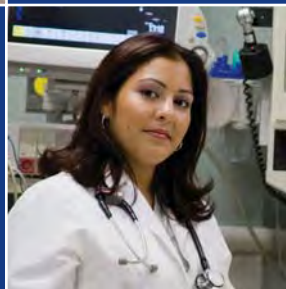


Improving Patient and Worker Safety

Opportunities for Synergy, Collaboration and Innovation



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Health care professionals whose focus is on patient safety are very familiar with these alarming and frequently cited statistics from the Institute of Medicine: medical errors result in the death of between 44,000 and 98,000 patients every year. Health care professionals whose focus is on occupational health and safety, however, are likely aware of additional statistics that are less well known: health care workers experience some of the highest rates of nonfatal occupational illness and injury—exceeding even construction and manufacturing industries.

What do these statistics tell us about safety for both patients and workers in the health care environment? Is there a connection between worker safety and patient safety? Are there synergies between the efforts to improve patient safety and efforts to improve worker safety? How can improvement efforts be coordinated for the benefit of all?

This monograph is intended to stimulate greater awareness of the potential synergies between patient and worker health and safety activities. Using actual case studies, it describes a range of topic areas and settings in which opportunities exist to improve patient safety and worker health and safety activities. This monograph is designed to bridge safety-related concepts and topics that are often siloed within the specific disciplines of patient safety/quality improvement and occupational health and safety.

This monograph includes information about the following:

- High reliability in health care organizations and benefits to improving safety for both patients and workers
- Management principles, strategies, and tools that advance patient and worker safety and contribute to high reliability
- Specific case examples of activities and interventions to improve safety
- Key themes and action steps to meet challenges and achieve success

This monograph was developed in collaboration with the National Institute for Occupational Safety and Health (NIOSH), National Occupational Research Agenda (NORA) Healthcare and Social Assistance Sector Council and supported in part by a contract from this program.

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The Joint Commission Mission

The mission of The Joint Commission is to continuously improve health care for the public, in collaboration with other stakeholders, by evaluating health care organizations and inspiring them to excel in providing safe and effective care of the highest quality and value.

Disclaimer

This monograph was developed under a project supported in part by the National Institute for Occupational Safety and Health (NIOSH), National Occupational Research Agenda (NORA), Healthcare and Social Assistance Sector Program, under contract no. 212-2010-M-35609. The goal of the project is to stimulate greater awareness of the potential synergies between patient and worker health and safety activities. This monograph is designed to introduce concepts and topics but is not intended to be a comprehensive source of all relevant information relating to patient and worker safety topics and resources in health care settings. The monograph is not designed to provide guidance on compliance with OSHA regulations, state legislative requirements, or Joint Commission standards. Readers should refer to the source documents listing requirements from the respective organizations for guidance on compliance issues. Similarly, recommendations for practice described herein should not be construed as policy or practice recommendations from The Joint Commission. Although many suggestions and recommendations are derived from literature and consensus, they should not necessarily be considered evidence-based because of the limited amount of rigorous research in this area.

The content and recommendations are solely the responsibility of the Joint Commission project staff and others who contributed material. We have worked to ensure that this monograph contains useful information, but this monograph is not intended to be a comprehensive source of all relevant information. In addition, because the information contained herein is derived from many sources, The Joint Commission cannot guarantee that the information is completely accurate or error-free. The Joint Commission is not responsible for any claims or losses arising from the use of, or from any errors or omissions in, this monograph.

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Foreword

Safety is avoiding both short- and long-term harm to people resulting from unsafe acts and preventable adverse events. This definition does not differentiate among patients, their families, staff and licensed independent practitioners, visitors, vendors and contractors, or anyone else within a health care setting. And yet, many health care organizations have “siloe” safety programs, creating one for patients, another for workers, and yet another for others who may be at risk. These siloe programs are usually also administered separately—by clinical, human resource, and general liability personnel, respectively—and the information and solutions these programs generate are not shared among them. What a loss!

This monograph demonstrates why these different safety programs should not—indeed, cannot—be separated. The organizational culture, principles, methods, and tools for creating safety are the same, regardless of the population whose safety is the focus. In fact, the same principles, methods, and tools may be separately used by different groups (clinical, human resource, and general liability personnel) within an organization. But it is not possible to generate and maintain a culture of safety that encompasses only one or two of these groups. A culture of safety comprises trust in being treated justly when an adverse event (or close call) occurs and is reported; the obligation and willingness to report adverse events and near misses; and reliable, effective improvement in response to the reports. However, a culture of safety—and the organization leaders who create and sustain it—will not be considered legitimate and genuine if the culture excludes some groups within the organization. And, if an organization’s culture of safety is not consid-

ered legitimate and genuine, it will not be valued and accepted—nor will it facilitate improved safety throughout the organization.

But the need to create an organizationwide culture of safety is not the only reason for breaking down the barriers between patient safety and worker safety. As the chapters and case studies herein demonstrate, hazards, close calls, and adverse events that affect one group (patients) may bring to light risks that will also endanger another group (workers), since the underlying causes—and, therefore, solutions—are often the same. Failure to share the learning that occurs in different contexts (within different groups and in different sites) compromises an organization’s ability to efficiently and effectively improve safety for all those within the organization.

Although the reader may be personally invested in achieving the synergy between patient safety and worker safety activities that is described in this monograph, often, enlisting others in the cause is the first step in helping an organization change. And convincing others is often as dependent on the *story* told as on the *facts* presented. The story gives the facts meaning. The extensive case studies presented here tell the story, not just the facts. Therefore, they do more than merely demonstrate *how* the safety programs in an organization can be integrated. They also explain *why* these programs should be seamlessly woven together.

One often hears concerns about the “return on investment”—the ROI—of patient safety activities. Their resource use may be great, but their financial return is difficult to measure. The same can be said about investment in staff safety. But the *value* of any invest-

ment should be related to its *business case*, which is not limited to the financial ROI. The business case for any activity includes the following three components:

1. The activity's contribution to achieving the organization's mission(s)
2. The activity's contribution to stakeholders' (patients, staff) satisfaction
3. The activity's contribution to the bottom line (the ROI).

All these components are relevant, and no one component alone determines the *value* of the investment in an activ-

ity. Activities to improve safety are strong contributors to #1 and #2, and being efficient and effective in conducting these activities contributes to #3—the ROI. The integration and synergy described in this monograph can contribute to the efficiency and effectiveness of safety-related activities.

In health care, the primary ethical imperative is “First, do no harm.” Although we have traditionally applied this obligation to our patients, this monograph helps to establish it also as our obligation to those with whom we work—and to all within the health care setting.

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Introduction

Health care professionals whose focus is on patient safety are very familiar with these alarming and frequently cited statistics: Medical errors result in the death of between 44,000 and 98,000 patients every year.¹ First released in the 1999 landmark report by the Institute of Medicine, *To Err Is Human, Building a Safer Health System*, these numbers captured the attention of health care leaders and spearheaded a widely publicized patient safety movement over the past two decades. That movement continues today.

Health care professionals whose focus is on occupational health and safety, however, are likely aware of additional statistics that are less well known: Health care workers experience some of the highest rates of nonfatal occupational illness and injury—exceeding even construction and manufacturing industries.^{2,3} Furthermore, a recent report based on health care claims data indicates that hospital workers have higher health risks and are more likely to be diagnosed and hospitalized for chronic medical conditions.⁴

What do these statistics tell us about safety for both patients and workers in the health care environment? Is there a connection between worker safety and patient safety? Are there synergies between the efforts to improve patient safety and efforts to improve worker safety? According to Merriam-Webster, *synergy* is a mutually advantageous conjunction or compatibility of distinct business participants or elements.⁵ How can improvement efforts be coordinated for the benefit of all?

This monograph will explore these pressing issues.

Monograph Purpose

This monograph is intended to stimulate greater awareness of the potential synergies between patient and worker health and safety activities. It will describe a range of topic areas and settings in which synergies exist between patient safety and worker health and safety activities. The monograph will also describe the importance of safety culture and why high reliability organizations are concerned with safety for both patients and health care workers.

In addition, the monograph will do the following:

- Highlight examples of health care organization practices that address patient and worker safety simultaneously and the benefits and potential cost savings attained through collaboration between employee and patient safety departments.
- Identify structural and functional management systems and processes that have been used to successfully integrate health and safety activities.

- Describe barriers to recognizing and addressing patient and worker safety issues and suggest strategies for overcoming the barriers by making safety a priority.
- Recommend action steps that health care organizations can take to improve safety for both patients and workers.
- And, finally, the monograph will identify topics for future research.

You will also find examples of resources for additional information at the end of sections.

Monograph Parameters

This monograph is designed to bridge safety-related concepts and topics that are often siloed within the specific disciplines of patient safety/quality improvement and occupational health and safety. Toward that end, there are occasional differences in terminology that are addressed directly in the text or the glossary. One overarching semantic issue relates to the term *safety*. The occupational health field distinguishes between *safety* and *health* such that worker safety refers to injury prevention, and worker health refers to disease prevention and health promotion.⁶ By contrast, within the patient safety field, the short-term and long-term health effects on patients associated with unsafe acts and events are included by implication within the term *patient safety*. For the purpose of the monograph, the use of the term *safety* will include short-term and long-term health effects for both workers and patients.

The monograph is *not* intended to be a comprehensive source of all relevant information relating to patient and worker safety topics and resources in health care settings. Many of the examples in this monograph come from self-reported methods, tools, and data submitted by health care organizations for a roundtable meeting on synergies between patient and worker safety, which was held July 26, 2011, and included representatives from leading health care safety organizations. The examples also derive from published literature.

The monograph is *not* designed to provide guidance on compliance with OSHA regulations, state legislative requirements, or Joint Commission standards. Readers should refer to the source documents listing requirements from the respective organizations for guidance on compliance issues. Similarly, recommendations for practice described herein should not be construed as policy or practice recommendations from The Joint Commission. The content and recommendations are solely the responsibility of The Joint

Commission project staff and others who contributed material. As described in Chapter 4, although many suggestions and recommendations are derived from literature and consensus, they should not be considered evidence based because of the limited amount of rigorous research in this area.

Target Audience

The information provided herein addresses a wide range of health care organizations across settings and services. It will be of interest to anyone in health care organizations involved with patient and worker safety, including but not limited to the following: administrative and clinical leaders, quality improvement professionals, infection preventionists, risk managers, occupational health practitioners, environmental health and safety staff, patient safety staff, financial planners, and human resource personnel.

