

# Improving Hospital Patient Safety Through Teamwork: The Use of TeamSTEPPS In Critical Access Hospitals

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*This brief is one in a series of policy briefs identifying and assessing evidence-based patient safety and quality improvement interventions appropriate for use by state Flex Programs and CAHs.*

## Introduction

The publication of *To Err is Human* brought unprecedented attention to the problem of medical errors, which rank among the leading causes of death and injury in the United States.<sup>1</sup> Although some authors have noted considerable advancement in the realm of patient safety,<sup>2</sup> other work suggests that harm remains common with little evidence of widespread improvement.<sup>3</sup> For CAHs, the choice of strategies for improving patient safety is critical. Many CAHs have limited quality improvement resources and infrastructure and therefore seek to undertake initiatives that will have the greatest value in terms of safety improvement.<sup>4</sup> Fitting those strategies and initiatives to the small rural hospital context is another consideration and challenge.<sup>5-7</sup>

In this brief we review teamwork and team training which have become a standard, evidence-based intervention in small and larger hospitals alike. The focus is on TeamSTEPPS, a training program developed and disseminated by the Department of Defense and the Agency for Healthcare Research and Quality. As discussed in a recent Flex Monitoring Team Report, TeamSTEPPS has been adapted and successfully used by several Flex Programs and CAHs.<sup>4</sup> Following a brief discussion of the evidence-base on teamwork and team training in improving patient safety, we discuss the TeamSTEPPS program and its use by several states and their CAH partners.

## Teamwork and Team Training in Healthcare

Research has found that 70% of all medical errors can be attributed to breakdowns in healthcare team interactions.<sup>8</sup> Patient safety experts agree that communication and other teamwork skills are critical in the prevention and mitigation

## Key Findings

- State Flex programs and CAHs have successfully adapted and used TeamSTEPPS to improve patient safety through team training.
- The evidence indicates that team training increases communications and reduces error.
- The success of TeamSTEPPS depends on having appropriate expectations and identifying and cultivating internal champions.
- Building a patient safety infrastructure helps sustain teamwork.

of medical errors, and that teamwork is essential to achieving high reliability in healthcare organizations.<sup>9-13</sup> Consequently, organizations including the Institute for Healthcare Improvement, the National Quality Forum (NQF), the Joint Commission, and the Accreditation Council for Graduate Medical Education continue to emphasize the importance of teamwork training in the delivery of safe care. Indeed, the NQF recently called for “a proactive, systematic, organization-wide approach to developing team-based care through teamwork training, skill building, and team-led performance improvement interventions that reduce preventable patient harm.”<sup>14</sup> The Joint Commission’s 2011 Critical Access Hospital National Patient Safety Goals also underscore the importance of promoting teamwork behaviors and improving staff communication in order to prevent errors.<sup>15</sup>

Poor patient outcomes stem from systemic failures in the delivery of care. While individual fallibility is a contributing factor in the occurrence of medical accidents, most human errors are induced by unaddressed latent failures that are built into the system and present long before a particular accident occurs.<sup>1</sup> Kohn et al argued that health care organizations should develop a “systems” orientation to patient safety rather than an approach that finds and attaches blame to individuals. This requires the establishment of operational systems and processes that increase the reliability of patient care. This can include simplified and standardized procedures, built in redundancies that provide backup and opportunities for recovery, improved communication and coordination within teams, and the redesign of equipment to improve the human-machine interface. Accordingly, the Committee on Quality of Healthcare in America called for the development of multidisciplinary team training programs based on proven methods such as Crew Resource Management.<sup>1,16</sup> Research suggests that when care processes are standardized, individuals become cognizant of their teammates’ responsibilities in addition to their own, and this shared mental model allows for the identification of errors before they lead to patient harm.<sup>17</sup>

While inter-professional teamwork is common in health care, the training of health professionals is generally isolated by discipline.<sup>1,16</sup> This differentiation in training and education can result in varying norms and values, particularly as related to team leadership, communication, and decision making in the treatment context.<sup>18</sup> Hierarchical communication and decision making processes,<sup>9,19,20</sup> “silos” reinforced by the organization of care and the disparate training of health care professionals,<sup>1,21</sup> and differing communication styles among clinicians<sup>9,22</sup> have all been cited as barriers to achieving safer care.

