ACOEM POSITION STATEMENT

Interaction of Health Care Worker Health and Safety and Patient Health and Safety in the US Health Care System: Recommendations From the 2016 Summit

Ronald Loeppke, MD, MPH, Jodie Boldrighini, RN, MBA, John Bowe, Barbara Braun, PhD, Erik Eggins, Barry S. Eisenberg, Paul Grundy, MD, MPH, Todd Hohn, CSP, T. Warner Hudson, MD, John Kannas Jr., MSPH, E. Andrew Kapp, PhD, CSP, CHMM, Doris Konicki, MHS, Paul Larson, MS, Stephanie McCutcheon, Robert K. McLellan, MD, MPH, Julie Ording, MPH, Charlotte Perkins, Mark Russi, MD, Cindy Stutts, MS, RN, and Mary Yarbrough, MD, MPH

Since the publication of the Institute of Medicine's groundbreaking report *To Err is Human* in 2000,[1] patient safety has become a key health care issue, driving decision-making and policy formulation in virtually every sector of the health care system. In 2008, Berwick stated that the US health care system could only be improved if it focused on three aims: (1) improving the experience of patient care; (2) improving the health of populations; and (3) reducing per capita costs of health care.[2]

More recently, a new topic has begun to emerge: the health and safety of those who deliver health care—from physicians and nurses to administrative and service personnel—and how that can impact the health and safety of patients. It is becoming clear that workers in this high stress, demanding sector are themselves prone to a wide variety of health risks, ranging from musculoskeletal issues to depression and burnout. This burnout and dissatisfaction among health care workers compromises the goals of the triple aim. Therefore, there is a need to expand the triple aim into the quadruple aim, which includes the goal of improving the work life and well-being of health care providers.[3]

In the midst of these factors, health care leaders have begun to recognize the irony that the very places charged with addressing patient safety—America's hospitals, care clinics, and medical offices—face significant health and safety challenges of their own. For example, the incidence rate of total recordable injuries and illnesses for private hospitals and residential care facilities was 7.7 and 8.8 per 100 full time workers in 2007, respectively, as compared with 4.2 for private industry overall.[4] There is growing agreement that the health and safety of patients is inextricably linked to the health and safety of those who care for them.[5,6]

Without a safe and healthy work environment for the millions of individuals who provide care for and support the needs of patients, the core goal of ensuring patient safety is placed at risk. Healthy and safe health care workers are more likely to provide care that leads to optimized patient health and safety.

Striving to address this fundamental obstacle to the provision of true patient safety requires a new way of thinking about, and talking about, the health care workplace. It requires a new vision and a culture shift in which health care employers put a new emphasis on ensuring the health and safety of their own workers as well as addressing issues of *patient* safety. It requires striving to achieve greater parity of resources, alignment of workplace incentives, commitment from health care organizations and standard-setting bodies, and a new focus on accountability for healthy and safe employee environments, beginning with senior leadership.

At the heart of this vision is a new and emerging concept of health care worker safety and wellness—a concept that includes a wide spectrum of components that contribute to an optimally functioning health care worker—physical and psychological safety, enhanced individual health, and the creation of well-designed, supportive working environments. The end goal is to create places where it is just as safe to work as it is to receive care. Healthy and safe workers are the gateway to healthy and safe patients. Thought leaders are beginning to construct models that promote this new vision for health worker safety and wellness.

BACKGROUND

To explore these ideas, the American College of Occupational and Environmental Medicine (ACOEM) and Underwriters Laboratories Integrated Health & Safety Institute (UL IHSI) hosted a Summit on the Interaction of Health Care Worker Health and Safety on Patient Health and Safety in the US Health Care System in July 2016 at ACOEM Headquarters in Elk Grove, IL. Summit participants were health executives and safety professionals from a variety of health care systems and organizations (see Acknowledgments).

The purpose and goals of the Summit were to:

(1) explore the evidence linking worker health and safety with patient health and safety;
(2) develop a series of recommendations on how best to integrate worker and patient health and safety programs;
(3) examine potential means of evaluating the effectiveness of these programs, with results to include quality, satisfaction, and cost metrics for employee/patient health and safety that will improve over time; and
(4) promote implementation and dissemination of the best and most effective practices.

To help achieve these ends, Summit participants reviewed programs from leading US health institutions that are working to improve the health and safety of their employees in an effort to create environments that are more conducive to patient safety and improved health outcomes.

SCOPE OF ISSUES

For centuries, health care culture has been patient-centered, while physician and nurse training has historically de-emphasized self-care. "Resources are primarily allocated to meet the needs of patients and medical technology, often leaving the

safety of staff and quality of work-life issues unaddressed."[7] However, more recently, ethicists have begun calling out the imperative that health care providers must care for themselves.[8]

Historically, health care organizations have tended to silo safety activities for workers and patients into separate functional areas, in part because the fields of occupational health and patient safety developed independently at different points in time. While occupational health and safety considerations have a long history dating to Hippocrates, the field of patient safety is still relatively young.[9]

Researchers and experts are now coming to understand that many of the same characteristics of the environment of care and active errors that contribute to unsafe worker conditions and practices also contribute to adverse events for patients. For example, researchers have shown that the same underlying organizational factors that contribute to worker injuries, such as high job demands, workloads, and understaffing, combined with low social support and teamwork and a weak safety culture, also contribute to patient falls.[10] Yet the traditional silo approach to patient and worker safety continues, leading to duplication of effort, confusion, missed opportunities, and unintended consequences, despite evidence that integrating patient and worker safety activities could help health care organizations to sustain and improve safety practice and outcomes.[11] In the meantime, the extent of issues occurring within the silos that separate patient health and safety and health care worker health and safety is significant.

Patient Safety

It is difficult to obtain reliable estimates of patient safety-related adverse events and error rates because of the variation in definitions, sources, and methodologies for measurement.[12,13] Early estimates for the annual number of premature deaths due to medical error include the oft-cited numbers of 44,000 to 98,000.[1] A recent estimate suggests errors contribute to over 400,000 deaths per year.[14] A 2016 analysis suggests medical error should be considered the third leading cause of death in the United States,[15] although experts have concluded that there is still no agreed upon national rate.[16]

Since most errors do not result in death, the number of errors is surely many times the number of deaths. This number is subject to the same limitations as estimating death rates due to variation in definitions and methodologies. Commonly reported national estimates of hospital-acquired conditions from 2013 include 1,320,000 adverse drug events, 290,000

catheter-associated urinary tract infections, 9200 central line-associated blood stream infections, 240,000 falls, 77,000 obstetric adverse events, 1,060,000 pressure ulcers, 79,000 surgical site infections, 37,000 ventilator-associated pneumonias, 23,000 postoperative venous thromboembolisms, and 822,000 other hospital-acquired conditions.[17]