Roundtable Project Overview

Based on the notion that high reliability health care organizations are focused on safety for both patients and health care workers, The Joint Commission undertook a project to identify and disseminate examples of effective practices that integrate safety-related activities. These examples, which span health care settings, improve processes and outcomes for both patients and health care workers. This project was supported in part by the National Institute for Occupational Safety and Health (NIOSH), National Occupational Research Agenda (NORA), Healthcare and Social Assistance Sector Program, under contract no. 212-2010-M-35609.

The first step was to conduct a national call to solicit effective worker/patient safety practices in a wide range of relevant topics. These topics included, but were not limited to the following: worker and patient safety culture, worker and patient satisfaction, injury prevention, infection prevention, performance improvement, and individual engagement in safety activities. The Joint Commission conducted this call in the last quarter of 2010. More than 35 submitted practice examples were reviewed by a subgroup of the NORA Healthcare and Social Assistance Sector Council to identify examples not only from a variety of topic areas but also from a range of health care settings. Criteria for selection included practices with evidence of effectiveness; practices that likely integrate leadership and functional responsibility for safety training, surveillance, and management systems; and practices likely to improve safety and/or outcomes for both workers and patients.

The next step was to convene a one-day invitational roundtable meeting comprising thought leaders and high-performing health care organizations. The goal of the roundtable was to identify key concepts and topic areas highlighting the overlap and complementary nature of patient safety and worker health and safety activities. The information gained at the roundtable meeting, held on July 26, 2011, at The Joint Commission headquarters in Oakbrook Terrace, Illinois, became the foundation for this monograph. Several of the submitting organizations were invited to attend the invitational roundtable and selected practice examples are included as case studies here (see Table I-1 on pages 4–5).

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– Chapter 1 –

High Reliability in Health Care Organizations and Benefits to Improving Safety for Both Patients and Workers

This chapter makes the case that high reliability health care organizations should be intensely concerned with safety for both patients and workers. It describes the importance of a safety culture and discusses the potential value of investing in both patient and worker safety. The chapter also provides a case example of leading-edge practices that actively integrate patient and worker safety in pursuit of high reliability.

1.1 What Is a High Reliability Organization?

High reliability organizations (HROs) have been described as “systems operating in hazardous conditions that have fewer than their fair share of adverse events.”^{1(p.769)} Outside of health care, examples of industries or organizations often considered to be highly reliable are nuclear power, aircraft carriers, and air traffic control. According to Reason, one of the most important distinguishing features of HROs is their intense concern (often referred to in the literature as “pre-occupation”) with the possibility of failure.¹ They recognize the inherent fallibility in humans as well as the risk of system failure associated with equipment and devices used in tightly inter-related (coupled) work processes. HROs strive to create systems and processes that prevent errors or mitigate their impact. They value identifying and reporting potential and actual problems and treat adverse occurrences as opportunities for learning and improvement.² Weick and colleagues describe the following five organizational culture characteristics that contribute to a “collective mindfulness” regarding error prevention: (1) preoccupation with failure, (2) reluctance to simplify interpretations, (3) sensitivity to operations, (4) commitment to resilience, and (5) under-specification of structures (see Figure 1-1, page 8). This mindfulness requires both constant awareness and willingness to take action on the part of all staff.³

Henriksen et al applied the Weick organizational culture characteristics to activities relevant to nurses and other health care workers (see Table 1-1, page 9).⁴

1.2 High Reliability in Health Care

A well-known definition of *reliable* is “giving the same result on successive trials.”⁵ However, the *same* result is not necessarily the *correct* result (as exemplified by a yardstick that is only two feet long). In health care and other industries, the term *reliability* typically encompasses both getting the same result and getting the correct result. For example, the Institute for Healthcare Improvement (IHI) defines reliability in health care as “failure-free operation over time.”⁶ Reliability can be calculated as the inverse of the failure or defect rate. For example, if a process such as timely administration of antibiotic fails 1 in every 10 cases, the failure rate is 10^{-1} or 10%, and the reliability is 90%. By comparison, Six Sigma levels of reliability (the same as six standard deviations) refer to processes that fail no more than 3.4 times over a million opportunities (3.4 defects per million units): In other words, a 0.00034% failure rate means the process is 99.966% reliable.⁷ Six Sigma levels of reliability are typically achieved in the airline and credit card industries but very rarely in health care. However, one often-cited health care example is the

death rate associated with anesthesia, which has been reduced to Six Sigma levels of reliability by concerted attention to safety over several decades by the Anesthesia Patient Safety Foundation and related groups.⁸ Amalberti et al. describe five systemic barriers to achieving extremely high levels of safety in health care.⁹

The landmark 2001 Institute of Medicine report *Crossing the Quality Chasm: A New Health System for the 21st Century* states the following:

Threats to patient safety are the end result of complex causes such as faulty equipment; system design; and the interplay of human factors, including fatigue, limitations on memory, and distraction. The way to improve safety is to learn about causes of error and use this knowledge to design systems of care so as to prevent error when possible, to make visible those errors that do occur (so they can be intercepted), and to mitigate the harm done when an error does reach the patient.^{10(p.78)}

Toward that end, IHI promotes the following three-step model for reducing errors and improving reliability in health care systems:

1. Prevent failure (a breakdown in operations or functions).

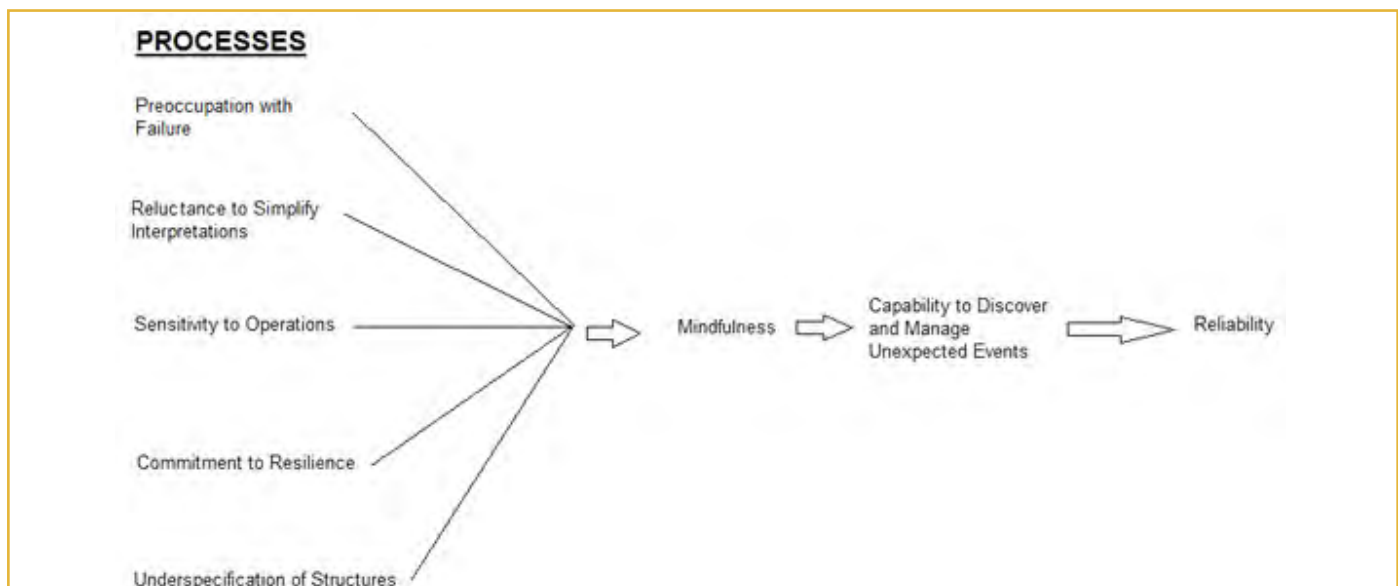


Figure 1-1: A Mindful Infrastructure for High Reliability

Source: Weick KE, Sutcliffe KM, Obstfeld D. Organizing for high reliability: Processes of collective mindfulness. *Res Organizational Behav.* 1999; 21(s 81):23–81. Used with permission.

Table 1-1: A State of Mindfulness for Nurses

Core Process	Explanation/Implication for Nursing
Preoccupation with failure	Adverse events are rare in HROs, yet these organizations focus incessantly on ways the system can fail them. Rather than letting success breed complacency, they worry about success and know that adverse events will indeed occur. They treat close calls as a sign of danger lurking in the system. Hence, it is a good thing when nurses are preoccupied with the many ways that things can go wrong and when they share that “inner voice of concern” with others.
Reluctance to simplify interpretations	When things go wrong, less reliable organizations find convenient ways to circumscribe and limit the scope of the problem. They simplify and do not spend much energy on investigating all the contributing factors. Conversely, HROs resist simplified interpretations, do not accept conventional explanations that are readily available, and seek out information that can disconfirm hunches and popular stereotypes. Nurses who develop good interpersonal, teamwork, and critical-thinking skills will enhance their organization’s ability to accept disruptive information that disconfirms preconceived ideas.
Sensitivity to operations	Workers in HROs do an excellent job of maintaining a big picture of current and projected operations. Jet fighter pilots call it situational awareness; surface Navy personnel call it maintaining the bubble. By integrating information about operations and the actions of others into a coherent picture, they are able to stay ahead of the action and can respond appropriately to minor deviations before they result in major threats to safety and quality. Nurses also demonstrate excellent sensitivity to operations when they process information regarding clinical procedures beyond their own jobs and stay ahead of the action rather than trying to catch up to it.
Commitment to resilience	Given that errors are always going to occur, HROs commit equal resources to being mindful about errors that have already occurred and to correct them before they worsen. Here the idea is to reduce or mitigate the adverse consequences of untoward events. Nursing already shows resilience by putting supplies and recovery equipment in places that can be quickly accessed when patient conditions go awry. Since foresight always lags hindsight, nursing resilience can be honed by creating simulations of care processes that start to unravel (e.g., failure to rescue).
Deference to expertise	In managing the unexpected, HROs allow decisions to migrate to those with the expertise to make them. Decisions that have to be made quickly are made by knowledgeable frontline personnel who are closest to the problem. Less reliable organizations show misplaced deference to authority figures. While nurses, no doubt, can cite many examples of misplaced deference to physicians, there are instances where physicians have assumed that nurses have the authority to make decisions and act, resulting in a diffusion of responsibility. When it comes to decisions that need to be made quickly, implicit assumptions need to be made explicit; rules of engagement need to be clearly established; and deference must be given to those with the expertise, resources, and availability to help the patient.

