



Advancing Health in America

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Advancing Team-based Health Care: Lessons Following the COVID-19 Pandemic



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Executive Summary

The Centers for Disease Control and Prevention (CDC) launched Project Firstline to address existing gaps in infection prevention and control (IPC) practices and ensure that all health care workers and allied health professionals nationwide have access to relevant IPC education. Understanding that effective IPC is a “team sport,” the American Hospital Association (AHA) partnered with NORC at the University of Chicago as part of this initiative to investigate how team-based care (TBC) contributes to IPC and how it has evolved during the COVID-19 pandemic. As organizations navigate a world of contract labor, fluid workforce and disrupted workflows, they must carefully consider how they train, onboard and deploy staff to ensure that staff members can collaborate effectively. This paper is designed to: summarize the review of the literature and the input gathered from focus groups of health system leaders and offer a range of recommendations aimed at hospitals, educational institutions, governmental organizations and national organizations to support the advancement of TBC to improve patient safety. The recommendations are multifaceted and are explored in detail in this paper.

Figure 1: Summary of Recommendations



Introduction

In 2020, the Centers for Disease Control and Prevention (CDC) launched Project Firstline, a collaborative of diverse health care and public health partners that aims to provide engaging, innovative and effective infection control trainings for millions of front-line U.S. health care workers, as well as members of the public health workforce.¹ As part of Project Firstline, the CDC, in partnership with the American Hospital Association (AHA) and the League for Innovation in the Community College, implemented the Community College Collaborative to enhance infection control content in community colleges' existing curricula and to advance future health care workers' knowledge and practice of infection prevention.

The COVID-19 pandemic introduced many challenges to the health care system and the ways care teams coordinate to manage infection prevention. Infection prevention and control (IPC) is an area of care delivery that is often described as a “team sport.” Therefore, it is not surprising that team-based care (TBC) was reinforced throughout the pandemic to mitigate IPC challenges. As this paper will show, there are many conceptualizations of TBC. We think of TBC as “the provision of health services to individuals, families, and/or their communities by at least two health care providers who work collaboratively with patients and their caregivers — to the extent preferred by each patient — to accomplish shared goals within and across settings that result in coordinated, high-quality care.”² To better support hospitals in their response to the COVID-19 pandemic, the AHA was interested in understanding team-based models of care in acute-care hospitals leading up to 2020 and how organizations have shifted their thinking since then. Specifically, the AHA sought to better understand how IPC can be supported and improved by team-based models of care. Additionally, these learnings and recommendations can then inform and guide community colleges and other training environments to better support students who will be entering the health care workforce in TBC skills.

The AHA partnered with NORC at the University of Chicago (“NORC”) and provided guidance, oversight and support in conducting a two-part research study consisting of 1) an in-depth environmental scan and 2) focus groups with hospital leaders. This research examined how TBC is practiced, the impact of the pandemic on TBC, strategies used to build a team-based culture in health care and how TBC enables IPC.

Background

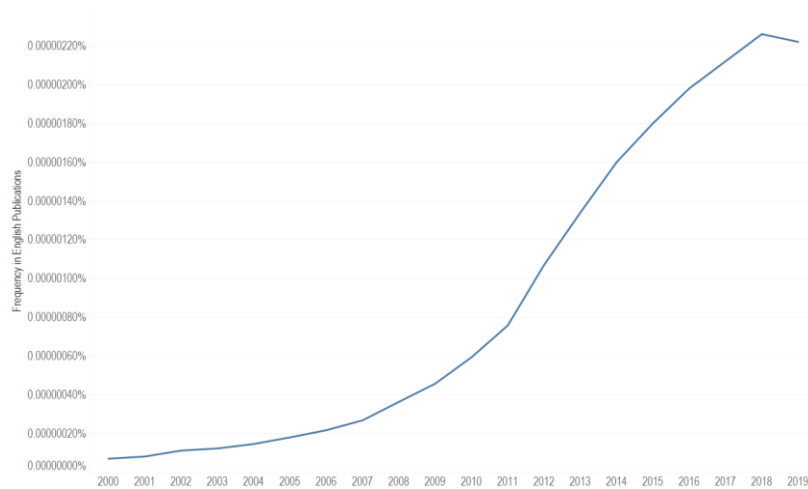
The term “team-based care” was coined in the late 1990s,³ and the term became more popular in the 2010s, as shown in Figure 2.

¹ Centers for Disease Control and Prevention. (n.d.). Project Firstline; CDC's National Training Collaborative for Healthcare Infection Control. Department of Health and Human Services. Available at: <https://www.cdc.gov/infectioncontrol/pdf/projectfirstline/PFL-FactSheet-508.pdf>.

² Mitchell P, Wynia M, Golden R, et al. Core principles & values of effective team-based health care, 2012. Washington, DC: Institute of Medicine. Available at: <https://nam.edu/wp-content/uploads/2015/06/VSRT-Team-Based-Care-Principles-Values.pdf>.

³ Hupke C; Institute for Health Care Improvement. Team-based care: optimizing primary care for patients and providers. 2014. Available at: <https://www.ihc.org/communities/blogs/team-based-care-optimizing-primary-care-for-patients-and-providers-#:~:text=It%20started%20with%20the%20Chronic,to%20%E2%80%9Ceffective%20care%20teams.%E2%80%9D>.

Figure 2: Frequency of “Team-based Care” Found in Printed Sources



Source: Downloaded on 11/7/2022 from Google Ngram, an online search engine that charts the frequencies of any set of search strings using a yearly count of n-grams found in published printed sources.

TBC practices have been used in health care for many years, yet it has no universally accepted definition. At its core, TBC involves two or more health care professionals working together, but the lack of a universal definition reflects the diverse structures of TBC, including interdisciplinary, interprofessional and multidisciplinary TBC.

Relevance to Infection Prevention and Control

The COVID-19 pandemic challenged and, in many cases, upended traditional care delivery. Health care organizations and systems were forced to rapidly respond and adapt to COVID-19, blurring team boundaries and interrupting typical coordinating functions between team members. Furthermore, COVID-19 induced a stressful work environment and caused high rates of staff turnover, which in turn constrained team collaboration and trust.⁴

Infection preventionists have described how these factors have posed barriers to routine IPC, such as the inability to bring together staff members to conduct bedside rounds and falling compliance with IPC protocols.⁵ The impact was evident in the increased rates of infections such as catheter-associated urinary tract infections (CAUTIs), central-line-associated bloodstream infections (CLABSIs), ventilator-associated events, and Methicillin-resistant *Staphylococcus aureus* infections in the early stages of the pandemic.⁶ Higher infection rates during the pandemic underscore the importance of sustained team cohesion.