Interestingly, one of the most prominent conceptual models for measuring errors in the patient safety literature is the systems engineering initiative for patient safety (SEIPS) model of work system and patient safety.[18] This sociotechnical system approach integrates macro-ergonomic and human factors engineering domains to evaluate the impact of health care work systems and processes on quality and patient safety. It has been suggested that improvements in patient safety have been slowed by inadequate integration of human factors and ergonomics principles into improvement initiatives.[19]

Health Care Worker Health and Safety

According to the US Bureau of Labor Statistics, health care occupations and industries are expected to have the fastest employment growth and will add the most jobs between 2014 and 2024.[20] Health care workers deal with occupational health and safety hazards, putting them at risk for musculoskeletal disorders, infectious diseases, and mental stress.[21]

Health care is now the most dangerous work in the United States with respect to incident rate. The injury and illness rate in hospitals remains nearly double the rate for private industry as a whole and it is also higher than the rates in construction and manufacturing.[22] In response, the US Occupational Safety and Health Administration (OSHA) has targeted health care work in a special emphasis program that focused on areas of concern that overlap with patient safety, including:

- Slips, trips, and falls
- Patient handling
- Ergonomic issues
- Violence
- Bloodborne pathogen exposure

Although some other industries have higher fatality rates, emerging infectious diseases have led to high death rates for health care workers caring for patients with several of these diseases (arboviruses such as Ebola and SARS). In addition, health care workers experience depression (eg, the prevalence of depression of physicians is at 39%),[23] anxiety, emotional exhaustion (eg, the prevalence of emotional exhaustion among primary care nurses is 23% to

31%),[24] and alcohol/substance abuse or dependence. A recent study found that 12.9% of male physicians and 21.4% of female physicians met criteria for alcohol abuse or dependence.[25]

Job stressors associated with ill health among health care workers include work overload, pressure at work, lack of participation in decision-making, poor social support, unsupportive leadership, lack of communication and feedback, staff shortages and unpredictable staffing, scheduling or long hours, and conflict between work and family demands. All of these factors impact the psychological well-being of workers while impacting patient care.[26,27]

Burnout among physicians has also increased, from a rate of 45.5% in 2011 to 54.4% in 2014.[23] Burnout is associated with medical errors,[28] and reduced empathy. It also results in physicians leaving the profession early.[29,30] Health care professionals feel fatigued, stressed, overburdened, at risk and/or in pain, and do not feel able to provide consistent quality care.[31]

The American Nurses Association surveyed 4614 nurses in 2011 to better understand their concerns about health and safety in their work environments, document exposure to hazards, and measure changes in conditions since the last survey in 2001. The top two health and safety concerns expressed by nurses remain the same since 2001—the acute or chronic effects of stress and overwork (74%), and disabling musculoskeletal injury (62%). Concerns about an on-the-job assault have increased from 25% to 34%, though a smaller percentage reported actually being physically assaulted compared with 2001.[32]

POINTS OF INTERSECTION BETWEEN PATIENT HEALTH/ SAFETY AND HEALTH CARE WORKER HEALTH/SAFETY

The statistics regarding issues in the health and safety of patients and the health and safety of health care workers are compelling and clearly warrant increased efforts to find solutions for each—but is it possible to create workplace programs that address them in tandem? This question was a core discussion driver at the ACOEM/UL Summit, with participants agreeing that a key step toward potential tandem solutions is identifying points of intersection between the safety of patients in health care facilities and the workers who staff those facilities. ACOEM/UL Summit participants identified a wide range of factors in health care workplaces that can impact the safety of both patients and health care workers (Table 1).

In recent years, several systematic reviews have been conducted that were

TABLE 1. Factors Affecting the Safety of Both Workers and Patients

Fatigue
    Shift work
    Fatigue risk management
	Organizational Culture
	    Learning environment
	    Safety culture, safety climate
	    Teamwork

Ergonomics and Human Factors
    Equipment and technology design
    Built environment, healthy workplace,
        prevention by design
	Staffing
	    Workload
	    Turnover, burnout
	    Appropriateness, skill mix

Physical Harm
    Behavioral assaults
    Criminal activity and violence
    External environment and community
        hazards
	Psychological Safety
	    Lack of respect
	    Production pressures
	    "Second victims"*
	    Resiliency, coping skills
	    Substance abuse

Satisfaction with Care
    Patient experience
    Patient perception of safety during transfers,
        etc.
	Satisfaction with Work Environment, Work Life
	    Worker engagement, well-being
	    Workplace incivility, intimidation,
	        disruptive behaviors
	    Professional failure to thrive

Communication
    Patients and families
    Employees and management
	Exposure to Hazardous Materials
	    Chemicals
	    Radiation
	    Medications

Mobility, Movement, and Handling-related Events
    Safe patient-handling
    Slips, trips, and falls
    Pressure-ulcer prevention
	Transmissible Infectious Pathogens
	    Bloodborne (needlesticks, sharps-related
	        surgical injuries), airborne, droplet, contact
	    Use of precautions and personal protective
	        equipment

*Health care providers who are involved in an unanticipated adverse event, medical error, or patient injury and are traumatized by the event.

aimed at quantifying these and other points of intersection between patient and health care worker safety. Though not intended to be a comprehensive literature review, the following studies address various components of this relationship:

- An examination of the relationship between health care worker burnout, psychological well-being, and patient safety found that more than 80% of the 46 studies reviewed supported the concept that well-being and burnout are associated with patient safety in the expected directions.[33]
- A review of 18 studies conducted into the effect of physicians' occupational well-being on the quality of patient care reported positive associations of occupational well-being with patient satisfaction, patient adherence to treatment, and interpersonal aspects of patient care.[34] Studies reported conflicting findings for occupational well-being in relation to technical aspects of patient care. One study found no association between occupational well-being and patient health outcomes.
- A meta-analysis of 19 studies investigated the effectiveness of interventions to reduce burnout in physicians.[35] Overall, interventions were associated with small but significant reductions in burnout, with greater effects for organization-directed interventions than physician-directed interventions.
- A 2016 study investigated the relationship between patient safety, teamwork, and clinician occupational well-being.[36] The review of 98 studies found support for the existence of independent associations between the variables and proposed a conceptual framework for examining causality in future studies.
- A qualitative systematic review of 19 studies to identify factors associated with high-performing hospitals across a variety of patient outcomes found positive organizational culture to be the first of seven identified themes.[37] Other themes included receptive and responsive senior management, effective performance monitoring, building and maintaining a proficient workforce, developing effective leaders across the organization, encouraging expertise-driven practice, and promoting interdisciplinary teamwork.
- In a review of 29 studies, evidence was found of associations between hospital work environment and nurse-sensitive patient outcomes.[38] Nurse staffing hours were inversely related to patient falls. Other characteristics associated with better outcomes were collaborative relationships between nurses and physicians, higher levels of nurse education, and greater nursing experience.
- A review of 17 studies that connected patient safety culture to nurse-sensitive patient outcomes at the hospital and nursing-unit level of analysis found statistically significant correlations was limited, particularly when using nurse-sensitive outcomes.[39]
- A review of 14 studies that focused on organizational climate and patient outcomes found positive organizational climates were generally related to improved patient safety and worker satisfaction, with mixed results related to worker turnover.[40]
- An evidence scan of more than 100 articles on the relationship between safety culture and patient and staff outcomes conducted by the Health Foundation of the UK found mixed results related to patient outcomes, but more evidence that improving safety culture impacts staff safety behaviors and injury rates.[41]
- A review of 23 studies from 12 projects on human factors and ergonomics (HFE)-based health care system found empirical evidence for the effectiveness of HFE-based health care system redesign and recommended greater recognition of and investment in HFE-based quality improvement.[42]