Abbreviation: HRO = High reliability organization

Source: Henriksen K, et al. Understanding adverse events: A human factors framework. In Hughes RG, editor: Patient Safety and Quality: An Evidence-Based Handbook for Nurses. Rockville (MD): Agency for Healthcare Research and Quality (US), 2008 Apr; Chapter 5. PubMed PMID: 21328766.

- Identify failure when it occurs and mitigate it (intercede) before harm is caused or when failure is not detected.
- Redesign the process based on the critical failures identified.⁶

All three of these steps are integral to the concepts described in this monograph and will be highlighted in the case examples.

1.3 The Importance of a Safety Culture

Chassin and Loeb describe the following three interdependent, essential changes that health care organizations must undergo to become highly reliable¹¹:

- Leadership must commit to the goal of high reliability.

2. An organizational culture that supports high reliability must be fully implemented.
3. The tools of robust process improvement must be adopted.

The second point, the importance of an organizational culture that supports high reliability, deserves special attention. Briefly, in the last two decades there has been an explosion of research on the impact of organizational culture in preventing errors in both patient safety and worker safety.^{12–17} Studies have looked for associations between culture and a variety of staff outcomes such as turnover, satisfaction, and injury rates, as well as patient outcomes such as satisfaction, condition-specific functional status, infection rates, and mortality rates.

Though terminology varies across fields, Stone et al.¹⁶ and Gershon et al.¹⁸ provide concise descriptions of the differences between the often-used terms *organizational culture*, *climate*, and *safety culture*. *Organizational culture* refers to the deeply embedded norms, values, beliefs, and assumptions shared by members of an organization. These evolve over time and are difficult to change. *Climate*, by contrast, refers to the shared perceptions at a given point in time regarding organizational practices such as decision making, advancement opportunities, and so on. These are more amenable to change. *Safety culture/safety climate* is a subset (or microclimate) of overall organizational climate that focuses on people's perceptions about the extent to which the organization values safety (for workers, patients, and/or the environment), commits

resources to safety-related initiatives and equipment, and promotes safe behaviors. Safety climate can serve as a leading indicator of safety performance, in contrast to error and injury rates, which are lagging indicators of performance.

As with all improvement activities, it is essential to measure performance before and after trying to improve it. In fact, hospitals and other organizations that are accredited by The Joint Commission are expected to regularly evaluate the culture of safety and quality using valid and reliable tools.¹⁹ Many valid and reliable safety and organizational culture instruments are available to measure safety culture. According to review articles by Gershon et al.,¹⁸ Colla et al.,²⁰ and Sammer et al.²¹ safety culture assessment tools addressing worker or patient safety tend to focus on the dimensions shown in Table 1-2. Though the practice of measuring safety culture/climate is widespread, challenges remain regarding construct validation and the appropriateness of using comparative information on safety culture.^{22,23}

Safety culture is known to vary widely across organizations, and performance on the specific domains varies within organizations. For example, it is conceivable that hospitals may score high on dimensions related to patient safety but low on worker safety. Similarly, studies have shown that perception of culture varies between departments and units within organizations (for example, ICUs may have a stronger safety culture than medical/surgical floors) and by type of respondent (physicians may have higher perceptions of safety culture than nurses).²⁴

Table 1-2: Common Dimensions Across Safety Culture Tools

Major Dimensions	Examples of Topic Areas: Worker Safety Culture Tools	Examples of Topic Areas: Patient Safety Culture Tools
Leadership and management	Leadership and management support for staff safety; degree of supervision, leadership hierarchy, policies and procedures	Perceptions of management; leadership and management support for patient safety; nonpunitive response to errors, policies, and procedures; adequacy of training
Group behaviors and relationships	Workgroup relations, conflict vs. cooperation, social relations, coworker trust, supportiveness	Teamwork within and across units; quality of hand-offs and transitions
Communications	Openness of communication, formal and informal methods, conflict resolution approaches	Feedback and communication about error; reporting mechanisms
Quality of work life: structural attributes; working conditions	Staffing adequacy, job satisfaction, team satisfaction, security; work pressure, rewards, job security, forced overtime, benefits	Staffing adequacy, job satisfaction, team satisfaction; resource availability; stress recognition

Measuring safety culture is actually the easier part; changing and improving culture is much more challenging. Change takes time—perhaps months or even years—and requires specific interventions. Examples of a few interventions that have been applied to improve safety culture are described in Chapter 3 of this monograph. A recent Cochrane Collaboration systematic review of the effectiveness of strategies to change organizational culture to improve health care performance identified more than 4,000 studies based on their search criteria.²⁵ When the authors applied the inclusion criteria of randomized clinical trials and/or well-designed quasi-experimental studies, none of the studies was eligible for inclusion. Thus, the authors were unable to draw any conclusions about the effectiveness of different strategies for improving organizational culture, and they identified a major need for well-designed studies on this topic.

Finally, this chapter cannot begin to do justice to the wealth of information available on safety culture. Readers are encouraged to visit the resources listed at the end of the chapter for examples of safety culture tools and more information.

1.4 Why High Reliability Requires Attention to Both Patient and Worker Safety

HROs are deeply concerned with safety, and they value near-miss events as opportunities to learn how to improve.² This preoccupation with safety must include both patient and worker safety simultaneously, since staff working conditions are related to patient safety as well as occupational safety.²⁶ It would be expected, therefore, that HROs integrate many patient and worker safety activities—either structurally and/or functionally—within the organization.

A conceptual model (see Figure 1-2, page 12) developed by Stone and a team of interdisciplinary scholars as part of the Agency for Healthcare Research and Quality (AHRQ) research portfolio, “The Effect of Health Care Working Conditions on the Quality of Care” (RFA HS-01-005) shows the structural and process factors that affect outcomes for both workers and patients.²⁷ Some of the relationships are direct, while others are indirect. For example, leaders have a direct effect on work design and quality emphasis, which in turn indirectly affects patient outcomes. Leaders also have a direct effect on worker outcomes, such as satisfaction and intention to leave; workers then have a direct effect on patient outcomes.

The evidence that worker satisfaction and characteristics of the work environment affect patient outcomes continues to

grow. For example, McHugh et al. found that patient satisfaction levels were lower in hospitals with more nurses who are dissatisfied or burned out.²⁸ Taylor et al. found that lower perception of safety and teamwork among nurses was associated with increased odds of decubitus ulcers in patients and increased nurse injury.²⁹ The study also found that more nursing hours per patient day was associated with fewer patient falls. A review by Stone et al. includes an evidence table describing 16 earlier studies that examine the relationship between organizational climate and patient and worker outcomes.¹⁶ Interestingly, the relationship between worker outcomes and patient characteristics and outcomes is bidirectional. McCaughey and colleagues reported that health care workers who routinely care for high risk patients (for example, patients who are cognitively impaired, morbidly obese, or infected with contagious pathogens) were more likely to have poorer perceptions of safety climate and higher levels of stress.³⁰ However, organizational safety climate was found to mediate the relationship between high risk patients and worker stress.

Given that poorer safety culture and working conditions are associated with undesirable outcomes for workers, and undesirable worker outcomes are associated with poorer patient outcomes, it stands to reason that health care organizations preoccupied with safety should not focus on patient safety alone. HROs must recognize the inseparable integration of worker safety and patient safety and address worker health and safety as well as patient safety.

1.5 Potential Benefits to Improving Safety for Patients, Staff, and Organizations and Return on Investment (ROI) Considerations

There are a great many clinical and nonclinical areas, programs, and departments in which improvements can be made that simultaneously benefit workers and patients. Table 1-3, page 13, describes examples of the topics as well as interventions and outcomes that can be improved for patients, workers, and the health care organization as a whole. The topics range from well-known areas such as falls, safe patient handling, and violence prevention, to lesser-known topics such as active surveillance for environmental hazards and improving civility, respect, and teamwork.

Not all interventions require large investments of resources. For example, implementing daily huddles that focus on worker and patient safety hazards within or across units minimizes staff time and optimizes real time identification

of actual or potential problems. See Chapter 3 for more information.

Can one demonstrate an ROI for implementing these improvements? Is it really cost effective to invest in capital equipment or lengthy employee-driven process improvement initiatives that divert precious resources from patient care? Throughout this monograph, case studies highlight real-life examples of benefits and ROIs that health care organizations have experienced. Methods and approaches to calculating ROI range from relatively simple for internal use to sophisticated analyses suitable for peer-reviewed publications. See Resources 1-2, page 22, for further information.

Nevertheless, there currently is a dearth of literature on the direct and indirect financial benefits of these efforts. In a review of studies linking organizational climate to worker and patient outcomes, Stone et al. found very few studies that address the business case for improving worker and patient safety and called for further research on specific interventions and their cost effectiveness.¹⁶

One community hospital that has proactively tackled the intersection between worker and patient safety in its quest for becoming an HRO is described in Case Study 1-1 that follows on page 15.

