

TeamSTEPPS™- Strategies and Tools to Enhance Performance and Patient Safety: A Collaborative Initiative for Improving Communication and Teamwork in Healthcare

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TOPICS

Evidenced-based methods for improving clinical communication for safer patient outcomes using a team-based approach to patient care.

KEYWORDS

Teamwork, communication, culture or safety, patient safety, high-reliability organizations.

1. INTRODUCTION

From lessons learned in other high risk domains to the high consequences of healthcare delivery, poor team communication and performance can lead to serious injury and even patient deaths or sentinel events. From 1995 to 2005, the Joint Commission estimated that over 65% of reported sentinel events were the result of inadequate communication and teamwork.^[1] In the 1999 US Institute for Medicine (IOM) report “To Err is Human,” recommendations were made to healthcare organizations to reduce the incidence of medical errors that were believed to claim from 44,000 to 98, 000 lives in the United States each year.^[2] Along with other evidence-based principles for safer practices, the IOM suggested that healthcare organization adopt multi-disciplinary teamwork principles analogous to crew resource management used in commercial and military aviation as well as other high-risk industries including the nuclear power industry.^[2] The US Department of Defense (DOD) Military Health System (MHS) Patient Safety Center and TRICARE Management Activity Healthcare Team Coordination Program (HCTCP) was formed as a result of a US Congressional Act in 2001 to improve the safety of patient care in the MHS. In 2003, HCTCP began a series of literature reviews and expert panel discussions to create a gold standard model for teamwork in healthcare built upon past DOD, public and industry research.^[3] The US Agency for Healthcare Research and Quality (AHRQ) collaborated with the DOD to perform an independent case study of DOD and non-DOD team training programs.^[4] Taking these findings along with earlier lessons learned from the MedTeams® project, TeamSTEPPS™-Team Strategies and Tools to Enhance Performance and Patient Safety was piloted in 2005 in MHS facilities across the world.^{[5][6]} Over 30 MHS facilities were successfully trained to use teamwork tools and

practices in multiple high-risk care settings. Based upon multiple assessments and evaluations, the TeamSTEPPS curriculum was released to the public-domain through AHRQ in November 2006. Since the public release, civilian healthcare organizations in the US and abroad have begun training and implementing the tools and strategies of TeamSTEPPS due in large part to the collaborative AHRQ networks and national implementation strategies along with safety-focused early adopter healthcare systems.^[6]

2. METHODOLOGY

The TeamSTEPPS curriculum is the culmination of over 25 years of research and evidence on teams and team performance in diverse areas (i.e. aviation, the military, healthcare, business and industry). TeamSTEPPS focuses upon four evidence-based learnable, teachable skills to improve team performance- *leadership, situation monitoring, mutual support and communication.*^[6] The patient care team includes all personnel required to effectively coordinate and deliver care across the care continuum including the patient and their family (Figure 1).

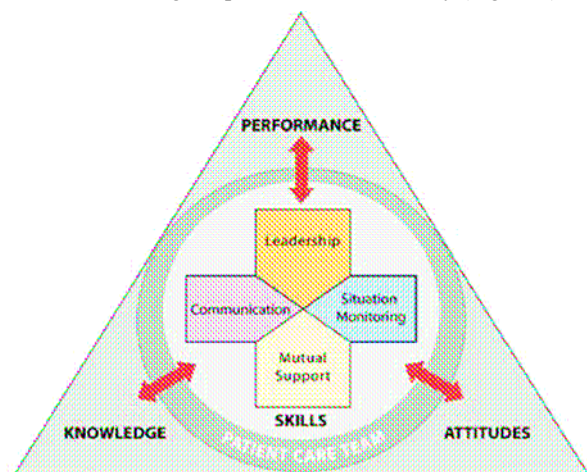


Figure 1. TeamSTEPPS Skills and the Patient Care Team

The curriculum is customizable to any healthcare setting and contains ready-to-use video vignettes and case-based scenarios for emergency care, labor & delivery, the operating room,