Although not systematic reviews, several other scholarly papers summarized associations between organizational and environmental factors that affect worker health and safety and patient outcomes.[43] Other studies have explored the impact of health care staff fatigue on patient safety.[3,28,44,45]

DATA GAPS AND RESEARCH NEEDS

While strong evidence exists documenting an impactful relationship between patient and health care worker safety, ACOEM/UL Summit participants identified several areas that require more research and investigation. These included:

- Descriptive epidemiology, seeking common risk factors for patient and employee injury/illness.
- Prospective interventional studies across topic areas with rigorous experimental or quasi-experimental quality improvement designs. Previous studies are observational and retrospective and lack the ability to determine causality.[41]
- Studies of direct and indirect financial benefits of efforts to address patient and worker safety.[40] More research is needed

on specific interventions and their cost-effectiveness.

- Building integrated databases related to patient and worker safety that link patient/employee safety events.
- Development of improved safety and injury surveillance systems with alerts that help identify dual patient and employee health and safety outcomes across health care settings.
- Demonstrations of the value of non-punitive error and near-miss reporting for both worker and patient adverse events.
- Training to raise staff and administration awareness of inter-relationships and use structured root-cause and other analyses to identify causes and contributing factors related to patient and worker safety.
- Training to raise payers, insurers, and policy-makers awareness of the benefits of considering safety for workers and patients using an integrated framework.

ESSENTIAL ELEMENTS FOR SUCCESSFUL LAUNCH OF INTEGRATED HEALTH CARE WORKER HEALTH AND PATIENT SAFETY PROGRAMS

In addition to establishing points of intersection between patient health and safety and health care worker health and safety, and reviewing and highlighting the evidence base bolstering the validity of this relationship, Summit participants discussed a potential framework for bridging the gap between the two for greater impact and effectiveness in health care workplaces. As a part of this discussion, participants identified key elements necessary for successfully integrating patient health and safety efforts with health care worker health and safety efforts to achieve synergies and improved results. Table 2 outlines the elements participants considered particularly important in launching such initiatives in the workplace.

Underlying these elements is an approach to the health and safety of employees that incorporates a holistic view of well-being. Beyond traditional occupational health and safety, personal health and lifestyle are affected by and affect work performance, as noted in the National Institute for Occupational Safety and Health (NIOSH) Total Worker Health (TWH[TM]) program.[46] This philosophy, when implemented by employers, leads to sustainable "cultures of health and safety" in the workplace.

The occupational health and safety communities have invested considerable effort in recent years in developing best practices intended to build pervasive and sustainable cultures of health and safety among employees. Efforts have been made to create new collaborative work environments in which traditionally separate safety and wellness silos in organizations are brought together with shared strategic goals, metrics reporting, and management structures.[47] The end result is workplace environments in which formerly disconnected teams work together to share resources, data, and processes in a way that magnifies their effectiveness in maintaining overall employee well-being.

Many programs and activities in the health care sector lend themselves well to these cross-silo, collaborative approaches. For example, in medical centers, significant efforts are made to protect the health of both the health care employee and the patient through health care workers' immunizations and use of personal protective equipment. Institutional programs aimed at increasing employee vaccination rates for tuberculosis, hepatitis, and can be reinforced by collaboration of patient safety teams and occupational health and safety teams. While the many bloodborne pathogen (BBP) exposures that occur in health care personnel are handled first to protect the employee, these efforts also help prevent patient exposures.

Similarly, slip-and-trip interventions, designed to improve employee safety via design and engineering control, also impact patient safety. The use of ceiling lifts in hospitals reduces patient falls and skin tears, while at the same time dramatically increasing worker safety. Psychological programs in the workplace, aimed at reducing stress and creating more harmonious work environments, also have direct patient impacts.

With occupational health and safety and patient safety teams exchanging information, working collaboratively in new ways, and seeking common goals, the underpinnings of a true culture of health and safety—benefiting employees and patients—can be established. To advance a new model of interaction between occupational health and safety and patient health

and safety communities, Summit participants identified the following elements as key building blocks.

Leadership Support and Accountability

As with any major employer initiative, buy-in and support from all levels of senior management is critical for any effort aimed at workers in a health care setting. Successful programs should include top-down drivers, for example, accountability of leaders at all levels of management. Elevating the visibility of leaders in the integration effort within an organization is important and can be advanced by creating a health and safety advisory board, chief health and safety officer position, or fostering health and safety champions, whose responsibilities include serving as primary advocates for motivating employees and achieving results. Health and safety champions should establish a sense of urgency, develop consistent messages articulating a vision for change, and ensure cross-collaboration and involvement of all operational areas in building a culture of health and safety. In many health care facilities today, daily patient safety huddles have become a standard feature—by expanding the scope of these meetings to incorporate employee safety, and including senior executives in the huddle, an integrated effort is more likely to succeed.

Staff Buy-in and Participation

Just as top-down senior leadership is essential, so is grassroots staff engagement and bottom-up participation in an integration effort. Summit participants stressed the importance of vigorously reaching out to employees to solicit their input and help in building a shared vision for success. During all phases of the roll-out of an integration initiative, employees must understand long-term goals and expectations. Management should be charged with articulating the vision so employees understand their roles, responsibilities, and how they can contribute to success. This includes assembling teams early in the process so that grassroots employees can participate in a meaningful way in program design. All employees should be engaged in contributing to a new overarching culture of health and safety. As a part of a buy-in effort, rewards and incentives should be used to recognize those who help advance institutional goals.