Teamwork is neither an automatic consequence of grouping individuals together, nor does it require that individuals work together on a permanent basis; rather, teamwork is sustained by a shared set of knowledge, skills, and attitudes.<sup>18,23</sup> Based on a review of the literature on teams and teamwork behavior, Salas et al<sup>17</sup> identified team leadership, mutual performance monitoring, back-up behavior, adaptability, and team orientation as the core competencies of teamwork and further argued that these competencies are supported by the coordinating mechanisms of shared mental models, closed-looped communication, and mutual trust. Subsequent work posited that of these teamwork skills, leadership, mutual support, situation monitoring, and communication are of particular importance in the safe delivery of care.<sup>18</sup> When incorporated into team training interventions, these skills produce performance-based, knowledge-based and attitudinal outcomes.<sup>24</sup> Reflecting these findings, TeamSTEPPS was designed to improve participant knowledge of, skills in, and attitudes toward team leadership, mutual support, situation monitoring, and communication in order to enhance the quality, safety and efficiency of health care.<sup>24,25</sup>

### **TeamSTEPPS**

TeamSTEPPS was developed by the Department of Defense (DoD) in collaboration with the Agency for Healthcare Research and Quality (AHRQ). The program is based on over twenty

years of research on teamwork, team training, and culture change<sup>25</sup> and draws on the DoD's expertise in medical and non-medical team training and performance as well as the extensive research in patient safety and health care quality.<sup>21</sup> Released in the public domain in November 2006, TeamSTEPPS training is intended to clarify team roles and responsibilities and optimize the use of information, people, and resources to achieve the best clinical outcomes for patients.<sup>26</sup> By providing tools and strategies to cultivate the core teamwork competencies of leadership, situation monitoring, mutual support, and communication, TeamSTEPPS aims to increase team awareness through a shared mental model.<sup>27</sup> Based on the concept of "just culture," the program seeks to foster an environment of mutual respect wherein all members of the team feel comfortable voicing patient safety concerns irrespective of their perceived positions or roles.<sup>28</sup> TeamSTEPPS aims to transform the culture of an organization by establishing a common language for talking about communication and teamwork failures; by bridging professional divides and leveling hierarchy; by providing teachable-learnable skills and actions to practice; and by conceptualizing the patient as a valued team member.<sup>27</sup>

The TeamSTEPPS toolkit is adaptable to the specific needs and circumstances of health care providers and offers specialty scenarios for training in emergency departments, surgical suites, birthing centers, intensive care units, physician's offices, and ambulatory care clinics among others.<sup>29</sup> The flexible design of the toolkit gives CAHs the opportunity to customize their use of the program, choosing to adopt only those tools, concepts, and strategies appropriate for their facility. The program is intended for a full range of healthcare professionals including nurses, physicians, pharmacists, technicians, therapists, office assistants, and hospital leadership, all of whom must coordinate their activities to achieve safer and more efficient care.<sup>25</sup> Indeed, sustained support and commitment at the executive, departmental, and caregiver levels are vital to successful implementation.<sup>23</sup>

The program is designed to occur in three continuous phases including (1) a needs assessment; (2) planning, training, and implementation; and (3) reinforcement and sustainment.<sup>26</sup> The initiative uses a "train-the-

trainer" model to create teamwork instructors with the skills to coach other staff members. Trainers employ a range of multimedia instructional strategies including traditional classroom teaching, case study analysis, role playing, coaching exercises, PowerPoint presentations, and video vignettes.<sup>28</sup> In order to reinforce lessons learned during training, the toolkit provides simple tools such as mnemonic devices, checklists, and a condensed pocket guide. Also, refresher trainings can be conducted using the entire curriculum, individual modules, or particular teamwork tools. For more information about TeamSTEPPS, visit <http://teamstepps.ahrq.gov>.<sup>30</sup>

### **Evidence Base**

A number of studies have evaluated TeamSTEPPS and other team training interventions. A review of the latest literature on the effectiveness of teamwork training in healthcare found that while the research covers a broad spectrum of both validation and effectiveness studies, few of these works link specific learner outcomes with process measures and organizational outcomes.<sup>31</sup> The multiple metrics needed to quantify the relationship between team training and team outcomes, and the complexity of obtaining them, are sizeable obstacles to the attainment of such data. Furthermore, the low rate of medical error occurrence relative to all cases makes it difficult to examine reductions in the number of medical errors that result from team training.<sup>18</sup>