⁴ Ibid.

⁵ Rebmann T, Alvino R, Mazzara R, et al. Infection preventionists’ experiences during the first nine months of the COVID-19 pandemic: findings from focus groups conducted with Association of Professionals in Infection Control & Epidemiology (APIC) members. *Am J Infect Control*. 2021;49(9):1093-1098. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8387098/>.

⁶ Weiner-Lastinger LM, Pattabiraman V, Konnor RY, et al. The impact of coronavirus disease 2019 (COVID-19) on health care-associated infections in 2020: a summary of data reported to the National Healthcare Safety Network. *Infect Control Hosp Epidemiol*. 2022;43(1):12-25. Available at: <https://www.cambridge.org/core/journals/infection->

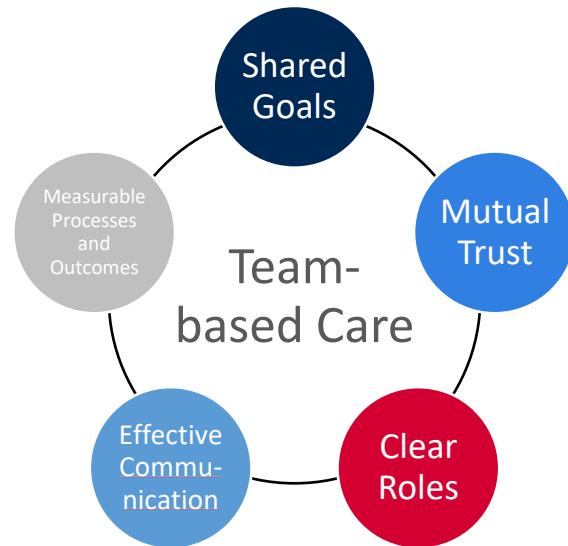
Findings

Defining “team-based care”

As detailed in the background section, the term “team-based care” came into popular usage in the 2010s. Although team-based care has been the focus of a great deal of literature, there is little agreement on a precise definition. The central element of the various ways in which “team-based care” is conceptualized is the bringing together of a group of health care workers with different roles and skillsets to coordinate patient care delivery.

The goals and models of TBC that appear across the literature are very broad, but there are some commonalities. We believe these common elements are most clearly captured in the Institute of Medicine’s (IOM) key principles of TBC (Figure 3): shared goals, mutual trust, clear roles, effective communication, and measurable processes and outcomes. Regardless of which roles are being brought together, we find that these five principles comprise a holistic definition of “team-based care.”

Figure 3: IOM Key Principles of Team-based Care



Existing Strategies to Build a Culture of TBC

[control-and-hospital-epidemiology/article/impact-of-coronavirus-disease-2019-covid19-on-healthcare-associated-infections-in-2020-a-summary-of-data-reported-to-the-national-healthcare-safety-network/8197F323F4840D233A0C62F4726287E1.](https://www.ahajournals.org/doi/full/10.1177/0898010122111111)

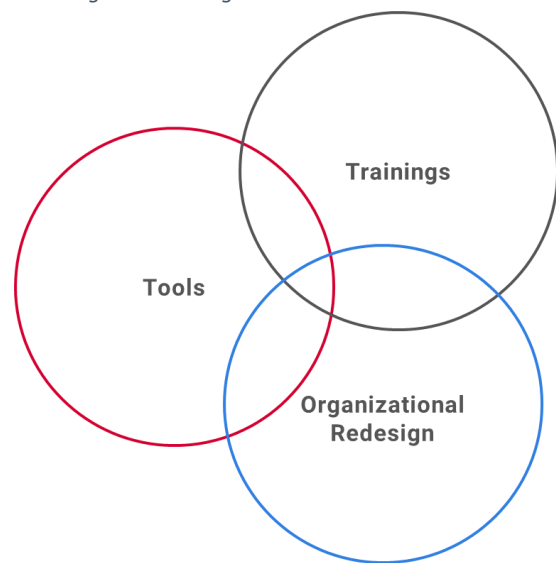
The literature highlighted three key pathways that organizations use to implement TBC (Figure 4). These include offering staff trainings on how to coordinate effectively under TBC models with which staff members may not be familiar, rolling out tools, such as technological adaptations that facilitate communication or improve the efficiency of a team's functioning, and redesigning team structures to foster new forms of collaboration that would not be possible under existing paradigms.

Trainings

Trainings educate team members on how to work together more effectively. Trainings can be grouped into 1) those based on predefined principles, 2) those organized around a particular methodology or 3) more general team trainings that incorporate a variety of approaches.⁷

TeamSTEPPS is an example of a principles-based training. It is a systematic approach developed by the U.S. Department of Defense and the Agency for Healthcare Research and Quality to integrate teamwork principles and skills into practice and is designed to improve the quality, safety and efficiency of health care.⁸ Rather than training staff members on a specific method or process, trainings like TeamSTEPPS focus on key principles for facilitating successful teamwork, such as how to effectively coach, what constitutes a good target outcome, how to manage change and how to communicate effectively. In its fundamentals curricula, TeamSTEPPS covers such principles as effective team structure, communication, team leadership, situation monitoring and mutual support.⁹ Principles-based trainings tend to be, by design, broadly applicable. Since its initiation in 2003,¹⁰ TeamSTEPPS has been practiced by a wide variety of teams within many different types of organizations to improve team-building capacity.¹¹

Figure 4: Strategies Used to Promote TBC



⁷ Buljac-Samardzic M, Doekhie KD, van Wijngaarden JDH. Interventions to improve team effectiveness within health care: a systematic review of the past decade. *Human Resource Health*. 2020;18(2):1-42. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6950792/>.

⁸ King HB, Battles J, Baker DP, et al. Agency for Healthcare Research and Quality. TeamSTEPPS™: team strategies and tools to enhance performance and patient safety. In: *Advances in Patient Safety: New Directions and Alternative Approaches* (vol. 3: Performance and Tools). 2008. Available at: <https://www.ncbi.nlm.nih.gov/books/NBK43686/>.

⁹ Agency for Healthcare Research and Quality. TeamSTEPPS 2.0 Fundamentals. Available at: <https://www.ahrq.gov/teamstepps/instructor/fundamentals/index.html>.

¹⁰ Ibid.

¹¹ Hill DJ; University at Buffalo. (2022). TeamSTEPPS training teaches health sciences students vital collaboration skills. Available at: <https://www.buffalo.edu/ubnow/stories/2022/03/ipe-team-stepps-training.html>.