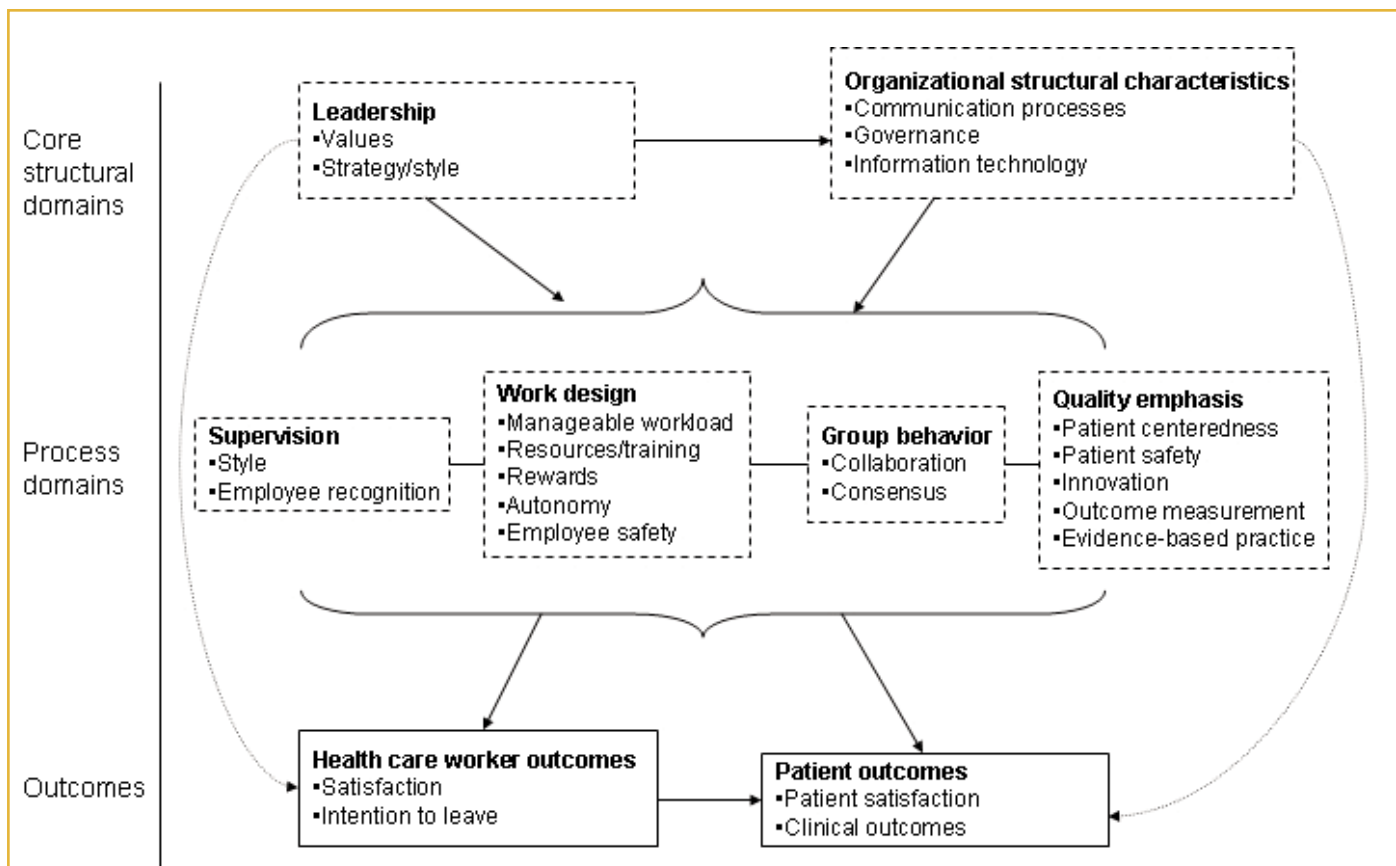


Figure 1-2: An Integrative Model of Health Care Working Conditions on Organizational Climate and Safety

Boxes outlined with dotted lines represent domains of organizational climate. Boxes outlined with solid lines represent outcomes. Core domains are in bold; subconstructs are bulleted. The dotted arrows connecting core structural domains represent direct effects on outcomes, which are mediated by the process domains.

Source: Stone PW, et al. Organizational climate of staff working conditions and safety—An integrative model. In: Henriksen K, et al. editors. *Advances in Patient Safety: From Research to Implementation (Volume 2: Concepts and Methodology)*. Rockville (MD): Agency for Healthcare Research and Quality (US); 2005 Feb. PubMed PMID: 212498253.

Table 1-3: Topic Areas for Interventions to Improve Safety and Examples of Potential Benefits to Patients, Staff, and Organizations

Intervention Focus	Examples of Strategies	Examples of Settings	Potential Benefits to Patients	Potential Benefits to Employees	Potential Benefits to the Health Care Organization
Safe patient handling	Patient lifting equipment; no-lift policies; specialized lift teams	Acute care hospitals, rehabilitation facilities, skilled nursing facilities	Increased patient satisfaction; quicker ambulation; fewer falls; improved outcomes	Increased worker satisfaction; decreased musculoskeletal injuries	Decreased worker compensation; increased staff retention; increased patient satisfaction, returns, recommendations
Fall prevention	Patient assessment; safe-transfer technique; slip-resistant flooring materials; absorbent floor mats	All	Decreased morbidity and mortality, length of stay	Fewer injuries and days away or restricted work	Decreased worker compensation costs; decreased litigation; decreased staff replacement
Sharps injury prevention	Sharps with engineered sharps injury protections; blunt suture needles to prevent needle sticks; surgical injuries; minimize hand transfers of surgical instruments	Acute and long term care hospitals, home health, ambulatory surgery	Decreased exposure to blood-borne pathogens	Decreased exposure to blood-borne pathogens	Decreased worker compensation claims, insurance costs; decreased litigation; improved safety culture
Infection prevention	Health care worker immunization; hand hygiene; standard precautions; personal protective equipment	All	Decreased transmission of organisms from workers to patients and patients to patients	Decreased transmission of organisms from patients to workers	Increased adherence to guidelines; fewer sick days; lower externally reported infection rates; less risk of financial penalties in pay-for-performance initiatives
Assault and violence prevention and management	Frontline staff and security staff training; track patients with history of disruptive behavior	All	Fewer injuries and adverse events; less use of restraints	Fewer injuries; less anxiety; improved teamwork; improved satisfaction	Lower staff turnover, litigation; improved safety culture
Security in the neighborhood and facility	Lights, locks, video surveillance; training on threat recognition	Home health, hospitals, nursing homes	Patients less fearful of violence in parking areas, facilities	Providers maintain patient base; greater sense of security	Lower staff turnover; improved safety culture

Table 1-3: Topic Areas for Interventions to Improve Safety and Examples of Potential Benefits to Patients, Staff, and Organizations (continued)

Intervention Focus	Examples of Strategies	Examples of Settings	Potential Benefits to Patients	Potential Benefits to Employees	Potential Benefits to the Health Care Organization
Prevent exposure to hazardous drugs	Ventilated cabinets; closed-system transfer devices; needleless systems; administrative controls; proper personal protective equipment	Acute care, pharmacies, oncology clinics	Lower risk of exposure for patients and their families, workers, and others	Lower risk of adverse outcomes such as infertility, allergic reactions	Lower staff turnover; less litigation; improved safety culture; decreased workers compensation costs; improved regulatory compliance
Active surveillance, analysis and feedback of adverse events, environmental hazards and risks	Reporting “near misses”; safety walk-arounds; periodic health and safety inspections	All	Fewer hazards and adverse events in patients	Fewer injuries and illness; increased satisfaction	Increased opportunities to intervene before harm occurs; better quality data; improved compliance with regulatory and oversight bodies; improved safety culture
Ergonomics and human factors engineering, work flow redesign	Adaptive clothing and scheduled toileting for residents; mechanical lift equipment; supply kits; toilet seat risers	All	Quicker recovery; increased satisfaction; decreased errors; quicker staff response	Fewer errors; increased efficiency; fewer injuries; increased satisfaction	Higher reliability; improved adherence to guidelines; improved efficiency; decreased turnover and absenteeism, work-related illnesses
Appropriate staffing levels, mix and workload assignments	Work-hour restrictions, evidence-based shift length, rotation, rest periods	All	Lower mortality (failure to rescue); fewer fatigue-related adverse events; increased patient satisfaction	Decreased stress and burnout; enhanced morale, quality of work life	Decreased turnover; decreased absenteeism, work-related illnesses; improved publicly-reported patient satisfaction; increased market share; improved safety culture
Improving safety culture/climate and teamwork	Engaging workers and engaging patients in safety activities; leadership rounds; daily huddles	All	Fewer adverse events; increased satisfaction	Enhanced morale, employee satisfaction; decreased fatigue and burnout	Improved patient and worker outcomes; decreased litigation; improved reputation; decreased turnover

Table 1-3: Topic Areas for Interventions to Improve Safety and Examples of Potential Benefits to Patients, Staff, and Organizations (continued)

Intervention Focus	Examples of Strategies	Examples of Settings	Potential Benefits to Patients	Potential Benefits to Employees	Potential Benefits to the Health Care Organization
Safer design of practices and built environment	Improved ventilation, surfaces, water systems, private rooms, room design, and equipment proximity; healing environments	Facility-based settings	Fewer health care–associated infections; quieter; increased satisfaction; faster healing	Decreased stress; increased efficiency; fewer errors; improved security	Increased satisfaction; increased staff retention; increased patient loyalty; improved safety culture

**CASE STUDY 1-1:
BUILDING A HIGH RELIABILITY CULTURE
FOR PATIENTS AND HEALTH CARE
WORKERS, ST. VINCENT’S MEDICAL
CENTER, BRIDGEPORT, CONNECTICUT**

St. Vincent’s Medical Center is one of 75 member hospitals of Ascension Health, the largest Catholic not-for-profit health care delivery system and the third-largest overall in the United States. In 2002, Ascension Health (AH) initiated a systemwide transformational change with a goal of providing excellent clinical care with a reduction in preventable injuries or deaths by July 2008.* One hundred and twenty AH leaders met and articulated a call to action to provide “*health care that works, health care that is safe, and health care that leaves no one behind.*” To translate this vision to action, an agenda for change was created that defined strategies to achieve goals, identified challenges to the agenda, and established measurements of progress.†

Examples of environmental challenges that needed to be considered to successfully implement a transformational change process include culture, infrastructure investments, and standardization.† Two fundamental cultural issues—namely, teamwork and patient safety—became central for the system. Leadership at St. Vincent’s realized that the high reliability platform implemented for patient safety would be beneficial for employee harm reduction work, too.

Therefore, a single safety platform was adopted for all individuals in the health care organization, including patients

and health care workers (called “associates” at St. Vincent’s). In addition, St. Vincent’s is one of three AH hospitals using the approach to achieve OSHA Voluntary Protection Program (VPP) status. This case study describes the experience of making safety for all—patients and associates—part of the culture and transformation process at St. Vincent’s.