Nonetheless, studies have begun to establish the evidence base for team training. In an evaluation of the MedTeams project, an early version of TeamSTEPPS, Morey et al<sup>23</sup> found that the program increased specific teamwork behaviors, enhanced staff attitudes towards teamwork, and reduced clinical errors in the emergency department. An evaluation of a large community hospital system identified a positive relationship between TeamSTEPPS training (for both clinical and nonclinical staff) and perceptions of patient safety culture and teamwork among staff, the quantity and quality of presurgical procedure briefings, and the use of teamwork behaviors during cases.<sup>32</sup> The implementation of TeamSTEPPS in an inpatient mental health facility

resulted in a restructuring and formalization of multi-disciplinary team meetings, improved role clarity among team members, and observed improvement in team behavior and performance.<sup>33</sup>

Evaluations of team training in the operating room (OR) environment have produced similar findings. Studies have shown a reduction in the occurrence of retained foreign objects,<sup>34</sup> improved error avoidance rates, and an increase in the properly timed administration of prophylactic measures.<sup>35</sup> Team training has also been shown to enhance communication, increase employee satisfaction, and reduce turnover among nursing staff.<sup>9</sup> In another study of the OR, while physicians and nurses felt that Crew Resource Management training improved the environment for reporting and discussing surgical errors, surgeons did not share their positive assessment, indicating a lack of support by OR leadership and a potential impediment to the sustainable implementation of the initiative.<sup>36</sup>

Team training interventions have demonstrated effectiveness in other care settings as well. Implementation of the situational briefing model SBAR (situation, background, assessment, recommendation) to improve communication handoffs among all clinical units in a medical center resulted in a reduction of adverse drug events and improved medication reconciliation upon both admission and discharge.<sup>37</sup> Research on team training outcomes in labor and delivery units demonstrated significant reductions in the occurrence and severity of adverse events.<sup>38</sup> Another study found that use of a daily goals form to facilitate staff communication resulted in a 50% reduction in patients' mean ICU length of stay.<sup>39</sup> For more on the effectiveness of team training in health care, and guidance on implementing health care team training programs, see the additional resources box at the end of the document.

## **The Implementation and Use of Team Training in CAHs**

As Wholey et al<sup>5</sup> and Anderson et al<sup>40</sup> have noted, successful implementation of patient safety interventions requires that CAHs and other rural hospitals adopt interventions suited to the environmental context and needs of their facilities. Because much of the research and development of TeamSTEPPS, and patient safety interventions generally, has occurred in large military, urban, and academic hospitals, it is not always clear that such interventions can be successfully applied to small rural facilities.<sup>25,41-42</sup> Several studies have evaluated TeamSTEPPS and other team training interventions in CAHs and other rural hospitals and report encouraging findings.<sup>43-44</sup>

Rural hospitals often lack the necessary means to adopt patient safety strategies commonly found in larger facilities due to organizational, technological, staffing, and financial constraints.<sup>5,45</sup> Also, the lower census and limited service mix of small rural hospitals results in a limited volume of measureable events, making it more difficult to reliably assess the safety environment of rural hospitals prior to and following patient safety interventions.<sup>42,46</sup> Other research has suggested that cultural dynamics and communication norms in rural hospitals may differ from those in larger facilities,<sup>47</sup> an important factor to consider when implementing the TeamSTEPPS program.

Regardless of the distinctive conditions found in small rural hospitals, organizational and interpersonal barriers that hinder effective teamwork such as the inter-professional nature of healthcare delivery, the differing communication styles that result from the disparate training of health professionals, and the hierarchical decision making processes that characterize the medical profession remain

relevant in the rural context. Moreover, medical errors are a concern that every hospital, large or small, must address.

A recent review of quality improvement initiatives by the Flex Monitoring Team described Nebraska's and Idaho's experiences with TeamSTEPPS training.<sup>4</sup> At the time of the study,<sup>34</sup> Nebraska and nine Idaho CAHs had voluntarily participated in the program. In Nebraska, two hospital networks were involved with almost all hospitals participating; additional hospitals outside of these networks elected to participate individually. In both states, the State Flex Programs provided funding and partnered with the University of Nebraska Medical Center and the Idaho Quality Improvement Organization (QIO) to design and deliver the TeamSTEPPS training. Flex Coordinators in both states reported that they observed heightened awareness among staff of the importance of communication and teamwork in improving patient safety.