Simulation-based trainings, an example of a training tied to a specific methodology, provide the opportunity to learn new skills, engage in deliberate practice and receive focused real-time feedback.¹² Simulation-based trainings aim to improve knowledge, skills and behaviors. Without the ability to bring learners into a live care setting during the pandemic, simulations proved to be a valuable tool to present learners with a similar situation in a controlled environment. The goal of simulation-based training is to enable the accelerated development of expertise, in both individuals and teams, by bridging the gap between classroom training and real-world clinical experiences in a relatively risk-free environment.¹³

*The Department of Health and Human Services (HHS) has developed “Partnering to Heal,” a simulation-based training aimed at improving IPC. The training promotes teamwork; communication; handwashing; vaccination against the flu; appropriate use of antibiotics; and proper insertion, maintenance and removal of devices such as catheters and ventilators.*¹⁴

Despite their value, trainings that rely on a particular method tend to have blind spots as well. Focus group participants stressed that simulation training is valuable but is not yet as effective as in-person training to teach teamwork and communication skills.

Tools

As described by Buljac-Samardzic and colleagues, tools are “instruments that are introduced to improve teamwork by structuring, ... facilitating ... or triggering ... team interaction.” Structuring tools partially standardize the processes of team interaction. “Facilitating tools provide better opportunities for team interaction,” whereas “[t]riggering tools provide information to incentivize team interaction.”¹⁵ Common examples of tools used to promote TBC include team huddles, rounds, and briefing and debriefing. Focus group participants shared tools that were not frequently mentioned in the literature, such as standardized templates (e.g., for communicating), applications-enabled IPC checklists and technical devices such as automated sensor systems for handwashing audits.

Huddles and rounds, both used in TeamSTEPPS, are common tools used to facilitate communication within a health care team. The purpose of a huddle is to share information and highlight concerns, which are then ideally directed to the appropriate person or group for resolution.¹⁶ When used consistently, huddles are an effective and efficient way for health care teams to share information, review their

¹² Agency for Healthcare Research and Quality; Patient Safety Network. (2019). Simulation training. Available at: <https://psnet.ahrq.gov/primer/simulation-training>.

¹³ Ibid.

¹⁴ U.S. Department of Health and Human Services. (n.d.). Partnering to heal. Available at: <https://health.gov/about-odphp/trainings/partnering-heal>.

¹⁵ Buljac-Samardzic M, Doekhie KD, van Wijngaarden JD. Interventions to improve team effectiveness within health care: a systematic review of the past decade. *Human Resource Health*. 2020;18(1):1-42. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6950792/>.

¹⁶ Shaikh U; Agency for Healthcare Research and Quality; Patient Safety Network. Improving patient safety and team communication through daily huddles. Jan. 2020. Available at: <https://psnet.ahrq.gov/primer/improving-patient-safety-and-team-communication-through-daily-huddles>.

performance, proactively flag safety concerns, increase accountability and ensure that interventions are hardwired into the system.¹⁷

Many focus group participants noted that their organizations used huddles as a strategy to promote TBC. A director of clinical operations and a director of nursing from separate Midwestern health systems used a tiered huddle structure to facilitate TBC. The tiered huddle structure uses six tiers to share information and address problems at all levels of the organization — from caregivers to the health system executive team.¹⁸ The mid-sized hospital in the Midwest to which the director of nursing belonged exemplified the tiered huddle system's ability to close communication gaps: "By 10:30 a.m. our senior executive leadership know if there are any concerns across the enterprise that they are able to address."

Like huddles, team rounding facilitates patient-centered communication at the bedside. Having been used for many years, team rounding allows members from various disciplines to come together to

Rounding as a Communication Tool

"During the height of the pandemic, they [IP nurses] made daily rounds on the unit just to support the team. They did multiple sessions on how to appropriately don and doff their PPE, and they would watch people do it and they would say, 'you didn't do this correctly, let's try again.'"

– Director of nursing at a Midwestern hospital

coordinate patient care, determine care priorities, establish daily goals and plan for potential transfer or discharge.¹⁹ Focus groups revealed that most participants' organizations used rounding. Rounds occur in the presence of the patient and may consist of the primary nurse, physicians, charge nurse, case manager, social worker, physical therapist, pharmacist, patient family members and a patient advocate, as needed. Focus group participants expressed that these rounds are only as valuable as the variety of the team members who participate in them. Broad participation is key to maximizing the value of rounds as a forum for communicating.

Tools less frequently mentioned in the literature, but shared by focus group participants, included standardized templates and technical solutions.

A program analyst of a federal health system stated that their organization used a standardized note-taking template, which helped facilitate rapid and structured communication of patient safety issues and information sharing between shifts.

Participants were split in their perceptions of technology to facilitate communication, and the degree of technical sophistication varied across organizations. Some focus group participants mentioned the adoption of simple technical solutions such as Microsoft Teams and spreadsheets. One focus group participant noted their organization's implementation of artificial intelligence (AI) solutions to speed communication with less effort from staff members and to improve workflow efficiency.

¹⁷ Ibid.

¹⁸ Mihaljevic T. Tiered daily huddles: the power of teamwork in managing large health care organizations. *BMJ Qual Saf.* 2020;29(12):1050-1052.

¹⁹ Institute for Healthcare Improvement. How-to guide: multidisciplinary rounds. Cambridge, Mass.: February 2015. Available at: <https://www.ihl.org/resources/Pages/Tools/HowtoGuideMultidisciplinaryRounds.aspx>.

Focus group participants expressed multiple viewpoints when talking about modes of communication — such as text messaging and chat features within Epic, an electronic health record (EHR) system, or Microsoft Teams — that have not previously been widely used in health care. On the one hand, many participants noted the importance of maintaining face-to-face communication, which allows the team “to develop relationships, talk to providers, convey the urgency of a situation, and, at the same time, get to know who we are and get to know our vulnerabilities.” On the other hand, some stressed generational differences in communication preferences, with younger staff members gravitating to text and chat and more experienced staff members gravitating to face-to-face or phone-based communication.

Some focus group participants reported using shared spreadsheets accessible to all members of the team to monitor patient health outcomes, track personal protective equipment (PPE) inventory, and track COVID-19 positive patients and staff. As the COVID-19 pandemic introduced challenges in coordinating care across teams and units, clinical staff found shared spreadsheets quite useful and easy to implement without help from health information technology teams. Another participant mentioned using artificial intelligence, a more advanced technical solution, to improve workflow efficiency.

This respondent, a chief medical and sciences officer of a multisite health system, shared their experiences with streamlining patient safety audits. Their organization implemented a pilot program that used digital sensors to monitor handwashing rather than having a staff member monitor the skill, thereby reducing the labor burden in conducting audits.