intensive care units and ambulatory care as well as combat casualty care for the DOD. The knowledge outcome of TeamSTEPPS is a shared mental model whereby the team is consistently “on the same page.”^{[7][8]} High performing teams have learned to communicate effectively through structured processes and systems that create a shared mental model for team performance and goals.^[9] The attitude outcomes are mutual trust and team orientation. Trust usually requires a shared past or experiences and is difficult to build in cultures that focus on blame rather than accountability. Team orientation is the level of individual value or motivation placed upon team performance and outcomes and is difficult to change in individualistic personalities. Finally, team performance outcomes include *team adaptability, accuracy, efficiency, improved productivity and safety.*^{[6][10]} The recommended process for culture change consists of three phases- **assessment, training & implementation, and sustainment** (*continuous improvement*).^{[11][12][13]} In Phase I, facilities begin an internal assessment by reviewing retrospective patient safety and quality event data, conduct local teamwork observations and interviews. Determining organizational readiness for change is an important step and should be based upon the urgency derived from the current safety climate using various culture assessment tools including the AHRQ Hospital Culture of Patient Safety.^[14] Climate improvement activities such as process redesign, leadership safety rounds and focused physician engagement may reduce common barriers to change. Phase II begins with the creation of a teamwork improvement plan focused on measurable team behaviors, team process outcomes and patient outcomes. The plan should be executed by a multidisciplinary care improvement team familiar with teamwork competencies. The TeamSTEPPS course was developed using the train-the-trainer methodology. All teamwork interventions require customization of training content, tools and strategies to ensure training content focuses on the defined improvement aim (Table 1). The planning, training and implementation process within TeamSTEPPS is based upon PDCA (Plan, Do, Check, Act) and proven Institute for Healthcare Improvement (IHI) methods.^[6]

Table 1. Sample Assessment: Findings, Aim, Intervention

Measures	Findings	Aim	Intervention
Team Outcome	Teamwork within unit 10% below benchmark from survey	Improve Safety Culture to meet benchmark in 6 mos.	Train and implement TeamSTEPPS team events brief & debrief
Team Process	Observed few team discussions prior to the beginning of the case	Conduct daily multi-disciplinary team brief before the start of each case	Create a pre-procedure checklist, brief and debrief tool for OR to use & record results
Patient Outcome	Pre-operative antibiotic	Improve > 99% in 3 mos.	Add to pre-operative checklist

	rates < 95%		
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The final phase of sustaining teamwork occurs through the practice, feedback and remediation of team performance if your organization expects to “hard-wire” success.^[15] Getting teams to use teamwork tools such as checklists requires a change in behaviors. In aviation, crews continued the use of pre-takeoff checklists only when they believed that omission like *forgetting to lower the flaps* could result in an aircraft accident.^[16] Teams that regularly participate in team events such as briefs, huddles and debriefs are better able to plan, problem-solve and self-learn creating a more adaptable team to handle unexpected changes in patient acuity or workload.^[17] TeamSTEPPS incorporates Kotter’s change theory into the curriculum to create the urgency for organization-wide behavior.^[13] Care improvement teams (change teams) must create a brief statement or “elevator pitch” for *why change is needed, the process by which change will occur* and the *role each team member will play* to realize the targeted team (including patient) outcomes. Coaching, mentoring and role-modeling the desired behaviors is the responsibility of key clinical and administrative leaders (both formal and informal) as well as unit and organizational influencers from the attending physician, to the experienced front-line nurse and the skilled unit clerk.^[18] Organizations will get the exact behaviors they reinforce therefore team-based care including the patient must remain the focus.^[19] Gradually, culture change occurs moving from “me” to “we” to “us” with the patient and their family respected and valued as team members in the patient care plan.

3. RESULTS

Measurement of TeamSTEPPS success takes place on multiple levels following the Kirkpatrick model for training evaluation using reliable measurement tools (Table 2).^[12]

Table 2. Levels of Evaluating Training Effectiveness

Level	Tools	Quantitative	Qualitative
Level 1 Reactions	Post-training evaluation	Were the learning objectives met?	Would you recommend TeamSTEPPS to a colleague?
Level 2 Learning	Training teach-back and Post-training questionnaire	Can the trainee teach-back the learned knowledge and skills?	Were the tools and strategies easy to use?
Level 3 Change in Behaviors	Observed and self-reported team behaviors	Does the team engage in regular team events with all members participating?	Are the needs of the patient and team put ahead of self?
Level 4 Outcomes	Patient Outcomes & Patient/Staff	Length between last adverse events? Would you	Are errors caught or trapped by the team before reaching patients? Has