State Flex Program and hospital staff in both states noted several factors that affected the success of the training.<sup>4</sup> First, study respondents underlined the importance of identifying and cultivating internal champions and achieving early buy-in at all levels of the hospital. Secondly, both states pursued a phased implementation because the program requires a significant commitment of time and effort, and personnel in some hospitals were unable to participate due to time constraints and work commitments. Lastly, respondents emphasized the importance of prioritizing the problems that CAHs choose to focus on. Developing consensus on this matter can be particularly challenging in multi-hospital networks given hospitals' varying patient safety concerns, however both states reported that the AHRQ

(a key component of the assessment phase of TeamSTEPPS) was useful in identifying common areas of need. Indeed, another recent study of patient safety initiatives in rural hospitals found that the Hospital Survey on Patient Safety Culture stimulated the environment for patient safety, promoting a sense of shared responsibility for patient safety among all staff members.<sup>46</sup>

### **Lessons for States and CAHs Considering Use of TeamSTEPPS**

Patient safety remains a priority for State Flex programs and their CAH partners. TeamSTEPPS has been shown to be an effective and feasible intervention tools for improving communication, enhancing teamwork, and reducing errors. Moreover, the TeamSTEPPS tools are readily available and adaptable to the CAH environment. To further inform states and CAHs interested in implementing TeamSTEPPS, the Maine Flex Monitoring Team staff convened a rural patient safety expert panel<sup>†</sup> with representatives from federal and state government and academia to share their experiences with TeamSTEPPS and offer guidance to CAHs that may be considering implementing the program. This section summarizes the lessons for states and CAHs that emerged from the discussion.

#### ***Modify expectations, aim for incremental, not transformation change in patient safety culture***

The panel emphasized that TeamSTEPPS is perhaps the single most pervasive vehicle for changing culture that hospitals can adopt, involving not only the direct care workforce but also billing, medical records, janitorial and other support staff; moreover, panel members

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<sup>†</sup> Panel members included Katherine Jones, PT, PhD, Assistant Professor in the Department of Physical Therapy Education at the University of Nebraska, Paul Moore, DPh, Senior Health Policy Advisor at the Federal Office of Rural Health Policy, Judy Tupper, MS, CHES, Managing Director of Population Health and Health Policy at the Cutler Institute for Health and Social Policy and Director of the Maine Patient Safety Collaborative, and Mary Sheridan, RN, Director of the Idaho State Office of Rural Health and Idaho Flex Coordinator.

also underscored the importance of integrating the patient as part of the care team. However, while tension may arise over whether a culture shift should be incremental or transformational in scope, CAHs should keep in mind that gradually modifying existing behaviors and procedures, rather than overtly challenging employee belief systems, is often better received and more achievable.<sup>48</sup>

### ***Be clear about priority patient safety problems to be addressed***

In preparing to implement TeamSTEPPS, it is important for CAHs to clearly define their patient safety problems, identify an inter-professional change team that includes senior leadership such as the CEO, CFO, or the Director of Nursing, and create an action plan that articulates specific aims and goals.<sup>48</sup> Obtaining early buy-in from hospital leadership can go far towards encouraging the use of error reporting and patient safety data to drive quality improvement efforts. Moreover, a commitment to becoming a “learning organization” is fundamental to the successful implementation of TeamSTEPPS and, to foster a hospital-wide “just culture” that values the open reporting of adverse events, leadership must be committed to the ongoing education of all hospital staff.

### ***Plan the delivery of training carefully to accommodate CAH staff participants***

CAHs should consider a number of approaches to ease the implementation of TeamSTEPPS. For example, conducting in-person training events in a centralized location can ease the burden on resource-strapped CAHs, and help to encourage statewide participation in the time and labor-intensive trainings. Holding follow-up conference calls to share lessons learned in participating facilities has proven to be another highly effective support strategy. Another approach CAHs may find particularly useful is to shorten training sessions in order to

limit the time and human resource demands of TeamSTEPPS. Whereas the course typically requires two days of intensive training, master trainers in a Minnesota health care system reportedly condensed the sessions into periods ranging from four hours to as little as thirty minutes, thus limiting the amount of time staff had to be absent from regular work duties.<sup>49</sup>