Despite many new technologies, many focus group participants reported that their hospitals still rely heavily on traditional tools such as whiteboards and paper scheduling to facilitate communication. These types of tools will likely remain valuable to staff, and some participants thought that they were more efficient in enabling clinical workflows.

Organizational (Re)design

Organizational redesign refers to changing processes, such as schedules or team composition or introducing/updating roles to improve processes. Focus group participants cited using a plethora of organizational changes to facilitate teamwork, including committees, shared governance models and flexible work schedules. Some participants mentioned movement toward either becoming high reliability organizations (HROs)²⁰ or embodying HRO principles within their organizations as a mechanism to promote TBC. Specifically, participants shared that psychologically safe environments, a central feature of HROs, encourage team members to speak up, ask questions, share ideas and express concerns, thereby helping to facilitate trust and communication within a team.

Reducing the Power Gradient to Enable Communication

“It’s easier to say, ‘Doc, wash your hands,’ [and] reducing the power gradient allowed us to hold each other to those levels.”

– Market director of clinical operations at a Midwestern hospital system

²⁰ HROs are organizations that operate in complex, high-hazard domains for extended periods without serious accidents or catastrophic failures. High reliability is described as a condition of persistent mindfulness within an organization, and HROs cultivate resilience by relentlessly prioritizing safety over the performance pressure. From <https://psnet.ahrq.gov/primer/high-reliability>.

Committees, i.e., groups of health care professionals that regularly meet to discuss a designated topic, were used by a handful of focus group participants to promote TBC. Committees were also helpful in promoting infection prevention across organizations.

The system chief clinical officer of a Midwestern hospital system shared their organization's success story: "Rather than having different committees that were vertically organized, we created one place to begin to have people see the interconnection between preventing CAUTI and preventing CLABSI. It's not that different ... so why do you need to talk about it differently? Why not talk about it together, and so that has given us speed [and] an ability to share across the pavilions."

In addition to committees, shared governance, wherein decision-making authority is vested in the team, was used to facilitate teamwork within hospital units. Shared governance provided a structure for staff members to come together, make decisions and improve processes within their units.

A clinical director of a Southwestern hospital shared that their organization "has a huge focus on shared governance" to discuss IP and patient safety, but they are "changing [their] shared governance to focus on the problem as a whole and not so much as this specific infection [they] are trying to address." A nurse manager at an academic medical center in the Southeast indicated that their organization also used shared governance meetings to ensure that the facility was meeting metrics goals. Participants engaged leaders to help solve problems when facilities were underperforming.

Lastly, hospitals reported experimenting with a wide range of solutions to simultaneously improve staff well-being and communication.

An associate director at an academic teaching facility in the mid-Atlantic region shared benefits of moving to a four-day workweek to promote a sense of mental well-being among staff members. This change enabled staff members to avoid burnout, and the lower frequency of handoffs encouraged more robust communication.

Current State of U.S. Team-based Staffing Models

The onset of the COVID-19 pandemic challenged traditional TBC processes and practices, exacerbated workforce shortages, introduced dramatic supply chain disruption and increased the use of telemedicine. Many organizations had to quickly adapt and find solutions to meet the unprecedented demands introduced by COVID-19. For example, Kaiser Permanente embraced several new strategies to treat the influx of patients, such as repurposing offices and conference rooms into hospital bed space, shifting care to nontraditional facilities and expanding telehealth capacity.²¹ The Centers for Medicare & Medicaid Services (CMS) helped to enable these types of adaptations more broadly by temporarily waiving many requirements for health care providers and regulations regarding sites of care.²²

Focus group participants differed in the levels of TBC they utilized in their organizations, with some stressing their use of interprofessional TBC and other participant organizations still largely operating in silos. Even those who made great strides in enhancing coordination prior to the pandemic often focused

²¹ Kaiser Permanente. (n.d.). The COVID-19 pandemic in 2020. Available at: <https://about.kaiserpermanente.org/who-we-are/annual-reports/the-covid-19-pandemic-in-2020>.

²²Centers for Medicare & Medicaid Services. Coronavirus waivers & flexibilities. Available at: <https://www.cms.gov/coronavirus-waivers>.

on coordination across roles within the same unit. This on-the-ground coordination rarely traveled up to the executive or leadership levels or across units. With the rapid onset of the pandemic, hospital and health system leaders quickly realized the importance of interprofessional collaborations within and across units.

We heard testimony on pandemic-induced de-siloing from one of the focus group participants, a vice president of infection prevention at a large health care system composed of long-term acute care hospitals and rehabilitation hospitals. Prior to the pandemic, the two groups of hospitals rarely communicated with each other, but the pandemic forced the rehabilitation division to adopt IP practices from the clinical division. To date, this executive continues to communicate with colleagues with whom they did not interact before the pandemic.

Apart from these difficulties with interprofessional collaboration, the pandemic further strained teams due to an ongoing shortage of health care workers. Care models evolved to respond to the shortages of physicians, nurse practitioners, physician assistants and other key roles, which meant getting creative with roles and responsibilities within each professional's scope of practice. For example, to free up physicians' time, pharmacy teams assisted with medication reconciliations, and nonclinical staff did what they could to help patients navigate their care journey.²³

A nurse manager of a midsized hospital system described how their facility utilized staff members from units that were shut down, such as many operating rooms, to augment the critical care teams. Despite their lack of critical care training, these staff members were able to perform supporting roles such as tracking patient vitals, performing safety checks and changing wound dressing.²⁴ This allowed trained critical care staff members to focus on tasks where their expertise was crucial.

Challenges

The environmental scan and focus groups revealed both strategies that enable or promote TBC, but also challenges that limit its implementation. Challenges shared by focus group participants spanned the pre-pandemic and pandemic eras. Issues with EHRs surfaced as a barrier in implementing TBC prior to the pandemic while workforce challenges and inconsistent guidance from governmental organizations arose as obstacles in facilitating TBC during the pandemic.

There was a general perception among focus group participants that EHRs are not always the best tool to enable communication. EHRs were designed to meet documentation guidelines for CMS billing,²⁵ not to facilitate communication across health care teams and coordinate patient care. However, many organizations have tailored their EHR systems to support workflows, including by presenting holistic patient information and allowing for efficient communication. For example, some participants observed

²³ Duffey K, Prewitt E. Addressing health care workforce shortages. *NEJM Catalyst*. 2022. Available at: <https://catalyst.nejm.org/doi/full/10.1056/CAT.22.0031>.

