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Improving Patient Safety Using Crew Resource Management Principles Taught Via Medical Simulation

By *David G. Lindquist, MD*

Teamwork has long been a component of safety training in high-stakes, high-risk industries such as aviation, the military, and nuclear power.¹ Some areas of medicine lend themselves naturally to a team approach (eg, trauma resuscitations, obstetrical deliveries, surgical suites, intensive care units, emergency departments).^{2,3} Nurses, physicians, technicians, respiratory therapists, and secretaries must work together in a smoothly coordinated manner to deliver timely care to acutely ill patients.

Considering the coordination required to manage a pediatric subspecialty clinic, family practice office, or cardiology suite, it is hard to imagine a health care delivery venue that does not rely on interdependent members to function smoothly. Medical decision making, revered as the crux of the health care process, is rarely the rate-limiting step. Often a system's human linchpins are the least recognized. How much work gets accomplished when the secretary is on break?

Crew Resource Management (CRM) relies on structured team behaviors that have been demonstrated to decrease communication-related errors.⁴ In one study, up to 70% of fatal aviation accidents were

attributed to communication errors.⁵ The MedTeams project, the original study that applied CRM principles to health care delivery, demonstrated a 30% reduction in observed clinical errors when the teamwork behaviors were employed.⁶

CRM operates on simple behavioral premises that are easily grasped, yet must be practiced and repeatedly reinforced in order to become ingrained. Often the greatest hurdle is getting health care providers, who are accustomed to traditional medical hierarchy, to recognize that incorporating improved team structure can make their jobs simpler, safer, and ultimately more satisfying.⁷ A key step is shifting the focus away from regarding personal responsibility as the sole means of error prevention to "everyone is responsible for a good outcome."⁸

Data from the Pennsylvania Patient Safety Authority 2007 Annual Report demonstrated that, despite the existence of the Universal Protocol, the incidence of wrong site/side procedures continues to climb.⁹ Whether this is due to a true increase or improved reporting, the continued upward trend suggests that, while perhaps necessary, a Universal Protocol is not sufficient.

As a protocol is developed for universal applicability, it loses specificity toward individual situations. One advantage of teamwork training is that it can be adapted to different disciplines. At Brown University, departments as diverse as neurosurgery, emergency medicine, and obstetrics/gynecology have undergone multidisciplinary teamwork training using a curriculum consisting of lectures and medical simulation scenarios. Participants have included technicians, secretaries, and pharmacists, as well as licensed health care providers. Strikingly, the issues discussed in the post-simulation debriefings (eg, clarity of communications, control of the room, handoffs of leadership) were identical across groups, regardless of the specialty represented. Irrespective of the clinical content, the videotaped performances demonstrated the significant potential impact of team behaviors on patient outcomes.

Various curricula are available for teamwork training. MedTeams is licensed to Dynamics Research Corporation, a private company spun off from the MedTeams project. As one of the original study sites in the MedTeams project, Rhode Island Hospital at Brown University is licensed to teach the MedTeams curriculum. The TeamSTEPPS

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(Team Strategies and Tools for Error Prevention and Patient Safety) curriculum - a later generation of MedTeams - is in the public domain and available for download via the Agency for Healthcare Research and Quality Web site. While some TeamSTEPPS vocabulary varies from the MedTeams curriculum to avoid copyright infringement, the concept is identical. Tailoring the chosen curriculum to a given department is worthwhile.

Once a curriculum is selected, the target workforce must be educated. The “train-the-trainers” approach applies, wherein internal departmental champions become fluent in teamwork concepts in order to teach their colleagues. Although this is a labor-intensive process, experience has shown that without the creation of a human infrastructure, lack of reinforcement permits learned behaviors to fade. When staff revert to old habits once the “training period” is over, considerable time, money, and effort are wasted and future attempts at improving communications may be discredited.

To reinforce CRM principles, we have incorporated medical simulation as part of the teamwork training curriculum.¹⁰ Using high-fidelity manikins and the power of video recording, we have brought entire health care teams - from the unit secretaries to the attending physicians - through our medical simulation center. Debriefing a team as they watch the playback and see themselves delivering care is a powerful stimulus for behavioral change. This

approach requires significant advanced planning that involves discussions of departmental goals, designing clinical scenarios appropriate to the practitioners, and administrative logistical and financial support for the protected training time.

Regardless of how effective a simulation-based training session might be for teamwork instruction, the most influential elements of improving teamwork behaviors are the departmental commitment to support them and individuals’ willingness to employ them.¹¹ The concepts are straightforward to learn, tremendously helpful in high-acuity settings, but also helpful in less tense situations. But a behavior’s adaptability is its weakness. A behavior rewarded is reinforced; those unsupported are extinguished. Employed routinely, CRM principles can make the stressful, challenging world of medicine a more fulfilling work environment, all the while potentially decreasing medical errors.^{12,13} That is high yield for a process that requires no additional paperwork.

David G. Lindquist, MD, is Assistant Professor in the Department of Emergency Medicine at Rhode Island Hospital, Warren Alpert School of Medicine at Brown University. He can be reached at: dlindquist@lifespan.org

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