Applying the Patient Safety Platform to Associates

St. Vincent’s efforts toward developing a unified safety platform began in 2008. The medical center’s efforts were grounded in an organizational foundation that includes the following concepts:

- Just culture
- Service line organization
- Committed leadership
- National system support
- OSHA VPP work
- Quality outcome successes
- Accountability model
- Engaged board of directors

Using the patient safety platform, associate safety events were defined as follows:

- *Serious Safety Event* (SSE)—Reaches the associate and results in lost time from work
- *Precursor Safety Event*—Reaches the associate, results in minimal harm or no detectable harm with no lost time
- *Near Miss Event*—Does not reach the associate, error is caught by detection barrier designed to prevent the event

Baseline data were gathered on the number of health care associate SSEs, days between events, and major causes (failure modes).

Building Will and Leadership Involvement

For a safety program to be successful, senior leadership support and active participation is deemed essential. To build good will, a combination of approaches was used, including senior leader-led education and storytelling. The storytelling was particularly powerful, as the chief executive officer (CEO) shared stories of inadvertent harm that had occurred locally. Active support and involvement began with the board of trustees, the CEO, and senior leadership. The CEO was established as the executive sponsor. The director of Occupational Health and the director of Safety and Security became the operational leaders for the associate safety work, and the director of Quality and Patient Safety was named the operational leader for the patient safety work. Staff champions were identified and *all* staff, including physicians, were involved. The engagement of senior leadership and frontline managers was crucial in gaining staff buy-in and was a critical factor in the program's initial success.

Steps to Creating a Culture of Patient and Associate Safety

When leadership commitment was obtained, a structured process was instituted to build organizationwide awareness and support for the change process. A toolbox of high reliability behaviors based on findings from a comprehensive organizational assessment was created with the input of frontline staff. Roll-out of the toolbox was accomplished through education; all associates completed 3.5 hours of mandatory training conducted by senior leaders, inclusive of the CEO along with a key middle manager. Medical staff education commenced with a two-day retreat that focused on high reliability and safety and included actual physician-centric case studies of harm-related error. Approximately a dozen private physicians volunteered and were trained to conduct education for the remaining private medical staff. The Medical Executive Committee voted to make the high reliability safety training mandatory for eligibility for reappointment. To support actualization of high reliability behaviors, a host of operational infrastructures were implemented, such as daily in-house huddles (see Case Study Figure 1-1), unit-based huddles, meetings starting with a topic of safety (including the board meeting), senior leader rounding, safety coaches, robust root cause analysis for harm events, performance metrics that are reported via the intranet, a dashboard, and transparency in sharing stories of safety events. See Case Study Table 1-1, page 17, for descriptions of many of these activities.

Making patient and associate safety a part of the culture at St. Vincent's was facilitated by a comprehensive organizational approach that addresses policies and procedures; resource allocation (staffing, equipment, capital expenditures); organizational structures (committees, departments, lines of authority); risk and hazard assessment; adverse-event surveillance systems and analysis; and performance measure data collection, analysis, and use. Error prevention is optimized by matching safety behaviors with error prevention tools to support individual action and promote teamwork (see Case Study Figure 1-2, page 17). Important among these behaviors is rewarding successes with immediate recognition. As noted previously, feedback on performance metrics is also made available organizationwide on the intranet. Posters displaying measurement outcomes, such as the number of days without an accident, provide visual reminders of success. While high reliability behaviors were more quickly adopted for patients, a persistent focus and relentless pursuit of eliminating associate harm has become standard to core safety work.

Measuring Improvement and Realizing Benefits

Multiple metrics provide quantitative evidence of improved safety outcomes. A primary patient quality improvement metric identified in the clinical transformation at AH is the elimination of preventable injuries and deaths. Performance measurement data documents a systemwide reduction in



Case Study Figure 1-1: Daily Huddle (St. Vincent's)

Source: St. Vincent's Medical Center. Bridgeport, CT. Used with permission.

Case Study Table 1-1: Infrastructure Activities to Support High Reliability Behaviors, St. Vincent's Medical Center

Activity	Description
Daily housewide huddles	Daily briefings led by senior leadership to review safety events and concerns across the whole organization. Participation is nonnegotiable.
Unit-based huddles	Briefings to review safety events and concerns raised at the unit level. May be brought to housewide huddle by unit leadership as necessary.
Senior leader rounding	Leaders working in pairs adopt specific departments to round for patient and associate safety issues. Interactions build relationships and trust.
Safety coaches	Staff-level associates who applied and were accepted to be frontline coaches for high reliability safety work. These highly visible local-level champions monitor, train, coach and hold regular meetings to promote patient and associate safety.
Root cause analysis for harm events	A highly structured approach for conducting root cause analysis (for both patient and associate harm events), which facilitates stratification of contributing factors. Starts with focus on serious safety events and expands to precursor events and near misses as harm events decrease.
Performance metrics and dashboard	High-level metrics include SSE rate and days between harm events (both patient and associate). Detailed dashboards stratify results by unit, discipline, error type, etc.
Storytelling of safety events	The use of real-life examples to personalize important issues and events.

Source: St. Vincent's Medical Center. Bridgeport, CT. Used with permission.

Safety is the key to T.R.U.S.T.	
BEHAVIORS I commit to...	ERROR PREVENTION TOOLS:
T <u>Think twice</u>	•Use S.T.A.R. (<u>S</u> top, <u>T</u> hink, <u>A</u> ct, <u>R</u> eview)
R <u>Recognize and reward</u>	•Publicly celebrate and recognize on the spot
U <u>Utilize each other</u>	•Include patients and families •Validate and Verify (trust your instincts) •Practice peer checking and peer coaching
S <u>Speak up for safety</u>	•Use SBAR (Situation, Background, Assessment, Recommendation) •Use CUSS ("I'm <u>C</u> oncerned; I'm <u>U</u> ncomfortable; This is a <u>S</u> afety issue; We need to <u>S</u> top")
T <u>Teamwork</u>	•Practice 200% accountability (know and follow policies and advocate for compliance) •Stop and Resolve when unsure or concerned •Use direct (person-to-person) communication

Case Study Figure 1-2: Safety Is the Key to T.R.U.S.T., Error Prevention Techniques, St. Vincent's Medical Center

Source: St. Vincent's Medical Center. Bridgeport, CT. Used with permission.

preventable deaths in fiscal year 2010 that exceeds targeted goals.* Across AH hospitals, rates on other priorities (National Patient Safety Goals) are consistently better than national averages. For example, in fiscal year 2010 the AH system rate for pressure ulcers was 0.86 per 1,000 inpatient days—94% lower than the estimated national incidence of 15.44.* Performance metrics used at St. Vincent's to track improvement in associate health and safety include OSHA reportable events, the DART (days away, restricted, or transferred) rate, SSE rate, days between events, and days between needlestick injuries. Performance data shows a significant decline in all rates except needlestick injuries.

The most important return on investment has been in the reduction of harm for patients and associates. In addition, high reliability work in patient care at

Case Study Sidebar 1-1: Summary of Success Factors

The following factors helped make St. Vincent's program a success.

1. Highly visible CEO and executive staff living safety as a core value
2. Physician champions demonstrating and teaching error prevention techniques and modeling teamwork
3. Frontline staff integrated into the team through reward and information
4. Lifetime learning mindset
5. Storytelling and transparency
6. Just culture
7. Accountability infrastructure
8. Relentless focus

Source: St. Vincent's Medical Center. Bridgeport, CT. Used with permission.

AH has led to reduced malpractice costs. As sufficient associate health and safety performance outcome data over time becomes available, savings based on costs for workers' compensation, nonproductive time on the job, sick time, and so on will be calculated.

Shared Lessons

Making safety an organizationwide priority for patients and associates can be achieved when it is part of the culture and core values. A focus on error prevention and preoccupation with safety will maximize improved outcomes for everyone in the health care setting. Success demands that there can be no bystanders in this work; everyone must be an active participant. Safety at St. Vincent's is not viewed as a "program" but rather the core foundation of their work—a job that will never be completed.

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Resources 1-1: Examples of Safety Culture Surveys

Instrument Title Source and Location	Type / Domains / Dimensions / Subcontracts
Hospital Survey on Patient Safety Culture (HSOPS) http://www.ahrq.gov/qual/patientsafetyculture/hospsurindex.htm Two other surveys on patient safety culture are available from AHRQ as well: • Medical Office Survey on Patient Safety Culture http://www.ahrq.gov/qual/patientsafetyculture/mosurindex.htm • Nursing Home Survey on Patient Safety Culture http://www.ahrq.gov/qual/patientsafetyculture/nhsurindex.htm Agency for Healthcare Research and Quality (AHRQ) [Internet]. Rockville (MD): Agency for Healthcare Research and Quality; 2011 Mar [updated 2012 Jan; cited 2011 Aug 11]. Hospital Survey on Patient Safety Culture; [about 3 screens]. Available from: http://www.ahrq.gov/qual/patientsafetyculture/hospsurindex.htm. Sorra JS, Nieva VF. Rockville (MD): Agency for Healthcare Research and Quality; [updated 2004 Sep; cited 2011 Aug 11]. Hospital Survey on Patient Safety Culture, AHRQ Publication No. 04-0041 [about 74 p.]. Available from: http://www.ahrq.gov/qual/patientsafetyculture/usergd.htm.	Assesses patient safety culture. Domains include supervisor/manager expectations and actions promoting patient safety; organizational learning—continuous improvement; teamwork within hospital units; communication openness; hospital management support for patient safety; feedback and communication about error; nonpunitive response to error; staffing AHRQ toolkit of related products includes survey user's guide, feedback report template, and comparative database for optional submission

Resources 1-1: Examples of Safety Culture Surveys (continued)