²⁴ Society of Critical Care Medicine. Nursing staff models; ICU staffing plan: contingency & crisis model (v 2.12/17/2020). Available at: <https://www.sccm.org/getattachment/b5003fa2-297f-4c23-9483-c637dfc535da/Nursing-Staffing-Models-ICU-Staffing-Plan-Contin>.

²⁵ Smith CD, Balatbat C, Corbridge S, et al.; National Academy of Medicine. Implementing optimal team-based care to reduce clinician burnout. *NAM Perspectives*. 2018. Available at: <https://nam.edu/implementing-optimal-team-based-care-to-reduce-clinician-burnout/>.

that Epic Chat, although not the solution they used originally, is now used by their hospitals to enable ad hoc communications. On the other hand, a program analyst for a federal health system shared that they “[didn’t] know if the EHR is set up to support us,” indicating that organizations that want to use their EHR systems as a forum for staff communication must take deliberate steps in its implementation to ensure that its design supports the team’s workflow.

Onboarding traveling nurses proved challenging for focus group participants, with a nurse manager at an academic medical center in the Southeast remarking, “We have a lot of travelers that we have to house, and we have to keep [our standards and practices] simple.” Turnover and its association with stress and burnout were explored in a survey of more than 20,000 health care workers conducted from July to December 2020.²⁶ The survey found that a large proportion of health care workers spanning different roles have experienced burnout, depression and other stress factors and that these factors are associated with intent to leave and intent to reduce work hours. Focus group participants commented on the cyclical nature of these two sets of issues in that staff attrition leads to staffing shortages and higher workloads, which in turn exacerbate the underlying stress among staff members.

Even before the pandemic, burnout, exhaustion, moral injury and mental health concerns were known to occur at higher rates for many health care workers than for the general public.²⁷ The National Academy of Medicine (NAM), which organized stakeholders to study and address burnout, estimated that, prior to the pandemic “between 35 and 54 percent of U.S. nurses and physicians [had] substantial symptoms of burnout.”²⁸ The COVID-19 pandemic placed additional stress on an already burdened workforce, compounding feelings of stress, exhaustion, burnout and trauma.

A 2021 study found that approximately 22% of health care workers reported moderate depression or post-traumatic stress disorder (PTSD) during the pandemic.²⁹ One focus group participant, the director of nursing at a Midwestern hospital, echoed these issues, expressing serious concerns about underacknowledged PTSD and other trauma responses among staff members. Other members of the group concurred.

Key Competencies of TBC

In 2011, the Interprofessional Education Collaborative (IPEC) defined four domains of core interprofessional practice competencies: 1) values/ethics, 2) roles/responsibilities, 3) communication and 4) teamwork/TBC (Appendix Table 4). These core competencies closely align with the key

²⁶ Sinsky CA, Brown RL, Stillman MJ, Linzer M. COVID-related stress and work intentions in a sample of US health care workers. *Mayo Clin Proc Innov Qual Outcomes*. 2021;5(6):1165-1173. Available at: [https://www.mcpiqjournal.org/article/S2542-4548\(21\)00126-0/fulltext](https://www.mcpiqjournal.org/article/S2542-4548(21)00126-0/fulltext).

²⁷ Office of the Assistant Secretary for Planning and Evaluation. Impact of the COVID-19 pandemic on the hospital and outpatient clinician workforce: challenges and policy responses (Issue Brief HP-2022-13). May 2022. Available at: <https://aspe.hhs.gov/sites/default/files/documents/9cc72124abd9ea25d58a22c7692dccb6/aspe-covid-workforce-report.pdf>.

²⁸ National Academy of Medicine Taking action against clinician burnout: a systems approach to professional well-being (2019). Available at: <https://www.nap.edu/catalog/25521/taking-action-against-clinician-burnout-a-systems-approach-to-professional>.

²⁹ Kuehn BM. New plans focus on health care workers’ mental health. *JAMA*. 2021;326(24):2465-2465.

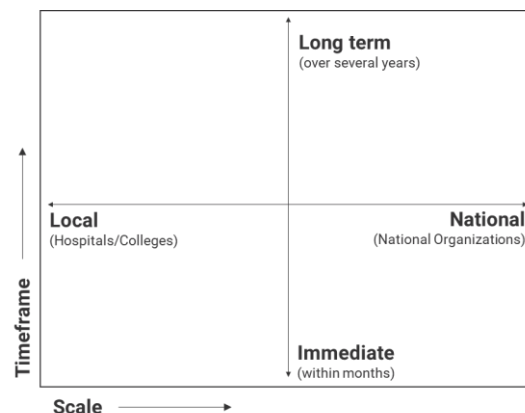
competencies that focus group participants reported wanting new staff members entering the workforce to have. Specifically, participants stressed their desire for competencies aligned with IPEC's communication domain, such as the ability to work and communicate in teams, communicate in high-pressure scenarios, advocate for patients and use motivational interviewing skills.

Other desired competencies shared by focus group respondents included self-awareness, ability to understand one's role within the team, confidence, basic hygiene skills, collaborative skills and ability to adapt to new learnings and technologies. There was also broad agreement that training programs focus too much on the clinical aspects of patient care and not enough on the mechanics of being part of a care team.

Recommendations

Based on the information gathered from our literature review and focus groups, we developed a set of recommendations to improve team-based care. Our recommendations range from smaller-scale actions that can be implemented by hospitals and/or colleges to larger-scale solutions that national organizations can pursue through provision of policy, guidance and funding. Based on the aims of this research and the topics that emerged repeatedly from the focus groups, these recommendations are organized into the following overarching themes: 1) mental health and well-being, 2) technology, 3) training and education and 4) organizational change. As illustrated in Figure 5, we have categorized each recommendation based on two dimensions: 1) our estimated timeframe³⁰ for how quickly the recommendations can be implemented (immediate, medium- and long-term) and 2) the scale³¹ at which we think the solution should be implemented (local/hospital, state and/or national level).

Figure 5: Categorization of Recommendations



1. Mental Health and Well-being

As outlined in our findings, mental health and well-being are essential to individual and team performance. In the short run, it is imperative that mental health be addressed at every level of health care, particularly in acknowledging post-traumatic stress, and mental health care funding and access for clinical staff members be available.

³⁰ Timeframe is defined as the time in which the benefits of the recommendation will materialize and has been divided into immediate, medium- and long-term solutions. An immediate solution is one that addresses the immediate problem, whereas a long-term solution aims to resolve the underlying cause of a problem.

³¹ A recommendation at the micro level can be applied at the hospital and/or college level, whereas a macro-level solution may require national coordination. Immediate recommendations can be implemented without the need for infrastructure or changes in policy, whereas long-term recommendations require coordination among state and national organizations and governments.

