 anesthesia, 17 general surgery). However, interim data analysis does suggest emerging trends. Reported mental demand, temporal demand, effort, and frustration on the TLI decreased with seniority (Figure 1). Surgery reported lower mental demand, temporal demand, effort, and frustration but higher performance demand than anesthesia (Figure 2). Average scores within specialties showed: decreased temporal demand with increased anesthesia year; increased physical and performance demand with surgical year. The data revealed trends of increasing measures of perceived team performance with class year in nearly all categories (Figure 3). No overall trends were observed between specialties (Figure 4). However, increasing averages were observed in all categories when comparing within specialties.

Figure 1: Average NASA TLI Response by Year of Training

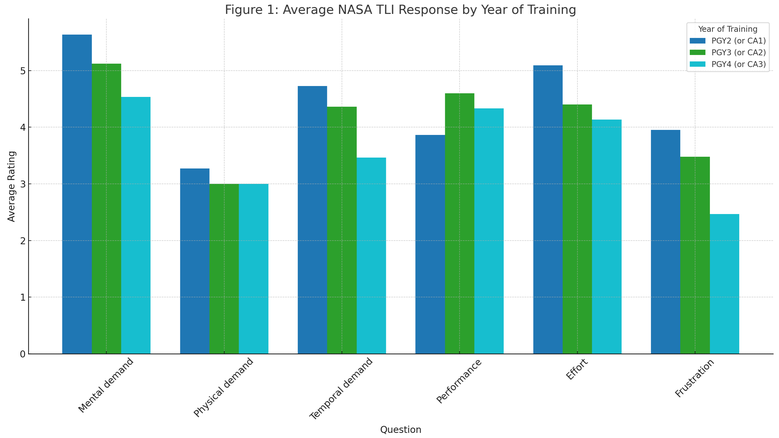


Figure 2: Average NASA TLI Responses by Specialty

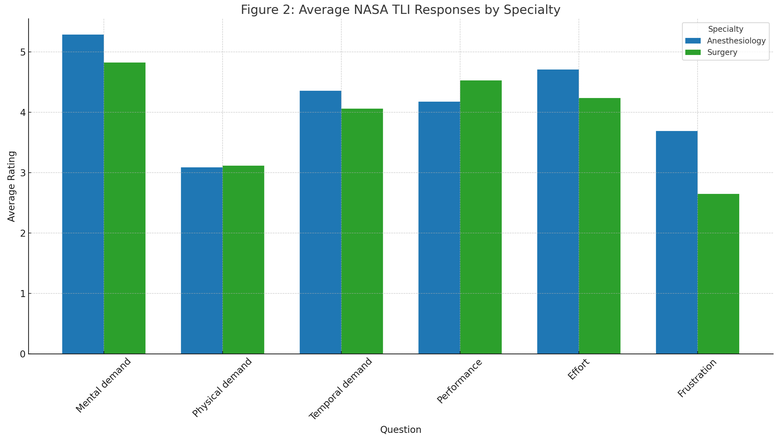
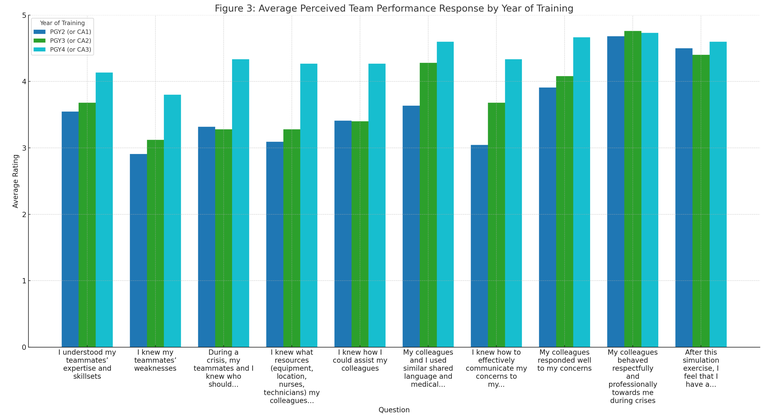


Figure 3: Average Perceived Team Performance Response by Year of Training



Recommendations / Next Steps

The project will continue over multiple years to assess longitudinal interprofessional simulation training on medical education. Additional specialties, starting with OB/GYN in the '24-'25 academic year, will be incorporated. Annual interim data analyses will ensure the program's adaptability and effectiveness. Continuous improvement in simulation scenarios and training methods will be prioritized, with the ultimate goal of establishing a best-practice model for interprofessional simulation training in medical education. This model will be made available to simulation programs at other institutions via a Joint Simulation textbook with Springer Nature.

References:

Not applicable. All content is original authorship by the project team.

Figure 4: Average Perceived Team Performance Response by Specialty