



Tubes, lines, and videotape: a new era for quality and safety in trauma resuscitation

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A key factor to the success of high-performance team is the ability to communicate effectively to work in unison towards a common goal. Team-based skills such as communication, mutual support and task prioritization often differentiate a team of experts from an expert team. Effective communication is a key facet of team coordination in high stakes, time sensitive environments. Far from being intuitive, multidisciplinary teams require specific training and feedback on crisis communication skills, which have a downstream effect on patient outcomes [1].

In the most recent edition of *CJEM*, Bhanju et al. [2] evaluated video recordings of trauma team activations using the trauma-non-technical skills (T-NOTECHS) tool to identify deficits in non-technical skills enabling development of strategies for improved performance in the future. The authors found that among trauma team activations, the communication and interaction score was significantly lower when compared to the other four domains. Interestingly, among the secondary outcomes, the authors found significantly more callouts and completed closed loop communication in severe trauma cases (those with an Injury Severity Score ≥ 16). The authors demonstrated the feasibility of post-hoc non-technical skills evaluation using T-NOTECHS tool in tandem with video review technology, with implications for future quality improvement (QI) initiatives.

Communication in a team environment can take many forms. Classically, the archetype of a team working in unison involves clear, uninterrupted verbal communication that occurs in closed loop. Bhanju et al. [2] posited that the lower communication and interaction score may have been due to decreased closed-loop communication and increased parallel

conversations. They plan to conduct future QI interventions to emphasize closed loop communication with a pre-briefing checklist and in situ simulation training. We must also consider how elite teams function in situations that are dynamic and involve significant time constraints, which impose challenges that may not be solved exclusively by augmenting closed-loop communication.

Elite teams are able to predict and modify behaviour based on the situation, known as adaptive coordination. Whether it is from extensive practice in elite sports or repetitions through in situ simulation, members of a team create a shared mental model in which they can respond to dynamic clinical and environmental cues. A shared mental model consists of two components: a common understanding of the required tasks and a collective approach to the team work necessary. These components facilitate performance, particularly in time constrained situations. Performance in high-stress scenarios may not be improved by simply increasing closed-loop communication, as elite teams move from explicit to implicit modes of communication [3]. The transition from explicit to implicit communication in high-stress situations is exemplified by an increasing anticipation ratio. The anticipation ratio can be viewed as the amount of information provided to the information requested. We see anticipation ratios increase above 1.0 in high-performance groups indicating a shift from explicit to implicit communication [4]. This is best exemplified in a “quiet code” in which every member of the team knows their role and how to change their actions based on patient response to interventions or changes in action of other team members without verbal communication initiated by the trauma team lead.

The use of video recording technology, highlighted in this study, is increasing in healthcare and allows for the critical appraisal of past performance. Similar to the “Black Box” used in aviation to evaluate post-hoc issues during plane crashes and near misses, video review can be used for quality control to ensure these critical non-technical skills are maintained at high levels longitudinally. In addition, video

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recordings afford the team the opportunity to dissect the complexities of high-stakes resuscitations, minimize recall biases, and promote positive team behaviours through QI projects. Post-resuscitation debriefs often highlight non-technical skills such as communication but facets such as physical space, institutional process, and team environment are often overlooked in the heat of the moment. The use of video recording technology better allows these aspects such as physical space to become more salient and if optimized will may benefit trauma team non-technical skills [5].

Non-technical skills in trauma team care and health care at large are critical for efficient and effective patient care. The use of video-recorded high-stakes resuscitations represents a critical tool to support this by more accurately evaluating verbal communication, team movement, and non-verbal cues. In gaining a real-time understanding of the team's performance, behaviors that improve patient outcomes can be promoted while elements that negatively affect the team/patient can be mitigated. It is clear that video recording and review is feasible at a large Canadian trauma centre. Building on the success of other high-performance industries, the future of trauma care must include video technology and perhaps supported by artificial intelligence review [6]. It is almost unimaginable that in 2022 we still rely on memory and a written record to review high-stakes, life-saving team performances. The time is right to take trauma care to the next level.

Declarations

Conflict of interest Andrew Petrosoniak and Chris Hicks are founders of Advanced Performance Healthcare Design, a simulation design firm. Arthur Welsher has no conflicts of interest.

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