### ***Use available resources to support the training***

In mid-2008, AHRQ began release of a series of webinars addressing the National Implementation of TeamSTEPPS. Webinar 5, titled TeamSTEPPS and Critical Access Hospitals is led by Katherine Jones, PT, PhD, and features her experience implementing the program in rural healthcare facilities. Jones has long been closely involved in a statewide effort to implement TeamSTEPPS in all of Nebraska’s 65 CAHs.<sup>48</sup>

The AHRQ webinar offers advice to small rural hospitals that plan to adopt the TeamSTEPPS program. First of all, Jones emphasizes the importance of conducting a comprehensive readiness assessment using the TeamSTEPPS site assessment tool and the AHRQ Hospital Survey on Patient Safety Culture (HSOPSC). A rural-adapted version of the survey is available online at the University of Nebraska Medical Center website.<sup>50</sup> As part of the readiness assessment, Jones advises that hospitals compile data on core measures (such as those advocated by the Joint Commission) and use those data to identify their top three patient safety concerns. Hospitals should focus on the tangible improvements they want to achieve with regard to core measures, and frame their approach based on the changes they would like to see in future HSOPSC results.

CAHs should also consider any past team training experiences, identify successes and weaknesses, and relate TeamSTEPPS to previous patient safety interventions undertaken by the hospital. Jones also suggests that master trainers

should tailor the TeamSTEPPS coaching scenarios to reflect the CAH environment, and keep in mind that active learning is often more effective than lecturing.<sup>48</sup> Importantly, CAHs should also draw on the support and resources of QIOs, the State Offices of Rural Health, and available Flex Program funds to aid in their implementation efforts.

### ***Building a supportive patient safety infrastructure helps sustain culture change***

In order to sustain culture change, CAHs should also take tangible steps to develop a supportive infrastructure. For example, leadership can promote continuous organizational learning by supporting, for example, root-cause analyses and engaging in walk-arounds; and hospitals can integrate TeamSTEPPS into new employee orientation, competency testing, and staff performance evaluation.

According to our patient safety expert panel, some of the best results have been achieved at hospitals that actually modified their job descriptions and performance evaluations to reflect the skills embodied in the TeamSTEPPS toolkit. This helps ensure ongoing use of the program to conduct refresher courses and extend the training to new hires. Jones also recommends that CAHs publish an informational press release in the local paper describing the TeamSTEPPS initiative and identifying the hospital's master trainers. The press release not only serves to highlight the dedication of CAH staff and demonstrate the hospital's commitment to patient safety, it also encourages accountability and follow-through by broadcasting the hospital's intentions, creating a social contract with the local community.<sup>48</sup>

### **Examples of TeamSTEPPS in Critical Access Hospitals**

Staff at **Mountain View Hospital in Madras, Oregon**, a 25-bed CAH, report that TeamSTEPPS training resulted in the following improvements:

- Improved communication at their hospital, leading to increased speed and coordination during critical care situations in the emergency department and allowing for the rapid identification and correction of emergent problems
- Inclusion of patients and their families in team huddles and care planning has fostered greater patient engagement in the care process
- Reduction in or prevention of incorrect dosage orders, protocol errors, and supply shortages as a result of the new practices
- Increased satisfaction reported by patients and staff following the implementation of TeamSTEPPS at the hospital

To overcome a lack of physician buy-in, the hospital established a peer-to-peer orientation program which has eased implementation efforts. Master trainers at the hospital also noted the low direct cost of the program as a key advantage to using TeamSTEPPS.<sup>49</sup>

According to the Iowa Flex State Profile for 2011, **CAHs in Iowa** have partnered with the state QIO to provide TeamSTEPPS train-the-trainer and master trainer courses to seven CAHs. Thirty-two staff members, including quality improvement coordinators, director of nurses, department heads, and physicians took part in the training.<sup>51</sup>