System Interfaces Between Patient/Health Care Worker Health and Safety

To achieve success, health care worker health and safety programs should have a compatible, comparable organizational

TABLE 2. Key Elements for Successful Integration of Health Care Worker Health and Patient Safety

Leadership support and accountability	Simplicity of design
Staff buy-in and participation	Aligned governance infrastructure
System interfaces between patient/health care worker health and safety	Evidence-based measurement tools

structure, and alignment with patient health and safety programs. And, just as important, the investment in worker health and safety should be equivalent as the investment in patient health and safety. Health care worker health and safety programs should leverage the relationship with patient health and safety programs to take advantage of resources and visibility and their economic importance to institutional success. There should also be strategic alignment between operational centers, such as human resources, benefit design, and risk management.

Evidence-Based Measurement Tools

Another major component in integrating health care worker health and safety and patient health and safety programs is the development of standards to drive action. Metrics and measures which underlie the culture necessary to support both employee and patient health and safety must be developed. There was broad agreement among Summit participants that the use of scorecards, dashboards, and other metric-tracking tools are essential for measuring progress toward health and safety goals, and that these tools should be developed and reviewed on a daily/weekly basis. New surveying methodologies, integrating collection of relevant data sets impacting health and safety for both patients and employees, should be developed. Health and safety team scorecards or dashboards should be readily available to all levels of management and analysis of metrics should be used to help in refining programs. Scorecards, dashboards, and other metric tools should be shared and reviewed widely by employees at all levels.

Simplicity of Design

System interfaces, measurement tools, and other components of an integrated system should be kept as simple as possible—particularly in the early stages of an employee/patient health and safety change initiative. In the area of metrics in particular, organizations may be tempted to create more extensive or exhaustive lists of categories for measurement than they need to accomplish core goals. Program elements must be well understood and easily transferable across organizational departments, which over time will help lead to an ingrained culture of employee health/ safety and patient safety. This is a compelling rationale for simplicity of design in early roll-out phases and for close monitoring of program processes and functionality over time.

Two OSHA standards (the Hazard Communication standard and the BBP standard) and several OSHA guidance documents (related to workplace violence prevention, infection control, repetitive motion injuries, and safe patient handling) reference specific steps that health care employers should take to reduce the risk of injury or illness among employees.[48–53] NIOSH has published guidance on exposure to chemotherapeutic agents and other hazardous drugs. Failure to consider following these OSHA standards and various guidance documents, to incorporate appropriate control measures in an employer's written health and safety plans, and/or to control these risks using widely accepted technologies and worker training, place health care employers at risk of an OSHA violation of these standards or of the OSHA General Duty Clause. Accordingly, employers should prepare written plans, documenting how they are: (1) addressing these risks; (2) tracking rates of work-related illnesses and injuries; (3) training employees to protect themselves from these hazards; and (4) engaging employees in the preparation of written plans and evaluation of the effectiveness of their plans.

Aligned Governance Infrastructure

To maximize alignment between employee health and safety and patient health and safety teams, new management structures may be required. Hybrid safety steering committees may be established that include employees representing both worker-safety and patient-safety interests. Management lines of authority may need to be adjusted, with mid-level managers reporting to a senior-level manager tasked with oversight of integrated health and safety efforts. Formerly disparate operational centers may have a role in this new infrastructure: In many health institutions, for example, bullying and violence has become a growing issue, often related to employee stress and burnout. In these circumstances, a director of security or facility security officer may contribute to overall patient/employee health and safety efforts as a part of a new integrated infrastructure.

METRICS/SCORECARDS/ DASHBOARD

Summit participants agreed that one of the most important elements in integrating health care worker health and safety with patient safety efforts in health care workplaces is finding ways to measure results and share measurements across teams. A first step in setting up a workplace health and safety measurement program is the identification of key metrics and compiling and analyzing these metrics over time. Metrics should be tracked by unit but shared throughout the organization, to aid in identifying programs that have had minimal issues and to learn from their success. Data for integrated metrics should be readily accessible in periodic intervals.

Summit participants agreed that because of the unique interrelationship between patient safety and health care worker health and safety, health care workplaces have many opportunities for combined metrics reporting. For example, in a hospital, an integrated metrics report for a particular unit might include not only data on patient safety issues, incidents, and "near misses" but also data on health care staff working within that unit—such as workers' compensation claims, health risk assessments (HRAs), medical and pharmacy claims data, and environmental protection agency encounters. Summit participants created a model dashboard (Table 3) containing relevant metrics that could be used in a health care setting.

BEST PRACTICES ON INTEGRATION OF WORKER HEALTH AND PATIENT SAFETY

As a part of the Summit, several leading US health care institutions shared information about programs they have begun implementing that seek to optimize the health of their employees and create environments more conducive to patient safety. Appendix I includes brief descriptions of some of these programs, all of which feature broad organizational participation—from senior managers to hourly workers—and utilize scorecards or dashboards with metrics relevant to their particular needs. Appendix I also contains the questions that were posed to these health systems as a part of the Summit in order to learn more about efforts they are making to improve both their health care workers' health and safety as well as the safety of the patients they treat.

BUILDING A SUSTAINABLE AND REPLICABLE MODEL

In addition to the six elements essential to the launch of integrated patient/ employee health and safety programs, highlighted in Table 2, Summit participants noted the need for several other elements to ensure such programs are sustainable and replicable. These components are listed in Table 4 and include:

Staff Empowerment and Delegation of Authority

Summit participants expressed strong belief that employee engagement is critical for long-term success in creating an overarching culture of patient/employee health

TABLE 3. Sample Metric Grid for Assessing Health Care Worker Health and Safety/Patient Health and Safety

	Surgical	Internal Med	ICU	CCU	ER	Ortho	Pediatric	Other
Patient Health and Safety Metrics								
Event resulting in death or dismemberment								
Event resulting in multiple hospitalizations								
Near misses that could have resulted in death, severe injury								
Medical error report (rate)								
Patient falls/1000 patient days								
Hospital acquired pressure ulcers (rate)								
Hospital acquired infections (rate)								
Overall patient safety incidents/1000 patient days YTD								
Health Care Worker Health and Safety Metrics								
Turnover rate—annual %								
Worker's comp injury/claims/100 FTE—annual								
% of health care workers receiving annual influenza vaccinations								
% or rate of TB conversions								
% of health care workers converting HIV, hepatitis B or C from BBP exposures								
Aggregate number high health risks per worker (out of the 15 Edington risk factors identified through a health risk assessment)[54]								
Rate of "sharps log" injuries								
Rate of episodes of workplace violence								
Metrics related to OSHA recordable injuries and illnesses								

BBP, bloodborne pathogen; CCU, critical care unit; ER, emergency room; FTE, full-time equivalent; ICU, intensive care unit; OSHA, Occupational Safety and Health Administration; TB, tuberculosis; YTD, year to date.

and safety. Employees must be empowered and deputized across operational silos so they can act directly to move health and safety goals forward. Management should proactively seek out employees' ideas, using team meetings, focus groups, surveys, and other tools to help them participate. Employees, like senior management, must also be held accountable for implementation of program elements and adherence to roll-out plans. If health and safety is built into employee culture at the grassroots, it will be more likely to remain, despite changes in leadership.

