Enhancing Surgical Safety through Analysis of Teamwork During Moments of Uncertainty in the Operating Room

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BACKGROUND

- Teamwork is a critical component to safe surgical care
- Research to date has focused narrowly on studying surgical team behaviour during routine procedures
- Previous studies on teamwork rarely use observational methods that capture the complexities and everyday adaptiveness of healthcare teams
- Lapses in teamwork during uncertainty in the operating room (OR) may contribute to intraoperative adverse events (IAEs)

OR BLACK BOX ®

- The OR Black Box® platform (Surgical Safety Technologies Inc., Toronto, ON, Canada) is a novel technology that allows for the capture and subsequent analysis of synchronized audio-visual recordings of the OR environment
- Using videos to analyze teamwork skills during instances of uncertainty minimizes recall bias and provides much needed details about the communication and relationship dynamics in interdisciplinary surgical teams

RESEARCH QUESTION

- What teamwork skills are present during specific instances of uncertainty associated with IAEs and how do these vary as a function of team role (nurse vs. surgeon vs anesthesiologist vs. trainee)?

FIGURE 1. OR BLACK BOX ® INTERFACE



METHODS

- The OR Black Box® was used to analyze 70 videos of general laparoscopic surgeries over a 10-month period
- Researchers reviewed videos to identify instances of teamwork during times of uncertainty and a trained team of surgeons identified IAEs
- Each instance of teamwork during uncertainty was coded to identify specific teamwork skills by team role
- Codes were drawn from an evidence-based framework that was established using healthcare-specific teamwork literature

RESULTS

- 2,781 team competencies were identified among 4 main team roles: surgeons, nurses, anesthesia, and trainees
- 41 IAEs were observed
- During times associated with an IAE (versus no IAE), nurses, surgeons and trainees expressed significantly more backup behaviour, conflict management and psychological safety, respectively
- Anesthesiologists showed no significant difference in teamwork skills during an IAE versus no IAE

CONCLUSIONS

- Qualitative coding of data from the OR Black Box® enhances the study of team behaviors by minimizing observer recall bias through repeated viewings of each surgical case
- By linking teamwork competencies against intermediate safety outcomes (e.g., IAEs), we can identify the communication and behavioural patterns that make for successful teamwork and quantify their impact on safety
- Results will be able to inform specific and actionable teamwork strategies to improve teamwork in the OR

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