Recommendation #1

Acknowledge and address pandemic post-traumatic stress across all levels of the health care field

Timeframe

Immediate

Scale

Local, state, national

The systemic acknowledgement of the trauma faced by health care workers is a precondition for solutions to address it. The findings from the current research support several of the recommendations in NAM’s National Plan for Health Workforce Well-Being and suggest that more must be done to address these challenges. Specifically, as the health care system transitions back to business as usual, leadership must focus on building a culture in which listening to health workers is a priority. Whether it be listening for signs and symptoms of trauma or enabling participatory management to improve patient safety, health care leaders should create a “workplace that cultivates relationships and uses open communication.”³² Quality continues to be a critical focus, but both internal and external hospital leaders should acknowledge the injuries and fatigue experienced by health care workers when enabling quality improvement programs or introducing new initiatives. Although COVID-19 hospitalizations have decreased substantially, health care workers are still trying to recover physically, emotionally and mentally, and achieving quality improvement goals must be cognizant of these challenges.

Recommendation #2

Commit additional funding to support employees’ return to physical and mental health

Timeframe

Immediate

Scale

State, national

Hospitals are experiencing financial strain as federal public relief funds for providers continue to wind down or no longer exist for some hospitals, staffing costs remain high and revenue growth remains slow.³³ Labor shortages can limit hospital capacity and present barriers to TBC and patient safety. The ripple effects of the pandemic will continue to be felt by both those providing care and those needing care. With recent increases in cases of respiratory syncytial virus (RSV) and ongoing risks of COVID-19, public health demands on the health system continue, and it is just as critical that hospitals have strong workforces today as it was in the early days of the pandemic. National organizations can advocate for the continuation of funding and additional resources to aid health care facilities and their workforces.

Recommendation #3

Reduce barriers to mental health care access

Timeframe

Medium term

Scale

Local

³² Addressing Health Worker Burnout: The U.S. Surgeon General’s Advisory on Building a Thriving Health Workforce (2022). Available at: <https://www.hhs.gov/sites/default/files/health-worker-wellbeing-advisory.pdf>.

³³ Swanson E; Kaufman Hall. National hospital flash report: October 2022. Available at <https://www.kaufmanhall.com/insights/research-report/national-hospital-flash-report-october-2022>.

The director of nursing at a rural Midwestern critical access hospital stressed, “Employee assistance programs are not enough anymore. We are going to need additional resources for our staff.” At a time when patients are experiencing shortages of mental health care providers, health workers are competing for access to the same mental health providers as everyone else, despite their regular proximity to providers. Insurers, providers and employers must collaborate to identify ways of reducing barriers to mental health care for health workers and develop processes to better triage health care workers who are struggling. Complementing many recommendations laid out by the AHA in its report “[Strengthening the Health Care Workforce: Strategies for Now, Near and Far](#),” we recommend the following:

- On-site mental health resources and programs — from dedicated counselors to programs aiming to foster a wider culture of workplace psychological safety — should be made available to staff.
- When on-site resources or telehealth are not feasible, processes should be established to connect health workers with the mental health support resources they need.

2. Technological

Novel technologies have impacted nearly all processes and practices within the health care field. EHRs replaced paper records, telemedicine allowed patients to receive care from the safety and comfort of their homes, particularly during the pandemic, and, in some instances, AI has replaced humans in performing administrative activities. Although there are issues associated with the use of technology in health care, it can improve health care management, connect patients and their health care professionals and lower costs.³⁴ Several focus group participants agreed that improving interoperability, developing new norms in how communications tools are used in the clinical context and ensuring that technologies do not worsen well-being are all critical.

<p>Recommendation #4</p> <p>Improve interoperability between EHR vendors</p>	<p><u>Timeframe</u></p> <p>Long term</p> <p><u>Scale</u></p> <p>National</p>
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The EHR adoption rate by hospitals is nearly complete, with 96% having a federally tested and certified EHR program, and 80% of office-based physicians have a certified EHR system.³⁵ However, as of 2015, only 6% of health care providers could share patient data with other clinicians who use an EHR system different from their own. Despite these challenges within and beyond the four walls of hospitals, EHRs remain one of the most promising technologies for communicating between providers. The market director of clinical operations at a Midwestern hospital system suggested that national organizations push for enhanced interoperability

³⁴ Galen Data. The disadvantages of technology in health care. 2019. Available at: <https://www.galendata.com/disadvantages-of-technology-in-healthcare/>.

³⁵ Reisman M. EHRs: the challenge of making electronic data usable and interoperable. *P T*. 2017;42(9):572-575. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5565131/>.

between different EHR vendors. Interoperability³⁶ is a challenging goal to achieve, but national organizations should continue to encourage vendors to support it due to the increasing scale and complexity of health care providers' communication and information-sharing needs.

Recommendation #5

Enable norms that guide health care on the use of different communication tools within the clinical context

Timeframe

Immediate

Scale

Local, national

Many focus group participants noted that health care workers embraced texting during the pandemic as a means of easing communication. However, most participants stressed the challenges of conducting critical conversations by text messaging and chat rather than through spoken modalities. Some participants noted the proliferation of text message/chat lingo or acronyms that are starting to be used in EHRs, resulting in increased risk of miscommunication. In short, norms for how texting and chat should be used in the clinical context should be established to ensure that caregivers understand when texting/chat is appropriate, how to minimize the risk of miscommunication and when the risk to patient safety, privacy and quality of care outweighs the efficiency of quicker communication.

Recommendation #6

Focus on the care team's well-being with the introduction of technological advances

Timeframe

Immediate

Scale

Local, national

The pandemic and its after-effects have illustrated the pressures put on the health care workforce. As a nurse manager of a trauma center told us, "It's a different climate we're in [than before the chaos of the pandemic]." As we initiate quality improvements and technological advances in care processes, we must recognize that many teams are in the process of rebuilding shared knowledge. From change management plans that take into account staff shortages to tools that accelerate communication, teams introducing technologies must be careful not to increase caregivers' stress.

3. Training and Education

Training and education play a significant role in establishing and sustaining a highly skilled workforce at both the organizational and national levels. Health care is a constantly changing field, which demands that staff members constantly update their subject matter knowledge and expand their

³⁶ Reisman explained interoperability as the ability "to connect EHR systems so that physicians can easily share their patients' records with other providers regardless of the software being used." Reisman 2017.

skillsets. Our research suggests that the field focus on optimizing simulation training, encourage the development of soft skills and enhance curricula to expose students to various TBC models.