## References

1. Kohn LT, Corrigan JM, Donaldson MS, Eds. *To Err Is Human: Building a Safer Health System*. Washington, DC: National Academy Press; 2000.
2. Wachter R. Patient Safety at 10 Years: How Far Have We Come? What's Next? *OR Manager*. 2010 Mar; 26:1, 5-7.
3. Landrigan CP, Parry GJ, Bones CB, et al. Temporal Trends in Rates of Patient Harm Resulting From Medical Care. *New England Journal of Medicine*. 2010 Nov 25; 363:2124-34.
4. Coburn, AF, Richards, M, Race, M, Gale, J. *Models for Quality Improvement in Critical Access Hospitals: The Role of State Flex Programs*. (Briefing Paper No.25). Portland, ME: Flex Monitoring Team; March 2010. <http://flexmonitoring.org/documents/BriefingPaper25-QI-Models-CAH-State-Flex-Program-Role.pdf>
5. Wholey D, Moscovice I, Hietpas T, Holtzman J. The Environmental Context of Patient Safety and Medical Errors. *Journal of Rural Health*. 2004 Fall; 20:304-13.
6. Casey MM, Wakefield M, Coburn AF, Moscovice IS, Loux S. Prioritizing Patient Safety Interventions in Small and Rural Hospitals. *Jt Comm J Qual Patient Saf*. 2006; 32:693-702.
7. Vartak S, Ward MM, Vaughn TE. Patient Safety Outcomes in Small Urban and Small Rural Hospitals. *Journal of Rural Health*. 2010 Winter; 26:58-66.
8. Studdert DM, Brennan TA, Thomas EJ. What have we learned from the Harvard Medical Practice Study? In: Rosenthal MM, Sutcliffe KM, Editors. *Medical Error: What Do We Know? What Do We Do?* San Francisco, CA: Jossey-Bass; 2002:3-33.
9. Leonard M, Graham S, Bonacum D. The human factor: the critical importance of effective teamwork and communication in Providing Safe Care. *Qual Saf Health Care*. 2004 Oct; 13 Suppl 1:i85-90.
10. Baker DP, Gustafson S, Beaubien JM, Salas E, Barach P. Medical Team Training Programs in Health Care. In: Henriksen K, Battles JB, Marks ES, et al., Editors. *Advances in Patient Safety: New Directions and Alternative Approaches. Vol. 4. Programs, Tools, and Products*. Rockville, MD: Agency for Healthcare Research and Quality; 2005;4:253-267.
11. Baker DP, Day R, Salas E. Teamwork as an essential component of high-reliability organizations. *Health Services Research*. 2006 Aug; 41:1576-98.
12. Clark PR. Teamwork: Building Healthier Workplaces and Providing Safer Patient Care. *Critical Care Nursing Quarterly*. 2009 Jul-Sep; 32:221-31.
13. Riley W, Davis SE, Miller KK, McCullough M. A Model for Developing High-Reliability Teams. *Journal of Nursing Management*. 2010 Jul; 18:556-63.
14. National Quality Forum (NQF). *Safe Practices for Better Healthcare- 2010 Update: A Consensus Report*. Washington, DC: NQF; 2010.



15. The Joint Commission. *Critical Access Hospitals: 2011 National Patient Safety Goals*. [Web Page]. 2011, March 21. Available at: [http://www.jointcommission.org/assets/1/6/2011\\_NPSGs\\_CAH.pdf](http://www.jointcommission.org/assets/1/6/2011_NPSGs_CAH.pdf). Accessed April 5, 2011.
16. Institute of Medicine. *Crossing the Quality Chasm: A New Health System for the 21st Century*. Washington, DC: National Academies Press; 2001.
17. Salas E, Sims DE, Burke CS. Is There a "Big Five" in Teamwork? *Small Group Research*. 2005; 36:555-599.
18. Alonso A, Baker DP, Holtzman A, et al. Reducing Medical Error in the Military Health System: How Can Team Training Help?: Large Scale Human Resource Initiatives in the U.S. Federal Government. *Human Resource Management Review*. 2006; 16:396-415.
19. Keenan GM, Cooke R, Hillis SL. Norms and Nurse Management of Conflicts: Keys to Understanding Nurse-Physician Collaboration. *Research in Nursing and Health*. 1998 Feb; 21:59-72.
20. Page AEK. Transforming Nurses Work Environments to Improve Patient Safety: The Institute of Medicine Recommendations. *Policy, Politics, & Nursing Practice*. 2004;5:250-258.
21. Clancy CM. TeamSTEPPS: Optimizing Teamwork in the Perioperative Setting. *AORN Journal*. 2007 Jul; 86:18-22.
22. O'Leary KJ, Thompson JA, Landler MP, et al. Patterns of Nurse-Physician Communication and Agreement on the Plan of Care. *Qual Saf Health Care*. 2010 Jun; 19:195-9.
23. Morey JC, Simon R, Jay GD, et al. Error Reduction and Performance Improvement in the Emergency Department Through Formal Teamwork Training: Evaluation Results of the MedTeams Project. *Health Services Research*. 2002 Dec; 37:1553-81.
24. Baker DP, Amodeo AM, Krokos KJ, Slonim A, Herrera H. Assessing Teamwork Attitudes in Healthcare: Development of the TeamSTEPPS Teamwork Attitudes Questionnaire. *Qual Saf Health Care*. 2010 Dec; 19:e49.
25. King HB, Battles J, Baker DP, et al. TeamSTEPPS: Team Strategies and Tools to Enhance Performance and Patient Safety. 2008 Aug. In K. Henriksen, J.B. Battles, M.A. Keyes, & M.L. Grady (Editors), *Advances in Patient Safety: New Directions and Alternative Approaches*. Vol. 3: Performance and Tools. Rockville, MD: Agency for Healthcare Research and Quality.
26. Agency for Healthcare Research and Quality. About TeamSTEPPS®. [Web Page]. n.d. Available at: [http://teamstepps.ahrq.gov/about-2cl\\_3.htm](http://teamstepps.ahrq.gov/about-2cl_3.htm). Accessed April 5, 2011.
27. Ferguson SL. TeamSTEPPS: Integrating Teamwork Principles into Adult Health/Medical-Surgical Practice. *Medsurg Nursing*. 2008 Apr; 17:122-5.
28. Clancy CM, Tornberg DN. TeamSTEPPS: Assuring Optimal Teamwork in Clinical Settings. *American Journal of Medical Quality*. 2007 May-Jun; 22:214-7.