Internal Communication

Establishment of new cultures requires strong, sustained communication, deployed via multiple channels to reach diverse employee populations. In addition to electronic and print communications, face-to-face meetings should play a strong role in communications, including daily briefings to review patient safety and/or health care worker incidents, near misses, and other data. Information from these meetings and from metric reviews should be widely disseminated so all employees are kept informed of progress or setbacks. Summit participants agreed that organizational transparency is an important attribute that helps establish integrity and credibility during phase-in of new initiatives.

Well-Articulated Business Case

Of critical importance for sustainability is establishing the connection between business performance and health and safety policies. The key message that must be communicated from day 1 of a new initiative is that a healthy and safe workforce impacts an organization's ability to achieve its business mission. The health and safety vision should be compatible with the overall vision, mission, and values of the organization and ideally it should be formally incorporated within corporate principles or values. Resources will be required in implementing a new vision—changes in the built environment may be needed, including ergonomic modifications or equipment installations. This means that safety champions must present their case for enhancements in alignment with business objectives and in a way that will resonate with the chief financial officer and other senior managers.

Development of Standards

Summit participants discussed the lack of consistent national standards for many of the factors described in Table 3, noting that standards could help drive adoption of and adherence to new practices in patient/employee health and safety. The influence of standard-setting organizations as well as state and federal regulatory authorities would help provide impetus for organizational change. In the meantime, employers should establish new shared internal standards and best practices, based on their own metrics and data, to help strengthen the integration of patient and employee health and safety teams.

Partnerships/Collaborations

Employers should seek out other stakeholders with similar interests in patient/employee health and safety in order to share resources, data, and best practices. Organizations such as the American Hospital Association, US Centers for Disease Control and Prevention, US Occupational Health and Safety Administration, US Department of Labor, and others can provide tools, support, and opportunities for partnership. Over time, partnerships will be needed between diverse stakeholders in order to formalize standards and best practices, create new legislative and regulatory policies, and "unlock" data in a way

TABLE 4. Elements Needed for Building Sustainability and Replicability in Health and Safety Programming

Staff empowerment and delegation of authority	Partnerships and collaborations
Internal communication	Culture of reporting
Well-articulated business case	Culture of learning and continuous improvement
Development of standards	Focus on psychological health and safety
Access to health resources	Evidence based benefit design

that allows institutions to build a shared knowledge base advancing patient and employee health and safety initiatives. At the educational level, partnerships with organizations such as the American Association of Colleges of Nursing, Association of American Medical Colleges, Accreditation Council for Graduate Medical Education, and others could extend these new models and concepts into the training environment, where they would influence the next generation of health care workers.

Culture of Reporting

Summit participants agreed that overcoming barriers to reporting health and safety incidents, near misses, and violations of protocol is a significant hurdle in achieving models of patient/employee health and safety integration. For sustainability, employers should take steps to remove stigmas and cultural barriers that keep individuals with information from stepping forward. Environments must be created in which mutual respect and professionalism have high value and staff feels comfortable reporting errors and speaking candidly and openly about system issues. Summit participants noted that the early reporting of incidents and issues is a particularly important mechanism for avoiding more serious exacerbation of problems over time.

Culture of Learning and Continuous Improvement

Cultures of reporting are complemented by cultures of learning and continuous improvement. Employers should adopt the principles of Six Sigma, lean management, total quality management (TQM), and other management systems that stress an open, ongoing attempt to learn from mistakes, and make process-adjustments. Safety huddles, posttraumatic incident debriefings, and other evaluative tools should be a prioritized element in patient/employee health and safety initiatives.

Focus on Psychological Health and Safety

One of the driving components of poor health and safety among health care workers is stress and burnout which leads to disruptive behavior, depression, social isolation, and other issues. Health and safety goals can't be met in an environment where psychological health is not addressed. Efforts should be made to de-stigmatize mental health issues and treatment in order to encourage people to utilize mental health services and to feel comfortable discussing issues related to stress and burnout. Internal scorecards and/or dashboards should include psychological safety and health

metrics. Employers should include mental health enhancement strategies in their overall plans, including mindfulness and resilience training.

Access to Health Resources

Health care facilities are uniquely situated to provide their employees direct access to, and support for, health resources and opportunities to enhance wellness. Health care employers should take steps to ensure all of their own employees have a relationship with a primary care provider and should promote access to other health resources, ranging from HRAs to wellness coaches.

Evidence-Based Benefit Design

Access to health resources goes hand-in-hand with the use of evidence-based benefit design. Good benefit design facilitates the appropriate, positive utilization of services, and minimizes out-of-pocket costs for highly valued employee services. Evidence-based benefit design means that there should be little financial barrier for employees to receive highly valued medical services or treatments, achieved by using behavioral tools, such as incentives, penalties, recognition, rewards, and mandates—all designed to promote employee activation, engagement, and accountability. As an example, employers can consider offering copayments for targeted chronic conditions, or incentives for HRAs. Incentives for doing the right thing can shift employee behaviors and ultimately help establish the foundation upon which a sustained culture of health and safety can be built.

HOW EMPLOYERS CAN BENEFIT FROM A NEW APPROACH TO PATIENT AND EMPLOYEE HEALTH AND SAFETY

The documented evidence of the link between the health and safety of health care worker and health and safety of patients is clear and the benefits for employers of implementing programs aimed at strategically addressing these two issues together exist on multiple levels. Advantages include:

Improved Organizational Effectiveness

- Strengthens the overall environment for building cultures of health and safety.
- Improves environments for team work, improved efficiency, and fewer employee errors.
- Promotes new workplace effectiveness by reducing redundancy in areas such as data collection, accident investigation, and mitigation.

- Helps overcome staff-related limits to patient-safety improvements.
- Increases likelihood of identifying opportunities to intervene with safety strategies before harm occurs to patients or employees.
- Potentially decreases workers' compensation related claims and costs.
- May lead to increased staff retention and decreased staff turnover and replacement.
- Increases patient loyalty, returns, and recommendations, while improving the institution's reputation.
- Decreases the likelihood of litigation.
- Lessens the risk of financial penalties in pay for performance initiatives.
- Increases adherence to health guidelines and lowers externally reported infection rates.
- Improves compliance with regulatory and oversight bodies.
- May result in better quality data with more comprehensive measurement.