Instrument Title Source and Location	Type / Domains / Dimensions / Subcontracts
Safety Attitudes Questionnaire Sexton JB, Helmreich RL, Neilands TB, Rowan K, Vella K, Boyden J, et al. The Safety Attitudes Questionnaire: psychometric properties, benchmarking data, and emerging research. BMC Health Serv Res. 2006 Apr 3;6:44. PubMed PMID: 16584553; PubMed Central PMCID: PMC1481614. Sexton JB, Thomas EJ, Helmreich RL, et al. Frontline assessments of health care culture: Safety Attitudes Questionnaire norms and psychometric properties. Austin, TX: The University of Texas Center of Excellence for Patient Safety Research and Practice, 2004. Technical Report No. 04-01. Grant No. 1PO1HS1154401. Sponsored by the Agency for Healthcare Research and Quality. Sexton JB, Thomas EJ. The Safety Climate Survey: psychometric and benchmarking properties. Austin, TX: The University of Texas Center of Excellence for Patient Safety Research and Practice, 2003. Technical Report 03-03. Grant Nos 1PO1HS1154401 and U18HS116401. Sponsored by the Agency for Healthcare Research and Quality.	Assesses patient safety culture. Measures six factors: teamwork climate, safety climate, perceptions of management, job satisfaction, working conditions, and stress recognition
Patient Safety Culture in Healthcare Organizations Survey (PSCHO) Singer S, Meterko M, Baker L, Gaba D, Falwell A, Rosen A. Workforce perceptions of hospital safety culture: Development and validation of the patient safety climate in health care organizations survey. Health Serv Res. 2007 Oct;42(5):1999–2021. PubMed PMID: 17850530; PubMed Central PMCID: PMC2254575.	Assesses nine constructs: senior management engagement; organizational resources; overall emphasis on safety; unit safety norms; unit recognition and support for safety; fear of shame; fear of blame; collective learning, provision of safe care
Modified Stanford Instrument (MSI) Patient Safety Culture Survey Ginsburg L, Gilin D, Tregunno D, Norton PG, Flemons W, Fleming M. Advancing measurement of patient safety culture. Health Serv Res. 2009 Feb;44(1):205–224. Epub 2008 Sep 17. Erratum in: Health Serv Res. 2009 Feb;44(1):321. PubMed PMID: 18823446; PubMed Central PMCID: PMC2669635.	Tool for measurement of organizational safety culture or climate
Modified Organizational Climate Description Questionnaire (OCDQ) Halpin AW, Croft DB. The Organizational Climate of Schools. International Review of Education Internationale Zeitschrift fur Erziehungswissenschaft Revue Internationale de pedagogie 22.4(1963): 441–463. Print.	Likert-type instrument assessing group and leader behaviors (four group and four leader), and determining organizational climate along six climate types arranged along a continuum of open to closed
Organizational Climate Questionnaire Litwin GH, Stringer RA. Motivation and Organizational Climate. Division of Research, Graduate School of Business Administration, Harvard University, 1968. Print.	Composed of nine climate dimensions: structure, responsibility, reward, risk, warmth, support, standards, conflict, and identity

Resources 1-1: Examples of Safety Culture Surveys (continued)

Instrument Title Source and Location	Type / Domains / Dimensions / Subcontracts
The Practice Environment Scale of the Nursing Work Index (PES-NWI) National Quality Forum (NQF) Endorsed Nursing-Sensitive Care Performance Measures. Available at: http://www.jointcommission.org/assets/1/6/NSC%20Manual.pdf or http://www.jointcommission.org/library_of_other_measures.aspx.	A survey measure of the nursing practice environment completed by staff registered nurses; includes mean scores on index subscales and a composite mean of all subscale scores
Safety and Health Leadership Quiz U.S Department of Labor, Occupational Safety and Health Administration [Internet]. Washington (DC); [cited 2011 Aug 11]. Safety and Health Leadership Quiz; [about 2 screens]. Available from: http://www.osha.gov/SLTC/etools/safetyhealth/comp1_mgt_lead_leadershipquiz.html.	Part of a larger module that includes tools on safety and health payoffs, management systems (safety and health integration), conducting a safety and health checkup, and creating change
Strategies for Leadership: An Organizational Approach to Patient Safety (SLOAPS) Voluntary Hospitals of America. Strategies for Leadership: An Organizational Approach to Patient Safety, 2000.	Assesses five common dimensions: leadership, policies and procedures, staffing, communication, and reporting. Also addresses other dimensions of patient safety climate.
Institute for Safe Medication Practices (ISMP): Medication Safety Self Assessment (MSSA) Medication Safety Self Assessment for Hospitals, 2011. Available from http://www.ismp.org/survey.	For hospital setting—assesses leadership, policies and procedures, staffing, communication, reporting, and other dimensions.
Hospital Transfusion Service Safety Culture Survey (HTSSCS) Sorra J, Nieva VF. Psychometric analysis of MERS-TM Hospital Transfusion Service Safety Culture Survey. Westat, under contract to Barents/KPMG, 2002. Contract No. 290-96-0004. Sponsored by the Agency for Healthcare Research and Quality.	Assesses communication, reporting, (and to an extent) leadership, and policies and procedures
Veterans Administration Patient Safety Culture Questionnaire (VHA PSCQ) Burr M, Sorra J, Nieva VF. Analysis of the Veterans Administration (VA) National Center for Patient Safety (NCPS) FY 2000 Patient Safety Questionnaire. Technical report. Rockville (MD): Westat; 2002. Contract No. 290-96-0004. Sponsored by the Agency for Healthcare Research and Quality.	Assesses leadership, policies and procedures, staffing, communication, and reporting
Culture of Safety Survey (CSS) Weingart SN, et al. Using a multihospital survey to examine the safety culture. <i>Jt Comm J Qual Saf</i>. 2004;30:125–132.	Measures the presence of leadership, salience, nonpunitive environment, reporting, and communication

Resources 1-2: Resources Related to Models for Demonstrating Value

Title and Website	Description
Agency for Healthcare Research and Quality (AHRQ)	
Tool Return on Investment Estimation http://www.ahrq.gov/qual/qitoolkit/f1_returnoninvestment.pdf	Provides a step-by-step method for calculating the ROI for a new set of actions implemented to improve performance on one or more of the AHRQ Quality Indicators (QIs)
Audio Teleconference Can You Minimize Health Care Costs by Improving Patient Safety? http://archive.ahrq.gov/news/ulp/costsafetele/	Web-assisted audio teleconference consists of three sessions broadcast via the World Wide Web and telephone September 20, 30, and October 1, 2002. The program explored the business case for patient safety, how to overcome barriers, and practical solutions to help states and health care facilities improve patient safety. The User Liaison Program of the AHRQ developed and sponsored the program.
Center for Health Care Strategies	
Web-Based Tool ROI Forecasting Calculator for Quality Initiatives http://www.chcsroi.org/Welcome.aspx	Web-based tool designed to help state Medicaid agencies, health plans, and other stakeholders assess and demonstrate the cost-savings potential of efforts to improve quality. It provides step-by-step instructions for users to calculate ROI for the proposed quality initiatives.
Centers for Disease Control and Prevention (CDC)	
Tutorial Cost-Effectiveness Analysis (CEA) http://www.cdc.gov/owcd/EET/costeffect2/fixed/1.html	Provides information about the use of CEA, a type of economic evaluation that examines both the costs and health outcomes of alternative intervention strategies
Institute for Healthcare Improvement (IHI)	
Tool Adverse Events Prevented Calculator http://www.ihl.org/knowledge/Pages/Tools/AdverseEventsPreventedCalculator.aspx	Users track the change in rate of any type of adverse event over time. When appropriate data are added, the user can also track the consequent change in unnecessary deaths ("lives saved"), real and additional potential cost savings, and ROI of quality improvement work targeting those adverse events.
National Institute for Occupational Safety and Health (NIOSH)	
Report Examining the Value of Integrating Occupational Health and Safety and Health Promotion Programs in the Workplace http://www.factsforhealthcare.com/management/Assets/NIOSH_Background_Paper_Goetzel.pdf	Examines the role of worker health as a key contributing factor to increases in workplace productivity and the emergence of organizational practices that support the integration of occupational health, safety, and productivity management programs
Blogpost Getting Closer to Understanding the Economic Burden of Occupational Injury and Illness http://blogs.cdc.gov/niosh-science-blog/2012/03/oshcost/	Comments on a recently published landmark paper by J. Paul Leigh (<i>Milbank Q.</i> 2011;89(6):728–772) that makes a significant contribution to understanding the economic burden of occupational illness and injury

Resources 1-2: Resources Related to Models for Demonstrating Value (continued)

Title and Website	Description
National Institute for Occupational Safety and Health (NIOSH) [continued]	
Report Pana-Cryan R, Caruso CC, and Boiano JM. Chapter 10: The Business Case for Managing Worker Safety and Health. In: US Department of Health and Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health [Internet]. State of the Sector Healthcare and Social Assistance: Identification of Research Opportunities for the Next Decade of NORA. DHHS (NIOSH) Publication Number 2009-139. Available from: http://www.cdc.gov/niosh/docs/2009-139	Discusses the current evidence and methodological challenges associated with demonstrating ROI in worker health and safety systems. It also presents several case studies on a variety of topics.
Publications	
Article Weeks WB, Bagian JP. Making the business case for patient safety. Jt Comm J Qual Saf. 2003 Jan;29(1):51–4, 1. http://www.ncbi.nlm.nih.gov/pubmed/12528574	Explains why there appears to be a business case for health care organizations to make investments to enhance patient safety
Article Hwang RW, Herndon JH. The business case for patient safety. Clin Orthop Relat Res. 2007 Apr;457:21–34. http://www.ncbi.nlm.nih.gov/pubmed/17259896	States that the business case for patient safety is a compelling one, offering substantial economic incentives for achieving the necessary goal of improved patient outcomes
Occupational Safety and Health Administration (OSHA)	
Publication Safety and Health Add Value... http://www.osha.gov/Publications/safety-health-addvalue.pdf	Informational material about how OSHA can assist companies in creating better workplaces by providing assessments and helping to implement safety and health management systems
Program OSHA's "\$afety Pays" program http://www.osha.gov/dcsp/smallbusiness/safetypays/index.html	An interactive expert system to assist employers in estimating the costs of occupational injuries and illnesses and the impact on a company's profitability. This system uses a company's profit margin, the AVERAGE costs of an injury or illness, and an indirect cost multiplier to project the amount of sales a company would need to generate in order to cover those costs. Businesses can use this information to predict the direct and indirect impact of injuries and illnesses and the estimated sales needed to compensate for these losses.