29. Agency for Healthcare Research and Quality. TeamSTEPPS® Instructor Guide: Specialty Scenarios. [Web Page]. n.d. Available at: <http://www.ahrq.gov/teamstepstools/instructor/scenarios/contents.htm>. Accessed April 5, 2011.
30. Agency for Healthcare Research and Quality. TeamSTEPPS® Home. [Web Page]. n.d. Available at: <http://teamstepps.ahrq.gov/>. Accessed April 5, 2011.
31. Zeltser MV, Nash DB. Approaching the Evidence Basis for Aviation-Derived Teamwork Training in Medicine. *American Journal of Medical Quality*. 2010 Jan-Feb; 25:13-23.
32. Weaver SJ, Rosen MA, DiazGranados D, et al. Does Teamwork Improve Performance in the Operating Room? A Multilevel Evaluation. *Jt Comm J Qual Patient Saf*. 2010 Mar; 36:133-42.
33. Stead K, Kumar S, Schultz TJ, et al. Teams Communicating Through STEPPS. *Medical Journal of Australia*. 2009 Jun 1; 190:S128-32.
34. Cima RR, Kollengode A, Storsveen AS, et al. A Multidisciplinary Team Approach to Retained Foreign Objects. *Jt Comm J Qual Patient Saf*. 2009 Mar; 35:123-32.
35. Awad SS, Fagan SP, Bellows C, et al. Bridging the Communication Gap in the Operating Room With Medical Team Training. *American Journal of Surgery*. 2005 Nov; 190:770-4.
36. Gore DC, Powell JM, Baer JG, et al. Crew Resource Management Improved Perception of Patient Safety in the Operating Room. *American Journal of Medical Quality*. 2010 Jan-Feb; 25:60-3.
37. Haig KM, Sutton S, Whittington J. SBAR: a Shared Mental Model for Improving Communication Between Clinicians. *Jt Comm J Qual Patient Saf*. 2006 Mar; 32:167-75.
38. Mann S, Marcus R, Sachs B. Grand Rounds: Lessons From the Cockpit: How Team Training Can Reduce Errors on L&D. *Contemporary OB/GYN*. 2006; 51:34.
39. Pronovost P, Berenholtz S, Dorman T, et al. Improving Communication in the ICU Using Daily Goals. *Journal of Critical Care*. 2003 Jun; 18:71-5.
40. Anderson JF. Rural Hospitals and the “5 Million Lives Campaign”. Catholic Health Initiatives Is Encouraging Its Smaller Facilities to Join a Patient-Safety Effort. *Health Progress*. 2007 Nov-Dec; 88:48-52.
41. Coburn AF, Wakefield M, Casey M, et al. Assuring Rural Hospital Patient Safety: What Should Be the Priorities? *Journal of Rural Health*. 2004 Fall; 20:314-26.
42. Tupper J, Coburn A, Loux S, et al. Strategies for improving patient safety in small rural hospitals. In: Henriksen K, Battles JB, Keyes MA, Grady ML, Editors. *Advances in Patient Safety: New Directions and Alternative Approaches*. Vol. 2. *Culture and Redesign*. Rockville, MD: Agency for Healthcare Research and Quality; 2008:303-313.