Enhanced Patient Safety and Outcomes

- Reduces hazards and adverse events for patients.
- Increases patient satisfaction overall and creates safer and more appealing environments for patients, families, and caregivers.
- May result in improved targeted outcomes, including quicker ambulation, fewer injuries and adverse events, lessened use of restraints, and fewer falls.
- Potentially decreases morbidity and mortality and length of stay; may result in faster healing, quicker recoveries.
- Decreases exposure to bloodborne pathogens, transmission of organisms from workers to patients and patients to patients, as well as health care-associated infections; lowers risk of toxic substance exposure for patients and families.

Healthier Workforces

- Increases worker satisfaction and engagement, improves quality of work life, and enhances morale and teamwork.
- Lessens injuries and illnesses, absenteeism, presenteeism, and restricted-work situations.
- For health workers in particular, decreases musculoskeletal injuries, exposure to bloodborne pathogens, and transmission of organisms from patients to workers and workers to patients.
- Lowers risk of adverse outcomes such as infertility and allergic reactions.
- Reduces employee errors and increases efficiency.
- Decreases stress and burnout and helps prevent substance abuse and mental health issues.

CONCLUSION

At a time when hospitals and other health facilities are treating more—and sicker—patients, with more complicated medical conditions than ever, health care workers find themselves under increased pressure and stress. Research indicates that without a safe, healthy work environment for the millions of individuals who provide care for and support the needs of patients, the core goal of ensuring patient safety is put at risk.

A new approach is needed, one which optimizes the health and safety of health care workers in order to ensure better, safer care for patients. Integrated patient/employee health and safety initiatives seek to achieve the dual goals of improving the environment for patient safety, while enhancing the health, safety, and well-being of employees. True cultural change in the health care workplace is necessary in order to accomplish either goal. In this environment, the occupational health and safety community, with its long history of innovation in worker health and safety programming, can play an influential leadership role.

For success, employers can begin adopting core principles and strategies that build upon the innate connection between patient health and safety and health care worker health and safety, building new collaborative relationships, shared goals, metrics reporting, and process improvement systems between traditionally separated operational centers. Research data and new efforts by leading US health care providers aimed at providing better environments for patient care by improving the health and safety of their employees suggest that this new approach has promise for the future.

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REFERENCES

1. Kohn LT, Corrigan JM, Donaldson MS. Institute of Medicine Committee on quality of health care in America. In: *To Err Is Human: Building a Safer Health System*. Washington, DC: National Academy Press; 2000.
2. Berwick DM, Nolan TW, Whittington J. The triple aim: care, health, and cost. *Health Affairs*. 2008;27:759–769.
3. Bodenheimer T, Sinsky C. From triple to quadruple aim: care of the patient requires care of the provider. *Ann Fam Med*. 2014;12:573–576.
4. Janocha JA, Smith RT. Workplace Safety and Health in the Health Care and Social Assistance Industry, 2003–2007. Washington, DC: US Bureau of Labor Statistics, Compensation and Working Conditions. 2010. Available at: https://www.bls.gov/opub/mlr/cwc/workplace-safety-and-health-in-the-health-care-and-social-assistance-industry-2003-07.pdf. Accessed June 5, 2017.
5. Lucian Leape Institute. *Through the Eyes of the Workforce —Creating Joy, Meaning, and Safer Health Care*. Boston, Mass: National Patient Safety Foundation; 2013.
6. The Joint Commission. *Improving Patient and Worker Safety: Opportunities for Synergy, Collaboration and Innovation*. Oakbrook Terrace, IL: The Joint Commission; 2012
7. Sikorski J. Connecting worker safety to patient safety: a new imperative for health-care leaders. *Ivey Bus J*. 2009;73:8. Available at: http://ivey-businessjournal.com/publication/connecting-worker-safety-to-patient-safety-a-new-imperative-for-health-care-leaders/. Accessed June 5, 2017.
8. Cole TR, Goodrich TJ, Gritz ER, editors. *Faculty Health in Academic Medicine: Physicians, Scientists and the Pressures of Success*. New York, NY: Humana Press; 2009. p. 7.
9. Wachter RM. Patient safety at ten: unmistakable progress, troubling gaps. *Health Aff (Milkwood)*. 2010;29:165–173.
10. Yassi A, Hancock T. Patient safety—worker safety: building a culture of safety to improve healthcare worker and patient well-being. *Healthc Q*. 2005;8:32–38.
11. Stevenson RL, Moss L, Newlands T, Archer J. Safety for all: bringing together patient and employee safety. *Health Q*. 2013;16:22–26.

12. Hanskamp-Sebregts M, Zegers M, Vincent C, van Gurp PJ, de Vet HC, Wollersheim H. Measurement of patient safety: a systematic review of the reliability and validity of adverse event detection with record review. *BMJ Open*. 2016;6:e011078.

13. Sox Jr HC, Woloshin S. How many deaths are due to medical error? Getting the number right. *Eff Clin Pract*. 2000;6:277–283.

14. James JT. A new, evidence-based estimate of patient harms associated with hospital care. *J Patient Saf*. 2013;9:122–128.

15. Makary MA, Daniel M. Medical error—the third leading cause of death in the US. *BMJ*. 2016;353:i2139.

16. Abbasi J. Headline-grabbing study brings attention back to medical errors. *JAMA*. 2016;316:698–700.

17. Agency for Healthcare Research Quality. *2013 Annual Hospital-Acquired Condition Rate and Estimates of Cost Savings and Deaths Averted From 2010 to 2013*. Rockville, MD: Agency for Healthcare Research and Quality; 2015.

18. Carayon P. Sociotechnical systems approach to healthcare quality and patient safety. *Work*. 2012;41:3850–3854.

19. Gurses AP, Ozok AA, Pronovost PJ. Time to accelerate integration of human factors and ergonomics in patient safety. *BMJ Qual Saf*. 2012;21:347–351.

20. US Department of Labor, Bureau of Labor Statistics. Employment Projections 2014-24. Available at: https://www.bls.gov/news.release/pdf/ecopro.pdf. Accessed June 5, 2017.

21. Yassi A, Gilbert M, Cvitkovich Y. Trends in injuries, illnesses, and policies in Canadian healthcare workplaces. *Can J Public Health*. 2005;96:333–339.

22. Occupational Safety and Health Administration. Caring for Our Caregivers. Facts about Hospital Worker Safety; 2013. Available at: https://www.osha.gov/dsg/hospitals/documents/1.2_Factbook_508.pdf. Accessed June 5, 2017.

23. Shanafelt TD, Hasan O, Dyrbye LN, et al. Changes in burnout and satisfaction with work-life balance in physicians and the general US working population between 2011 and 2014. *Mayo Clinic Proc*. 2015;90:1600–1613.

24. Gómez-Urquiza JL, Monsalve-Reyes CS, San Luis-Costas C, Fernández-Castillo R, Aguayo-Estremera R, Cañadas-de la Fuente GA. Risk factors and burnout levels in primary care nurses: a systematic review. *Aten Primaria*. 2017;49:77–85.