	Satisfaction	recommend this hospital to a friend or relative?	patient harm been reduced? "good catches"
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DOD medical personnel routinely rotate or change location (every 2-3 years while some overseas locations rotate every 12 mos.) making individual longitudinal measurement difficult. Since 2005, four-hundred fifty (950) TeamSTEPPS trainers and several thousand staff members were trained in 36 different MHS facilities.^[6] Since the AHRQ public domain release in November 2006, many civilian organizations including Duke University Health System, Fairview Health System of Minnesota, Catholic Healthcare Partners System of Ohio, Johns Hopkins Medical Center, SSM Healthcare, Lahey Clinic of Massachusetts, Carillion Health of Virginia and Creighton University Health System in Nebraska among others have received TeamSTEPPS training.^{[20][21]} In both the MHS and civilian organizations, various combinations of training methods have been used including didactic instruction, simulation (both in simulation centers, in-situation, and virtual), in-unit coaching, and mentoring. Early lessons learned and sharing of best practices have been accomplished through collaborative civilian and military networks as well as the creation of an annual Technical Expert Panel conference initiated by HCTCP.^[22] Level 1 reactions to TeamSTEPPS training have been predictably positive as has been reported in previous team training efforts. In one civilian Pediatric Intensive Care Unit, 100% of participants ($n=79$) responded that they would recommend the course to a colleague.^[23] Level 2 learning is measured using a pre-training questionnaire that measures pre-training motivation, organizational climate and reported importance in teamwork. This information can be used to correlate post-training information regarding utility, efficacy, intent to transfer and affectations. Following the training, Level 3 behavioral change has focused on self-reported instruments to date mostly due to the cost and expertise required to conduct reliable (pre-post) observations and lack of reliable observation tools.^{[24][25]} The Johns Hopkins operating room reported changes in self-reported behaviors following a teamwork and communication intervention using a pre-operative briefing checklist. One question: "Surgery and anesthesia worked together as a well-coordinated team" was reported to have increased positive responses from 67.9% pre-intervention to 91.5% post-intervention ($p<.0001$). Another question asked, "A pre-operative discussion increased my awareness of the surgical site and the side being operated on" also had increased positive attitudes from 52.4% to 64.4% ($p<.0001$).^[26] TeamSTEPPS contains survey tools for measuring teamwork attitudes including team *foundation, functioning, performance, skills, leadership, climate & atmosphere, and team identity*.^[27] Some argue that teamwork evaluation should begin with observations for initial higher level success and reinforcement.^[28] Finally, Level 4 outcomes (impact on the organization & patient) have been realized. Earlier studies in emergency medicine showed a reduction in clinical error rates from 30.9% to 4.4% as teamwork attitudes improved.^[5] Quantitative clinical outcomes have been difficult to directly link to improved teamwork and communication.^[29] Many argue that existing clinical measures were not constructed with teamwork in

mind. Nonetheless, Mann, et.al reported a 50% reduction in Labor & Delivery outcomes based on average scores weighted for severity following a teamwork intervention.^[30] Sexton and colleagues reported that operating rooms with higher teamwork-aligned attitudes (climate) enjoyed 50% lower post-operative sepsis rates than the national average.^[31] A 27% reduction in nurse turnover rates and improved staff satisfaction resulted from improved teamwork attitudes.^[32] "Good catches" or identified "near misses" where patient harm has been averted due to teamwork tools and behaviors can become a powerful qualitative outcome measure. Recognizing and reinforcing good catches is one way to create incentives and rewards for team safety performance. Strong safety culture correlation suggests that nearly one-third of organizational patient safety variance can be related to patient satisfaction suggesting organizations that are safe consistently exceed patient expectations.^[33]

4. CONCLUSIONS

Patient safety organizations such as the Joint Commission and World Health Organization have embraced teamwork principles to meet and exceed required safety goals, skills and competencies.^[34] Healthcare organizations across the world have begun to see teamwork as an intervention for improving communication, leadership and other teamwork skills to reduce medical errors that lead to adverse patient outcomes. TeamSTEPPS-Strategies and Tools to Enhance Performance and Patient Safety is an easy-to-use, public domain, evidence-based teamwork curricula customizable for any healthcare setting. Culture change occurs when behaviors and resultant attitudes align through the proactive sharing of accurate information across disciplines, the use of critical language to alert & avert potential harm and the ability to practice the behaviors as part of the everyday process of delivering patient care. Multiple levels of evaluation are necessary to provide meaningful results. Team-based care rooted in the evidence for high reliability teams is what patients expect and believe organizations are already doing.^{[9][35]} The science of high-reliability teamwork remains in the early-adopter stage in US healthcare organizations. TeamSTEPPS is an evolutionary step in the right direction but further mandates, funding and research will be required to achieve widespread international dissemination, continued domain specificity and impactful behavioral change.

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