43. Hansen KS, Uggen PE, Brattebo G, Wisborg T. Team-Oriented Training for Damage Control Surgery in Rural Trauma: a New Paradigm. *Journal of Trauma*. 2008 Apr; 64:949-53; discussion 953-4.
44. Berg BW, Sampaga A, Garshnek V, Hara KM, Phrampus PA. Simulation Crisis Team Training Effect on Rural Hospital Safety Climate (SimCritic). *Hawaii Medical Journal*. 2009Nov; 68:253-5.
45. Moscovice, I, Davidson, G. *Rural Hospitals: New Millennium and New Challenges*. Minneapolis, MN: University of Minnesota, School of Public Health, Division of Health Services Research and Policy, Rural Health Research Center; February 2003.
46. Klingner J, Moscovice I, Tupper J, Coburn A, Wakefield M. Implementing Patient Safety Initiatives in Rural Hospitals. *Journal of Rural Health*. 2009, Fall; 25:352-357.
47. Longo DR, Hewett JE, Ge B, Schubert S. Rural Hospital Patient Safety Systems Implementation in Two States. *Journal of Rural Health*. 2007 Summer; 23:189-97.
48. Jones K. *National Implementation of TeamSTEPPS Webinar 5: TeamSTEPPS and Critical Access Hospitals*. Webinar presented for the Agency for Healthcare Research and Quality; 2008 Oct 29; Rockville, MD.
49. McEllistrem-Evenson A. Quality Collaboration: TeamSTEPPS Program Emphasizes Teamwork on Many Levels. *Health Workforce News*. 2010 May.
50. The Nebraska Center for Rural Health Research. Rural Hospital Survey on Patient Safety Culture. [Web Page]. n.d. Available at: <http://www.unmc.edu/rural/patient-safety/culture%20survey/AHRQ%20HSOPSC%20Rural%201107.pdf>. Accessed April 5, 2011.
51. National Rural Health Resource Center. Iowa Flex State Profile. [Web Page]. n.d. Available at: <http://www.ruralcenter.org/tasc/flexprofile/2011/iowa>. Accessed May 7, 2011.

## Additional Resources and Tools

### *Team Training in Health Care: Systematic Reviews*

Salas E, DiazGranados D, Weaver SJ, King H. **Does Team Training Work? Principles for Health Care.** *Acad Emerg Med* 2008 Nov; 15:1002-9.

Rabol LI, Ostergaard D, Mogensen T. **Outcomes of Classroom-Based Team Training Interventions for Multiprofessional Hospital Staff.** A Systematic Review. *Qual Saf Health Care* 2010 Dec; 19:e27.

McCulloch P, Rathbone J, Catchpole K. **Interventions to Improve Teamwork and Communications among Healthcare Staff.** *Br J Surg* 2011, Feb 8.

### *Interprofessional Health Education*

**Health Professions Education: A Bridge to Quality,** 2003. Institute of Medicine.

**Leadership in Interprofessional Health Education and Practice.** By Charlotte Brasic Royeen, Gail M. Jensen, & Robin Ann Harvan. Jones and Bartlett Publishers, 2009.

**Team-Based Care Takes Training: The Push for Interprofessional Education.** National Health Policy Forum, June 17, 2011.

Interprofessional Education Collaborative (IPEC) is a unique partnership of six associations—the American Association of Colleges of Nursing, the American Association of Colleges of Osteopathic Medicine, the American Association of Colleges of Pharmacy, the American Dental Education Association, the Association of American Medical Colleges, and the Association of Schools of Public Health.

On May 10, 2011, Mary Wakefield, PhD, RN, Administrator, Health Resources and Services Administration (HRSA), joined leaders from IPEC, and representatives from the Josiah Macy Jr. Foundation, the Robert Wood Johnson Foundation, and the ABIM Foundation to announce the release of core competencies for interprofessional education in the health professions, and action strategies to implement the new competencies.

The following reports are highlighted in this announcement:

- **Team-Based Competencies: Building a Shared Foundation for Education and Clinical Practice.**
- **Core Competencies for Interprofessional Collaborative Practice**