Recommendation #7

Optimize the balance between in-person clinical training and simulation-based trainings

Timeframe

Immediate

Scale

Local, state

Focus group participants expressed the need for enhanced training and education for both novice and experienced staff members. Two nurse managers, one at a West Coast hospital system and the other at a level-one trauma center in the Northwest, identified the need for new nurses to enter the field with more clinical hours and bedside experience. Due to COVID-19, new nurses are entering the field primarily with simulation experience, and “they [new nurses] have no clue what they are walking into.... [I]t is a different type of nurse that is coming out of nursing school.”

As in-person training restrictions have eased, hospitals and educational institutions should carefully consider the right mix of in-person and simulation-based training. For example, in-person training should be emphasized for new staff members so that they can best learn the dynamics of hospital operations, whereas simulation-based training should be prioritized for experienced staff members who already understand clinical context but need to learn new skills.

Recommendation #8

Offer ongoing trainings focused on soft skills, such as communication, self-awareness, critical thinking and leadership skills

Timeframe

Immediate

Scale

Local, state

In addition to clinical and bedside experience, many focus group participants expressed a desire for recent graduates to enter the workforce with better communication, self-awareness and critical-thinking skills. There was broad agreement across the focus groups that recent graduates, even when armed with excellent clinical training, struggle to adapt to the rigors of working as part of a care team in a real-world setting.

National organizations can support ongoing learning for more experienced health care staff members. The Association for Professionals in Infection Control and Epidemiology offers resources for IP practitioners, such as competency models³⁷ and developmental path guides.³⁸ The vice president of infection prevention at a large health care company recommended that national organizations provide similar resources for leadership skills and professional practices

³⁷ Association for Professionals in Infection Control and Epidemiology. (n.d.) Infection preventionist (IP) competency model. Available at: <https://apic.org/professional-practice/infection-preventionist-ip-competency-model/>.

³⁸ Association for Professionals in Infection Control and Epidemiology. (n.d.). Developmental path of the infection preventionist. Available at: <https://apic.org/professional-practice/roadmap/>.

outside IP. Such efforts will broaden the pipeline of health care workers ready to move into leadership roles later in their careers.

Recommendation #9

Enhance and spread understanding of team-based models through education and training

Timeframe

Medium term

Scale

Local, national

As evident from the literature, team-based care is here to stay, but it has been implemented differently from hospital to hospital and continues to evolve with new technology and processes. Helping learners understand different models of TBC and the importance of communication will help anyone working in a hospital environment know the principles that different hospitals hope to instantiate with their use of various models. Exposing learners to different TBC models and the communications principles that they entail will also highlight how teams approach problems like IPC based on how they are structured.

As one focus group participant indicated, many of her students are placed within hospitals near the college in which she teaches, enabling preceptors to give students primers on how each hospital team operates so that they can better prepare for clinicals. Just as important, some focus group participants stressed how younger health workers are more mobile and move from hospital to hospital more frequently than mid- or senior-level colleagues. If the younger workers move among hospitals more frequently as these participants suggest, background knowledge on organizational design and TBC could help give staff members a better sense of how different environments operate and which models best suit workers' personal styles.

Finally, health care will continue to evolve, and the way hospitals operate this year will very likely differ from how they operate five years from now. As a field, we must lean into change and provide senior members of the workforce the skills and knowledge to navigate changes in the way teams work with one another and new technologies and adapt accordingly.

4. Organizational Structure and Processes

Hospitals' organizational structure can lead to improved processes and functioning. Participants shared recommendations that national organizations could implement to help improve organizational functioning and efficiency at both the hospital and national levels. In short, participants believed that collaboration within and between hospitals must be improved.

Recommendation #10

Improve care coordination by reinforcing interprofessional communication and collaboration

Timeframe

Medium term

Scale

Local, national

Several focus group participants noted that the pandemic highlighted their reliance on the entire health care team to accomplish patient safety. For instance, the vice president of infection prevention for a large national health system stated that her team was incredibly reliant on their

facility staff and leaders to quickly reengineer heating, ventilation and air conditioning (HVAC) and air exchange systems to optimize airflow. This participant has since worked closely with facility teams to identify other risks associated with hospital infrastructure, such as water systems and cooling towers in managing other infections like Legionnaires’ disease. She used this example to highlight the benefits of working closely across all departments and bringing nonclinical staff into the conversation concerning IPC. Moving forward, hospitals must leverage the expertise and skills of all staff members, whether they be nurses, pharmacists, environmental services, risk managers, designers, administrators, supply chain or facilities teams, and ensure that they are engaged in the organizational efforts to achieve patient safety.

Although reorganizing hospitals to enable more efficient communications, collaboration and care coordination has been a focus in health care for many years and will very likely take many more years to fully realize, in the short term some participants highlighted the importance of reducing the power gradient between front-line staff and leadership. The care coordinating medical director of a Midwestern hospital system mentioned the importance of soliciting feedback from all levels of an organization, from the front-line to executive level, and stressed the need for a mechanism or feedback loop to do so. Others reported their hospitals’ efforts both to empower nurses and allied health professionals to speak up when they see something that needs to be addressed and to ensure that hospital leadership rolls up their sleeves when they are able and the value this brings to patient safety and improved morale.

Recommendation #11

Reinforce inter-professional and inter-hospital communication and collaboration to build a culture of transparency toward improving patient safety

Timeframe

Long term

Scale

State, national

The chief medical and science officer of a Southern multisite system spoke to the need for a platform similar to the National Transportation Safety Board³⁹ (NTSB) in the health care field. “The [NTSB] is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in other modes of transportation — railroad, highway, marine and pipeline. The NTSB determines the probable cause of the accidents and issues safety recommendations aimed at preventing future accidents.”

In practice, a multitude of organizations serve similar functions (root-cause analyses and safety recommendations) within health care, including the AHRQ Patient Safety Organization (PSO) Program. Given the cost of patient safety incidents in the United States (costs felt by both patients and hospitals), we must find ways of reducing barriers to hospitals’ collaborating. Consistent with federal confidentiality protections underlying PSOs, we must reduce the liabilities associated with sharing information about safety incidents within and beyond the PSO program. In other words, we must develop psychological safety at a national level and find a way

³⁹ National Transportation Safety Board. (n.d.) About the NTSB. Available at: <https://www.nts.gov/about/Pages/default.aspx>.

of applying this and other components of the HRO framework toward the common goal of improving patient safety.