Resources 1-2: Resources Related to Models for Demonstrating Value (continued)

Title and Website	Description
Occupational Safety and Health Administration (OSHA) [continued]	
Web Links Four case study examples from health care demonstrating the business case for worker safety and health http://www.osha.gov/dcsp/products/topics/businesscase/industry.html	• “Blue Cross Blue Shield Rhode Island.” OSHA and Abbott Case Study (2005, February). Communicates the business value and competitive advantages of an effective safety and health program • “Countryside Care Nursing Home.” OSHA and Abbott Case Study (2005, February). Communicates the business value and competitive advantages of an effective safety and health program • The Business Case for Occupational Health Nurses [475 KB PDF, 4 pages]. American Association of Occupational Health Nurses (2007, May). Case studies and success stories highlighting the business benefits of hiring or partnering with occupational and environmental health nurses • Safe Lifting and Movement of Nursing Home Residents. US Department of Health and Human Services (DHHS), National Institute for Occupational Safety and Health (NIOSH) Publication No. 2006-1117 (2006, February). Presents a business case to show that the investment in lifting equipment and training for moving nursing home residents can be recovered through reduced workers’ compensation expenses and reduced costs associated with lost and restricted work days

– Chapter 2 –

Management Principles, Strategies, and Tools That Advance Patient and Worker Safety and Contribute to High Reliability

“High reliability organizations are not immune to adverse events, but they have learnt the knack of converting these occasional setbacks into enhanced resilience of the system.”—James Reason^{1(p.770)}

Providing a safety culture and ensuring leadership involvement are increasingly recognized as essential aspects of improving the quality and safety of care for patients.^{2,3} They have long been identified as key factors in establishing high reliability workplaces that strive to eliminate mistakes and prevent worker accidents.^{4,5}

Health care is now considered to be a high hazard and high risk industry for both patients and workers. Examples of hazards for patients include sentinel events such as wrong-site surgeries and surgical complications, diagnostic errors, restraint injuries, serious medication errors, transfusion errors, and healthcare-associated infections (HAIs).^{6,7} Examples of potential hazards for workers include exposures to infectious, chemical, and physical (nuclear, electromagnetic energy, noise) agents; heavy lifting and repetitive tasks; slips, trips, and falls; stress; workplace violence; and risks associated with suboptimal organization of work. These can lead to infections such as hepatitis, cancer and poor reproductive outcomes, hearing loss, musculoskeletal injuries, cardiovascular disease, acute traumatic injury, and death.

As documented in a recent National Occupational Research Agenda (NORA) report on the health care sector, there were 668,000 episodes of nonfatal occupational illness and injury in 2005, which is equivalent to one episode

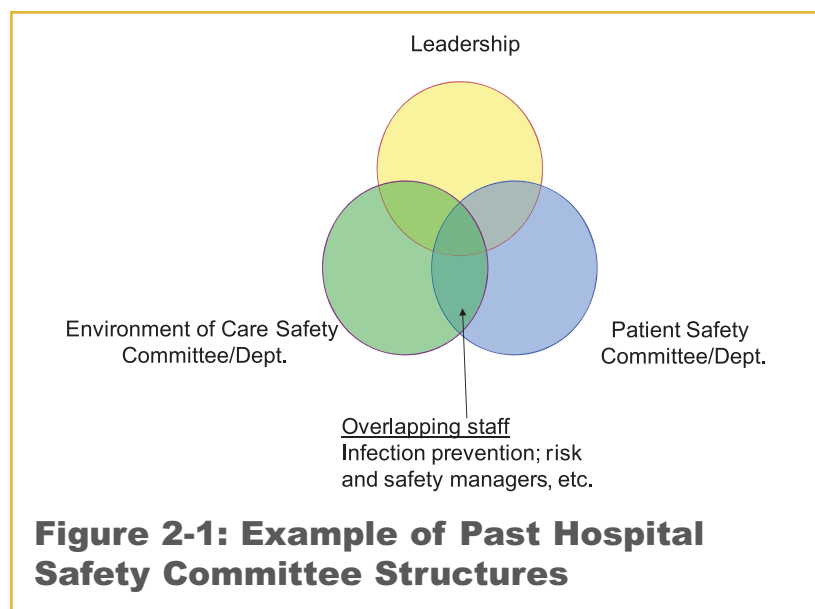
occurring every 47 seconds of that year. Compared to other industrial sectors, the health care sector had the second-largest number of such injuries and illnesses.⁸ Although worker illnesses and injuries in most work environments are decreasing, the Occupational Safety and Health Administration (OSHA) recently reported that the rate of nonfatal injury and illness requiring days away from work increased among some health care workers in 2010, according to the US Department of Labor's Bureau of Labor Statistics. The incidence rate of nonfatal occupational injuries and illnesses requiring days away from work for health care support workers increased 6% to 283 cases per 10,000 full-time workers, almost 2½ times the rate for all private and public sector workers (at 118 cases per 10,000 full-time workers). The rate among nursing aides, orderlies, and attendants rose 7%, to 489 cases per 10,000 workers. Additionally, the rate of musculoskeletal disorder cases with days away from work for nursing aides, orderlies, and attendants increased 10% to a rate of 249 cases per 10,000 workers, more than seven times the rate for all private and public sector workers (at 34 cases per 10,000 full-time workers).⁹

High-hazard, high-risk industries demand attention to safety in order to succeed. Greater awareness of worker safety and health issues coincided with the growth of organized labor in the early twentieth century. During the 1980s and 1990s, published studies drew attention to worker safety issues within the health care industry; however, many occupational risks had been known for centuries.¹⁰ By contrast, the patient safety movement developed in the late 1990s and

was exponentially accelerated by publication of the landmark Institute of Medicine (IOM) report "To Err Is Human: Building a Safer Health System" in 2000.⁶ Despite commonalities, the patient safety movement developed separately from the worker safety movement and typically involved different health care staff. In large health care organizations, responsibility for health care worker safety traditionally fell to staff in occupational safety and health, employee health, infection prevention, and environmental services. In small organizations, a single staff person often performed many of these functions. Responsibility for patient safety, on the other hand, typically was the domain of the quality management or performance improvement staff, often engaging medical staff leadership and risk management. This separation of patient and worker safety can result in "departmental silos" of staff competing for leadership attention and resources as well as fragmentation, duplication of effort, inefficiencies, and additional expense (see Figure 2-1, below).

High reliability organizations, however, have likely learned how to integrate or coordinate functions across departments and to identify and maximize synergies where possible while recognizing responsibilities that are unique to a specific purpose and stakeholders.

In this chapter, we introduce a few management and improvement concepts, principles, strategies, and tools that facilitate identification of opportunities to integrate and collaborate across departments toward the goal of improved safety for both patients and workers.



2.1 Safety Management Systems: Common Elements for Workers and Patients

In 1989 OSHA published voluntary safety management system guidelines to help organizations understand the structure and content for excellence in occupational safety and health programs.¹¹ The elements of these programs comprise a management "system" because it is "an established arrangement of components that work together to attain a certain objective, in this case to prevent injuries and illnesses in the workplace. Within a system, all parts are interconnected and affect each other"¹² (see Figure 2-2, page 27). Key activities associated with the elements are described in Table 2-1, page 28.



Figure 2-2: Four Interconnected Components of a Safety and Health Management System for Workers

Source: Occupational Safety and Health Administration [Internet]. [cited 2012 Jan 31]. US Department of Labor; [about 1 screen]. Overview of System Components. Available from: <http://www.osha.gov/SLTC/etools/safetyhealth/components.html>.

Patient safety programs and management systems closely parallel these activities. Table 2-2, page 30, presents the analogous elements for patient safety as categories (rows), then describes examples from the 2010 National Quality Forum Safe Practices for Better Healthcare as well as examples of Joint Commission standards and elements of performance that pertain to the categories.

Tables 2-1 and 2-2 highlight the common activities associated with improving safety for patients and workers in the areas of leadership responsibility, training, hazard identification, incident analysis, and improving safety culture. For more information, see the sources for the table content and other documents listed in Resources 2-1, page 41.

2.1.1 Civility in the Workplace

Closely associated with, and perhaps a necessary precursor to, improving safety culture is the need to establish a civil workplace in which staff treat each other and patients with respect. Case Study 2-1 presents an example of a broad scale effort within the Veterans Health Administration (VHA) to improve civility in the work environment.

CASE STUDY 2-1: US DEPARTMENT OF VETERANS AFFAIRS: BUILDING A CULTURE OF CIVILITY IN THE WORKPLACE—CIVILITY, RESPECT, AND ENGAGEMENT IN THE WORKPLACE

Civility, Respect, and Engagement in the Workplace (CREW) is a nationwide initiative developed by the VHA's National Center for Organization Development (NCOD) with a primary goal of changing organizational culture toward increasing civility in the workplace.* CREW was first introduced in 2005 in response to All Employee Survey results and personal interviews indicating less-than-desirable levels of civility across the organization. Top leadership endorsement for the development of the CREW initiative was obtained based on the survey data results and presentation of a business case that highlighted the impact of workplace civility on costs (for example, sick leave), safety issues, productivity, performance, and employee and patient satisfaction. Health care workers are known to experience high levels of injury and stress, and are at risk for horizontal violence and burnout (see Chapter 3, Section 3.4.1.1, page 95). In addition to the personal costs to the employee, staff burnout has serious negative effects on patient care and satisfaction.† The National Leadership Board of the VHA has endorsed civility as a core characteristic of an ideal workplace.