25. Oreskovich MR, Shanafelt T, Dyrbye LN, et al. The prevalence of substance use disorders in American physicians. *Am J Addict*. 2015;24:30–38.

26. Suzuki K, Ohida T, Kaneita Y, et al. Mental health status, shift work, and occupational accidents among hospital nurses in Japan. *J Occup Health*. 2004;46:448–454.

27. Rogers AE, Hwang WT, Scott LD, Aiken LH, Dinges DF. The working hours of hospital staff nurses and patient safety. *Health Aff (Millwood)*. 2004;23:202–212.

28. Shanafelt TD, Balch CM, Bechamps G, et al. Burnout and medical errors among American surgeons. *Ann Surg*. 2010;251:995–1000.

29. Shanafelt TD, Raymond M, Kosty M, et al. Satisfaction with work-life balance and the career and retirement plans of US oncologists. *J Clin Oncol*. 2014;32:1127–1135.

30. Shanafelt T, Sloan J, Satele D, Balch C. Why do surgeons consider leaving practice? *J Am Coll Surg*. 2011;212:421–422.

31. Nicklin W, McVeety JE. Canadian nurses' perceptions on patient safety in hospitals. *Can J Nurs Leadersh*. 2002;15:11–21.

32. American Nurses Association. ANA Health and Safety Survey; 2011. Available at: http://www.nursingworld.org/MainMenuCategories/WorkplaceSafety/Healthy-Work-Environment/Work-Environment/2011-HealthSafetySurvey.html. Accessed June 5, 2017.

33. Hall LH, Johnson J, Watt I, Tsipa A, O'Connor DB. Healthcare staff wellbeing, burnout, and patient safety: a systematic review. *PLoS ONE*. 2016;11:e0159015.

34. Scheepers RA, Boerebach BC, Arah OA, Heineman MJ, Lombarts KM. A systematic review of the impact of physicians' occupational well-being on the quality of patient care. *Int J Behav Med*. 2015;22:683–698.

35. Panagioti M, Panagopoulou E, Bower P, et al. Controlled interventions to reduce burnout in physicians. A systematic review and meta-analysis. *JAMA Intern Med*. 2017;177:195–205.

36. Welp A, Meier LL, Manser T. The interplay between teamwork, clinicians' emotional exhaustion, and clinician-rated patient safety: a longitudinal study. *Crit Care*. 2016;20:110.

37. Taylor N, Clay-Williams R, Hogden E, Braithwaite J, Groene O. High performing hospitals: a qualitative systematic review of associated factors and practical strategies for improvement. *BMC Health Serv Res*. 2015;15:244.

38. Stalpers D, de Brouwer BJ, Kaljouw MJ, Schuurmans MJ. Associations between characteristics of the nurse work environment and five nurse-sensitive patient outcomes in hospitals: a systematic review of literature. *Int J Nurs Stud*. 2015;52:817–835.

39. DiCuccio MH. The relationship between patient safety culture and patient outcomes: a systematic review. *J Patient Saf*. 2015;11:135–142.

40. Stone PW, Hughes R, Dailey M. Creating a safe and high-quality health care environment. In: Hughes RG, editor. *Patient Safety and Quality: An Evidence-Based Handbook for Nurses*. Rockville, MD: Agency for Healthcare Research and Quality; 2008. p. 21.

41. The Health Foundation. Evidence Scan: Does Improving Safety Culture Affect Patient Outcomes? 2011. Available at: http://www.health.org.uk/sites/health/files/DoesImprovingSafetyCultureAffectPatientOutcomes.pdf. Accessed June 5, 2017.

42. Xie A, Carayon P. A systematic review of human factors and ergonomics (HFE)-based healthcare system redesign for quality of care and patient safety. *Ergonomics*. 2015;58:33–49.

43. Lundstrom T, Pugliese G, Bartley J, et al. Organizational and environmental factors that affect worker health and safety and patient outcomes. *Am J Infect Control*. 2002;30:93–106.

44. Agency for Healthcare Research and Quality Patient Safety Network. Fatigue, Sleep Deprivation, and Patient Safety; 2016. Available at: https://psnet.ahrq.gov/primers/primer/37/fatigue-sleep-deprivation-and-patient-safety. Accessed June 5, 2017.

45. Caruso C. Negative impacts of shiftwork and long work hours. *Rehabil Nurs*. 2014;39:16–25.

46. Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health. Total Worker Health. Essential Elements of Effective Workplace Programs and Policies for Improving Worker Health and Wellbeing. Available at: www.cdc.gov/niosh/twh/essentials.html. Accessed June 5, 2017.

47. Loeppke R, Hohn T, Baase C, et al. Integrating health and safety in the workplace: how closely aligning health and safety strategies can yield measurable benefits. *J Occup Environ Med*. 2015;5:585–595.

48. Occupational Safety and Health Administration. Toxic and Hazardous Substances. Hazard Communication. 1910.1200. Available at: www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=standards&p_id=10099. Accessed June 6, 2017.

49. Occupational Safety and Health Administration. Toxic and Hazardous Substances. Bloodborne Pathogens. 1910.1030. Available at: www.osha.gov/pls/oshaweb/owadisp.show_document?p_id=10051&p_table=STANDARDS. Accessed June 6, 2017.

50. Occupational Safety and Health Administration. Infectious Diseases [web site]. Available at: https://www.osha.gov/SLTC/healthcarefacilities/infectious_diseases.html. Accessed June 6, 2017.

51. Occupational Safety and Health Administration. Safe Patient Handling [web site]. Available at: https://www.osha.gov/SLTC/healthcarefacilities/safepatienthandling.html. Accessed June 6, 2017.

52. Occupational Safety and Health Administration. Ergonomics [web site]. Available at: https://www.osha.gov/SLTC/ergonomics/. Accessed June 6, 2017.

53. National Institute for Occupational Safety and Health. NIOSH Alert: Preventing Occupational Exposures to Antineoplastic and Other Hazardous Drugs in Health Care Settings. Available at: https://www.cdc.gov/niosh/docs/2004-165/pdfs/2004-165.pdf. Accessed June 6, 2017.

54. Loeppke R, Edington DW, Bég S. Impact of the prevention plan on employee health risk reduction. *Popul Health Manag*. 2010;13:275–284.

Appendix I: BEST PRACTICES—EXAMPLES OF SUCCESSFUL PROGRAMS

Listed below are questions posed to several health systems to provide information on their health care worker health and safety programs and the impact of these programs on patient safety. Highlights from each program are provided.