Conclusion

The goal of this white paper is to inform the AHA, the CDC, and health care and educational leaders about emerging trends in team-based care, its evolving impact on infection prevention and control and how the COVID-19 pandemic has altered the goal of patient safety. We are grateful to the many colleagues who offered their time to talk with us and share sometimes difficult experiences with our researchers. It is clear from these discussions that hospitals are in the midst of reflection on these issues. We hope that the recommendations — some of which can be accomplished via Project Firstline, some of which must be pursued via other initiatives — will be helpful under the new dynamics of team-based care and the new stresses that health care teams are experiencing.

Appendix

Our analysis had two components: 1) an environmental scan of peer-reviewed articles and grey literature and 2) a series of in-person and virtual focus groups with nursing leaders, nurses serving as clinical preceptors, service line leaders, C-suite leadership, risk managers and IP specialists. The environmental scan provided context for the use of TBC, how it is defined and its role in IP. These findings then served to inform the design of the focus groups, which followed the environmental scan.

Research aims: The environmental scan sought to address the following questions:

Q1: How is the term “team-based care” being used in health care?

Q2: What is the current state of team-based staffing models in hospitals?

Q3: How are team-based models being implemented, and what strategies are being used to build a team-based culture in health care?

Q4: How is team-based care relevant to infection prevention and control?

The focus groups were designed to address Q3 above as well as:

Q5: What are the essential competencies in TBC that new and future health care workers should have as they enter the workforce?

Environmental scan. The environmental scan began with the formulation of the aims and guiding research questions. The AHA and NORC collaboratively defined the study characteristics by determining inclusion and exclusion criteria (Table 1). Peer-reviewed literature included articles published between January 2015 and May 2022, in the United States, Canada or the United Kingdom, and in acute-care hospital settings (i.e., primary care excluded). The grey literature search followed similar parameters except it focused on more recent publications: January 2018 to May 2022. Key search terms (Table 2) were used for both grey and peer-reviewed literature to generate sources, and 56 sources fit the inclusion criteria. Thirty-one of these were from grey literature (55%), and 25 were peer-reviewed publications (45%). Articles were tracked, described and logged in Covidence, a literature review and qualitative coding resource. Information from Covidence was synthesized via a slide deck describing the outcomes of the environmental scan.

Focus groups. The focus group planning began with the development of a discussion guide based on the environmental scan findings and the concurrent recruitment of participants via email outreach by the AHA. The focus groups were conducted using two formats: 1) in-person at the July 2022 AHA Leadership Summit and 2) via Zoom from August through October 2022.

Table 1: Type of Literature Included in the Review, by Year, Setting and Focus Area

Year (peer-reviewed): January 2015 to May 2022

Year (grey): January 2018 to May 2022

Location (peer-reviewed and grey): United States, Canada and United Kingdom

Study focus areas (peer-reviewed and grey): Studies involving acute-care hospital settings, with a focus on IPC, community colleges, and/or preceptorships

Twelve participants were recruited for the in-person focus groups, and eight participated. Candidates who were unable to participate in the in-person focus groups, as well as a broader group of respondents, were invited to participate in virtual focus groups. Seven individuals participated in these latter groups, bringing the total number of participants to 15.

NORC staff moderated and took detailed notes of the live and virtual focus groups. In addition, all focus group sessions were audio-recorded and transcribed to expand on and ensure accuracy of the live notes. Transcripts from each focus group were synthesized into key takeaways, which were then combined into key themes across all focus groups. Select quotations were also extracted from the transcripts.

Table 2. In-depth Environmental Scan Search Terms

Terms in the left column were used in combination with those in the right column to generate searches.	
<ul style="list-style-type: none"> • TBC • Team-based model • Health care teams • Interprofessional team • Interprofessional collaboration • Interdisciplinary team • Multidisciplinary team 	<ul style="list-style-type: none"> • Acute care • Inpatient care setting • COVID-19 • Infection prevention and control • Hospital-acquired infections • Community colleges • Preceptorship

Table 3. Demographics of Focus Group Participants

Participant	Role	Description of Organization
A	Market director, clinical operations	Midwestern hospital system (100+ facilities)
B	Director of nursing	Midwestern hospital (400+ beds)
C	Associate director/nurse manager	West coast hospital (800+ beds, 2,000+ physicians)
D	Director of nursing	Rural, Midwestern critical access hospital (<50 beds)
E	Care coordination medical director	Midwestern hospital system (8 hospitals, 2,000+ staff physicians, 10,000+ employees)
F	Clinical director for cardiopulmonary services	Southwestern hospital (200+ bed, full-service hospital)
G	System chief clinical officer	Midwestern hospital system (6 hospitals, 800+ physicians, 10,000+ employees)
H*	Program analyst	Federally run national health system
I	Nurse and preceptor	Level-1 trauma center in the Midwest; preceptor at nearby community college
J	Nurse manager	Northwestern level-1 trauma center for a safety-net hospital (400+ beds)
L	Vice president of infection prevention	Large health care company (53,000 employees) of long-term acute care and rehabilitation hospitals

M	Chief medical and science officer	Southern multisite system (17 acute care hospitals, 750+ care sites)
N	Nurse manager	Large academic medical center (~900 beds) in the Southeast
O	Clinical manager	Midsized health system (~300 beds) based in the mid-Atlantic region
P	Associate director	Large academic medical center (~700 beds) located in the mid-Atlantic region

**This individual was recruited on-site and was not a preselected candidate.*

Table 4. Core Competencies of Interprofessional Collaboration⁴⁰

Domain	Key Competency
Values/ethics	Respect the unique cultures, values and expertise of other health professionals
	Develop a trusting relationship with patients, families and team members
Roles/responsibilities	Use the full scope of knowledge, skills and abilities of available health professionals and workers to provide safe, timely, efficient, effective care
	Engage in continuous professional and interprofessional development to enhance team performance
Interprofessional communication	Choose effective communication tools and techniques to facilitate discussions and interactions that enhance team function
	Organize and communicate information with patients, families and health care team members in a form that is understandable
	Express one's knowledge and opinions to team members involved in patient care with confidence, clarity and respect
	Listen actively and encourage other team members' ideas and opinions
	Recognize how one's own uniqueness, including experience level and expertise, contributes to effective communication, conflict resolution, and positive interprofessional working relationships
	Communicate consistently the importance of teamwork in patient-centered and community-focused care
Teams and teamwork	Give timely, sensitive, instructive feedback to others about their performance on the team
	Engage other health professionals in shared patient-centered problem solving
	Apply leadership practices that support collaborative practice and team effectiveness

⁴⁰ Interprofessional Education Collaborative Expert Panel. Core competencies for interprofessional collaborative practice: Report of an expert panel. Washington, D.C.: Interprofessional Education Collaborative; 2011. Available at: <https://ipec.memberclicks.net/assets/2011-Original.pdf>