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## An evidence-based intraoperative communication tool for emergency general surgery: a pilot study



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### ABSTRACT

**Background:** Emergency general surgery (EGS) is characterized by high rates of morbidity and mortality. Though checklists and associated communication-based huddle strategies have improved outcomes, these tools have never been specifically examined in EGS. We hypothesized that use of an evidence-based communication tool aimed to trigger intraoperative discussion could improve communication in the EGS operating room (OR).

**Materials and methods:** We designed a set of discussion prompts based on modifiable factors identified from previously published studies aimed to encourage all team members to speak up and to centralize awareness of patient disposition and intraoperative transfusion practices. This tool was pilot-tested using OR human patient simulators and was then rolled out to EGS ORs at an academic medical center. The perceived effect of our tool's implementation was evaluated through mixed-methodologic presurvey and postsurvey analysis.

**Results:** Preimplementation and postimplementation survey-based data revealed that providers reported the EGS-focused discussion prompts as improving team communication in EGS. A trend toward shared awareness of intraoperative events was observed; however, nurses described cultural impedance of discussion initiation. Providers described a need for further reinforcement of the tool and its indications during implementation.

**Conclusions:** Use of a discussion-based communication tool is perceived as supporting team communication in the EGS OR and led to a trend toward improving a shared understanding of intraoperative events. Analyses suggest the need for enhanced reinforcement of use during implementation and improvement of team-based education regarding EGS. Furthermore work is needed to understand the full impact of this evidence-based tool on OR team dynamics and EGS patient outcomes.

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## Introduction

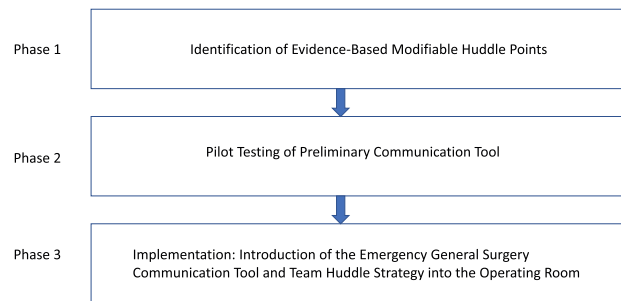
In 2010, emergency general surgery (EGS) adult hospital admissions composed 8.1% of total hospital admissions nationwide, with estimated costs of EGS hospitalizations during that same year reaching \$28 billion.<sup>1,2</sup> Following adjustment for patient-specific factors, EGS patients remain 31% more likely to experience a major postoperative complication and are 39% more likely to die than those undergoing the same procedure electively.<sup>3</sup> Emergent case status is associated with an increase in medical error rates.<sup>4</sup> Improved understanding of contributory factors and corresponding targeted quality interventions aimed to address the disparities by which EGS is presently characterized are urgently needed.

Breakdowns in communication between operating room (OR) team members are associated with adverse surgical events and postoperative malpractice claims.<sup>5,6</sup> Use of the World Health Organization (WHO) surgical safety checklist (SSC) has improved multidisciplinary communication practices, provider perceptions of surgical safety, and has reduced rates of morbidity and mortality in a variety of surgical settings.<sup>7–11</sup> Derived from principles first studied in the airline industry, the checklist tool is aimed to enhance team completion of critical tasks, which might increase risk or be deadly if missed, at junctures where detection of omission is still possible.<sup>12</sup> Through further study, the WHO SSC has been tailored to fit the specific needs of several medical specialties, inclusive of obstetrics and vascular surgery, to good effect.<sup>13,14</sup> In conjunction with checklist tools, team huddle strategies, which are purposeful exchanges of information intended to be used at any point in the continuum of patient care, have been shown to enhance communication between providers of varied disciplines.<sup>15</sup> Neither of these tools, which have advanced modern patient safety practices, has been explicitly examined in EGS.

In this study, we sought to develop and implement an evidence-based surgical safety communication tool aimed at encouraging the use of huddle strategies centered on identified modifiable factors associated with EGS patient outcomes for use in the operative care of the EGS patient. The intent of this work was not to replace the existing WHO SSC in the EGS OR; instead, we sought to enhance it by introducing points aimed to enhance multidisciplinary team discussion regarding points key to patient safety in EGS. We intended not only to create an easy-to-use tool but also to render it readily reproducible for use in a variety of hospital settings. Ultimately, by encouraging use of an intervention targeted toward communication, we aim to improve EGS outcomes.

## Material and methods

We created and tested a communication tool targeted toward the care of EGS patients through three phases of work (Fig. 1): identification of modifiable huddle points, pilot testing of our developed preliminary adjunct, and subsequent implementation of the tool into the OR. All elements of this project were approved by the Partners Healthcare institutional review board.



**Fig. 1 – Phases of communication tool development and implementation. (Color version of figure is available online).**

### Phase 1: identification of evidence-based modifiable huddle points

To develop huddle points relevant to the care of EGS patients, modifiable factors linked to EGS patient outcomes were identified through literature review and separate, previously published, quantitative and qualitative analyses.<sup>16,17</sup> Identified huddle points were validated through review by an expert panel of nine acute care surgeons.

### Phase 2: pilot testing of preliminary communication tool

The feasibility of our tool's use in an OR setting was tested through development of a simulation-based curriculum. Training sessions were held at the Simulation, Training, Research, and Technology Utilization System Center for Medical Simulation at Brigham and Women's Hospital from April through November 2016. Each training session aimed to simulate a true EGS OR and thus was composed of a team of at least one anesthesiologist, nurse, and surgeon. Participants were recruited through emails directed at all OR staff active in the care of EGS patients; willing participants were scheduled based on availability.

At the commencement of each training session, participants were surveyed using questions from the International Personality Item Pool (IPIP) for the purpose of gauging preexisting attitudes on team performance and predisposition to speak up in the instance of concern.<sup>18,19</sup> The IPIP assertiveness and bravery scales, combined, have been previously validated and have been associated with speaking-up behavior<sup>18,19</sup> (Appendix A). Participate responses are scaled in five-point Likert fashion (1 = strongly disagree, 2 = moderately disagree, 3 = neither agree nor disagree, 4 = moderately agree, 5 = strongly agree); a total maximum score for the 13 scaled questions posed to participants is 65. A single additional question regarding professional discipline was asked; no further demographic information was examined. Validation of our survey was performed through additional consultation of our panel of acute care surgical providers. Following completion of the preexercise survey, participants then underwent a simulation-based exercise in which unexpected surgical bleeding was encountered. Following this first exercise, participants were given the opportunity to debrief and

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