1. Focus area and applicability/subject area or theme
2. Title
3. Description of successful practice
   a. Most important process changes
   b. Program or action plan
   c. Why is there a need for this? Value of it?
   d. What do you need?
      i. People, equipment, materials, etc.
      ii. Cost?
4. Why is this a successful practice?
   a. Situation before (problem)
   b. Situation after (solution)
   c. Benefits
      i. Quantify if possible cost, quality, timeliness, satisfaction as benefits and results achieved
   d. Any non-measurable results – positive or negative?

e. Key lesson learned
   i. What must be in place for the successful practice to be effective?
f. How widely deployed?
g. Applicability for other functions and programs (objective of successful practice is to enable other people/ departments to copy with least possible effort)?
   i. SWOT analysis
   ii. Suggestions for other agencies with similar program?

University of California (UC)

The University of California's Work Strong (WS) program was launched in 2012 to lower employee personal health risks, such as smoking, obesity, poor nutrition, and lack of exercise among repeat-injured workers in an effort to address workers' compensation costs and reduce future multiple claims. Employees selected for the WS program participate in a variety of behavior modification activities, ranging from life coaching to smoking cessation and other wellness services, including personal fitness coaching and meetings with registered dieticians. A typical program—which on average takes 21 weeks to complete—includes 16 to 22 personal fitness-training sessions, 6 to 10 consultations with a dietitian, and a free 6-month gym membership. Through April 2017, there were 1821 employees enrolled with 1047 having graduated and the balance still in the program. UC-wide data show WS graduates (as of April 30, 2017) have 28% less workers' compensation actual claim cost since program inception than expected. Participation studies and hundreds of testimonials from WS participants of patient health data indicate that WS enrollees have reaped a wide range of added benefits from the program—physical, mental, and work performance and engagement, at the same time it has reduced workers' compensation costs.

Dartmouth Hitchcock Medical Center

Dartmouth Hitchcock Medical Center's Safety Wellness Action Team (SWAT) was developed to reduce the number and severity of work-related injuries and to improve the well-being of employees in high-risk units and work groups. First, the at-risk department is identified by the prevalence of work-related incidents combined with patient safety and quality indicators. A work-group dashboard of employee and patient safety problems is constructed for presentation to the workgroup's leadership. After initial discussion with leadership, the data are reviewed with the local safety committee. Surveys are then

distributed to the local safety committee to collect ideas about what may be the cause of the extraordinary incidence of employee and patient safety events. The local safety committee discusses and takes responsibility for distributing the same surveys to the rest of the unit or work group. The results of these surveys are reviewed and the local safety committee identifies target issues, works with employee health and safety resources, plans the interventions, and then implements the interventions. This program was piloted on a unit with a high rate of work-related injuries and illnesses and a high rate of falls. Initially, there was a reduced rate of work-related injuries and illnesses and rate of falls. However, rates have since increased and are now similar to original rates. As a result of these efforts, there has been an increased culture of health and safety and increased job satisfaction at Dartmouth Hitchcock.

Vanderbilt University and Vanderbilt University Medical Center

Vanderbilt University and Vanderbilt University Medical Center utilize Work/ Life Connections-EAP (WLC), an internal employee assistance program (EAP), to provide psychological support for faculty and staff and promote problem-solving and stress resilience through counseling, coaching, and consultation. The EAP is a division of Occupational Health and Wellness at Vanderbilt, the umbrella organization that also includes an occupational health clinic and Health Plus, Vanderbilt's health promotion and prevention program. While the majority of clients (more than 95%) seen through WLC are voluntary referrals, about 10% have a mandatory referral when it is determined to be a business necessity due to safety concerns or performance-based issues. In FY 2016, 170 clients who were mandatory referrals were seen for behavioral performance coaching for workplace issues and approximately 90% of these clients showed significant behavioral improvement within the year following intake.

Professional conduct policies and a credo are used to describe professional behaviors and what is expected of faculty and staff at Vanderbilt. Both leader-assessment of goals and observation of practice are part of faculty and staff annual evaluations—a tool to identify those in need of behavioral improvement. Electronic reporting systems identify patterns of problematic behavior suggesting an opportunity for improvement. These systems also provide confidential input from customers and employees. After evaluation, leadership offers employees (physicians, nurses, faculty, or staff members) the opportunity to improve a skill-set through performance

coaching. The Vanderbilt system also alerts leaders about incidents that might benefit from a critical-incident stress management intervention in order to support faculty, physicians, nurses, and staff. In FY16, WLC provided 49 post-event interventions to 533 participants.

University of Virginia Health System

The University of Virginia (UVA) Health System has implemented a BeWell program in order to improve employee health and well-being and to also improve absenteeism and employee engagement. The BeWell program includes a customized and dedicated web portal to support the program and to report metrics; a medical registry; a Patient Advocate for each employee, who assists in the development of an individualized prevention plan (knowledge of health risks and suggestions to reduce those risks); an online Health and Well-being Assessment (HWA); virtual and in-person coaching; depression screening, and other proactive services to enhance health. The BeWell program is currently deployed to 5000 of UVA's 30,000 covered employees and will be deployed to all 30,000 by January 2018. To date, UVA has seen improved patient outcomes, improved employee engagement, and improvement in non-scheduled days away from work. As a result of its employee-health efforts, UVA has reduced specialty drug spending by $780,000 and achieved other system-related cost savings.

Bon Secours Health System

Along with improving the health status of its workers, Bon Secours has launched an initiative to drive employee resiliency and promote a culture of caring and mindfulness. In order to reduce employee stress and burnout, Bon Secours implemented its *Stress Free Now for Healers* program. *Stress Free Now for Healers* was developed by nurses and doctors at Cleveland Clinic and is an evidenced-based program designed to improve symptoms associated with stress as well as help to reduce employee burnout and improve resiliency. This web-based program includes educational content along with a health coach who communicates with participants by email. The program is self-paced and provides structured content, such as mindful meditation, over a 6-week time frame. Concepts such as mindfulness have been adopted by Bon Secours, along with other tools that help health care workers in its system manage stress more effectively. To encourage engagement with nurses and physicians, the system offers CME and CNE credits for participation in various components of the program. As of

September 2016, *Stress Free Now for Healers* is available to all employees across Bon Secours nationally.

The program uses several research based tools to measure perceived stress, burnout, and resiliency. Postprogram measurements have consistently shown improvement in all areas—that is, decreases in emotional exhaustion, decreases in perceived stress, and increases in a sense of personal accomplishment. For example, 69% of participants rated their perceived stress as high to very high at week 0 of the program, but at week 8, 18% perceived their stress as high to very high; 67% of participants had moderate to high emotional exhaustion at week 0, but this decreased to 37% by week 8.

Follow-up sustainability studies depicting similar outcomes have also been shown at 4, 7, and 15 month intervals post-intervention. Bon Secours leadership believes that the elements of its employee health and wellness efforts link too many outcomes, including patient safety, patient outcomes, turnover, and employee engagement.