Defining CREW

CREW was developed at VHA's NCOD as a short-term, intensive intervention that is customized to each site and workgroup, allowing them to define culturally specific civil behaviors and select areas of focus for their particular setting. For example, a rural hospital in a small midwestern community and a large medical center in New York City may define civility differently.* Common aspects across all sites include standard training of local site leaders, educational toolkits, and use of a civility scale to survey workgroup members before and after the CREW intervention. Local site leaders facilitate honest conversations and participation within the workgroup. In addition to the use of training, practice, and toolkits, the process is enhanced through weekly support calls with a “companion” at NCOD. In addition, there are opportunities to exchange experiences between CREW facilities. Based on results of the pre-intervention survey, each workgroup typically selects focus areas, and members are encouraged to design, redesign, and test their interventions. Through their engagement, employees provide and receive feedback on the success or failure of various interventions. The civility survey is then

Table 2-1: Key Elements and Activities Associated with OSHA Components of Worker Safety and Health Management Systems

Elements of a Worker Safety and Health Management System	Activities
Leadership of the system by management	• Establish a safety and health policy • Establish goals and objectives • Provide visible top management leadership and involvement • Ensure employee involvement • Ensure assignment of responsibility • Provide adequate authority and responsibility • Ensure accountability for management, supervisors, and rank-and-file employees • Provide a program evaluation • Perform a thorough evaluation of contractors' safety record to assure they do not become a safety liability to a site. An OSHA citation history should be performed during all contract evaluations with specific safety expectations built into the contract
Employee involvement	• Participate on joint labor-management committees and other advisory groups • Conduct site inspections • Analyze routine hazards in each step of a job or process, and prepare safe work practices • Participate in developing and revising safety rules • Participate as trainers for current and new hires • Participate in accident/near miss incident investigations • Participate in decision making throughout the company's operations • Participate in pre-use and change analysis • Participate as safety observers and safety coaches • Report hazards and be involved in finding solutions to correct the problems
Analysis of worksite hazards	• Periodic, comprehensive safety, industrial hygiene, and health surveys • Analysis of accident records, near miss reporting, and employee reporting of hazards or at-risk behaviors • Routine hazard analysis, such as job hazard analysis, process hazard analysis, or phase hazard analysis • Pre-use and change analysis of the potential hazards in new or startup of facilities, equipment, materials, and processes
Prevention and control of workplace hazards	Implement the Hierarchy of Controls • Engineering controls: To the extent feasible, the work environment and the job itself should be designed to eliminate or reduce exposure to hazards based on the following principles: (1) if feasible, design the facility, equipment, or process to remove the hazard and/or substitute with something that is not hazardous or is less hazardous; (2) if removal is not feasible, enclose the hazard to prevent exposure in normal operations; and (3) where complete enclosure is not feasible, establish barriers to reduce exposure to the hazard – Enclosure of hazards – Barriers or local exhaust ventilation • Elimination of hazards through design • Administrative controls • PPE
Safety and health training	• Identify training needs • Safety training at orientation • Periodic training • Evaluate training effectiveness

Table 2-1: Key Elements and Activities Associated with OSHA Components of Worker Safety and Health Management Systems (continued)

Elements of a Worker Safety and Health Management System	Activities
Accident/incident investigation	• Training for incident investigation • Six key questions should be answered: who, what, when, where, why, and how. Fact should be distinguished from opinion, and both should be presented carefully and clearly. The report should include thorough interviews with everyone with any knowledge of the incident. A good investigation is likely to reveal several contributing factors, and it probably will recommend several preventive actions. • Information obtained through the investigation should be used to update and revise the inventory of hazards, and/or the program for hazard prevention and control
Creating a safety culture	• Obtain top management buy-in • Build trust • Conduct self assessments/benchmarking • Establish a steering committee comprised of management, employees, union (if one exists), and safety staff • Develop site safety vision, key policies, goals, measures, and strategic and operational plans • Align the organization by establishing a shared vision of safety and health goals and objectives vs. production • Define specific roles and responsibilities for safety and health at all levels of the organization • Develop a system of accountability for all levels of the organization • Develop measures and an ongoing measurement and feedback system • Develop policies for recognition, rewards, incentives, and ceremonies. Again, reward employees for doing the right things and encourage participation in the upstream activities. • Continually measure performance, communicate results, and celebrate successes • Ongoing support—reinforcement, feedback, reassessment, midcourse corrections, and ongoing training is vital to sustaining continuous improvement

Adapted from source: Occupational Safety and Health Administration [Internet]. [cited 2012 Jan 31]. US Department of Labor; [about 1 screen]. Safety and Health Program Management: Fact Sheets. Available from: http://www.osha.gov/SLTC/etools/safetyhealth/mod4_factsheets.html.

repeated after the intervention to measure change. CREW was initially piloted at eight sites in 2005, and has now expanded to include more than 1,000 workgroups, encompassing all clinical and administrative disciplines.

Measuring Improvement and Workplace Impact

In a study to conduct a preliminary evaluation of CREW, Osatuke et al.* found that sites that had implemented CREW showed significant improvement in post-intervention civility ratings, as opposed to comparison sites that did not. Specifically, data collected for more than five years has demonstrated that higher civility is associated with fewer sick leave hours and fewer equal employment opportunity (EEO) complaints. CREW has also been found to be an

effective tool in addressing horizontal violence and employee/supervisor conflict as well as positively affecting the quality of interactions with patients and families. Some cost savings have been approximated. For example, an average work unit with high civility may have reduced annual EEO complaint costs of up to \$61,000 per year and reduced costs of approximately \$250 per employee in use of annual sick leave. Improved retention, productivity, and quality outcomes also suggest possible savings. Furthermore, lower mortality rates and decreased lengths of stay have been documented in intensive care units with higher civility. CREW success has led to expansion over the past few years, with the initiative being extended to other VA and non-government entities in the United States and Canada.

Table 2-2: Examples of Recommended Practices and Expectations Within Patient Safety Programs Parallel to Those in Safety and Health Management Systems for Workers

Elements of Patient Safety Program Recommendations and Requirements	Recommended Activities from National Quality Forum “Safe Practices for Better Healthcare”	Examples of Joint Commission Standards and Elements of Performance for Hospitals
Leadership of the system by management	Safe Practice 1: Leadership Structures and Systems Leadership structures and systems must be established to ensure that there is organizationwide awareness of patient safety performance gaps, direct accountability of leaders for those gaps, and adequate investment in performance improvement abilities, and that actions are taken to ensure safe care of every patient served. Safe Practice 9: Nursing Workforce Implement critical components of a well-designed nursing workforce that mutually reinforce patient safeguards, including the following: • A nurse staffing plan with evidence that it is adequately resourced and actively managed and that its effectiveness is regularly evaluated with respect to patient safety • Senior administrative nursing leaders, such as a Chief Nursing Officer, as part of the hospital senior management team • Governance boards and senior administrative leaders that take accountability for reducing patient safety risks related to nurse staffing decisions and the provision of financial resources for nursing services • Provision of budgetary resources to support nursing staff in the ongoing acquisition and maintenance of professional knowledge and skills Safe Practice 10: Direct Caregivers Ensure that nonnursing direct care staffing levels are adequate, that the staff are competent, and that they have had adequate orientation, training, and education to perform their assigned direct care duties.	Standard LD.04.04.05 The hospital has an organizationwide, integrated patient safety program within its performance improvement activities. LD.04.04.05, EP 1 The leaders implement a hospitalwide patient safety program. LD.04.04.05, EP 3 The scope of the safety program includes the full range of safety issues, from potential or no-harm errors (sometimes referred to as near misses, close calls, or good catches) to hazardous conditions and sentinel events. LD.03.06.01, EP 3 Leaders provide for a sufficient number and mix of individuals to support safe, quality care, treatment, and services. LD.04.04.05, EP 13 At least once a year, the leaders provide governance with written reports on the following: • All system or process failures • The number and type of sentinel events • Whether the patients and the families were informed of the event • All actions taken to improve safety, both proactively and in response to actual occurrences • For hospitals that use Joint Commission accreditation for deemed status purposes: The determined number of distinct improvement projects to be conducted annually • All results of the analyses related to the adequacy of staffing

Table 2-2: Examples of Recommended Practices and Expectations Within Patient Safety Programs Parallel to Those in Safety and Health Management Systems for Workers (continued)

Elements of Patient Safety Program Recommendations and Requirements	Recommended Activities from National Quality Forum “Safe Practices for Better Healthcare”	Examples of Joint Commission Standards and Elements of Performance for Hospitals
Employee involvement	Safe Practice 3: Teamwork Training and Skill Building Health care organizations must establish a proactive, systematic, organizationwide approach to developing team-based care through teamwork training, skill building, and team-led performance improvement interventions that reduce preventable harm to patients.	LD.03.01.01, EP 3 Leaders provide opportunities for all individuals who work in the hospital to participate in safety and quality initiatives. EC.03.01.01, EP 3 Staff and licensed independent practitioners can describe or demonstrate how to report environment of care risks.
Analysis of hazards	Safe Practice 4: Identification and Mitigation of Risks and Hazards Health care organizations must systematically identify and mitigate patient safety risks and hazards with an integrated approach in order to continuously drive down preventable patient harm.	EC.02.01.01, EP 1 The hospital identifies safety and security risks associated with the environment of care that could affect patients, staff, and other people coming to the hospital's facilities. Note: <i>Risks are identified from internal sources such as ongoing monitoring of the environment, results of root cause analyses, results of annual proactive risk assessments of high-risk processes, and from credible external sources such as Sentinel Event Alerts.</i> EC.02.02.01, EP 1 The hospital maintains a written, current inventory of hazardous materials and waste that it uses, stores, or generates. The only materials that need to be included on the inventory are those whose handling, use, and storage are addressed by law and regulation. EC.04.01.01 The hospital collects information to monitor conditions in the environment.
Prevention and control of hazards	Safe Practice 19: Hand Hygiene Comply with current Centers for Disease Control and Prevention (CDC) Hand Hygiene Guidelines. Safe Practice 20: Influenza Prevention Comply with current CDC recommendations for influenza vaccinations for health care personnel and the annual recommendations of the CDC Advisory Committee on Immunization Practices for individual influenza prevention and control.	EC.02.01.01, EP 3 The hospital takes action to minimize or eliminate identified safety and security risks in the physical environment. LD.04.04.03, EP 1 The hospital's design of new or modified services or processes incorporates the needs of patients, staff, and others. LD.04.04.05, EP 10 At least every 18 months, the hospital selects one high-risk process and conducts a proactive risk assessment. IC.02.01.01, EP 1 The hospital implements its

Continued on next page

Table 2-2: Examples of Recommended Practices and Expectations Within Patient Safety Programs Parallel to Those in Safety and Health Management Systems for Workers (continued)

Elements of Patient Safety Program Recommendations and Requirements	Recommended Activities from National Quality Forum “Safe Practices for Better Healthcare”	Examples of Joint Commission Standards and Elements of Performance for Hospitals
Prevention and control of hazards (continued)		infection prevention and control activities, including surveillance, to minimize, reduce, or eliminate the risk of infection. IC.02.01.01, EP 2 The hospital uses standard precautions,* including the use of personal protective equipment, to reduce the risk of infection. * For further information regarding standard precautions, refer to the Website of the Centers for Disease Control and Prevention (CDC) at http://www.cdc.gov/hai/ (Infection Control in Healthcare Settings). IC.02.03.01 The hospital works to prevent the transmission of infectious disease among patients, licensed independent practitioners, and staff. IC.02.04.01 The hospital offers vaccination against influenza to licensed independent practitioners and staff. NPSG.07.01.01 Comply with either the current CDC hand hygiene guidelines or the current World Health Organization (WHO) hand hygiene guidelines.
Safety training	Safe Practice 3: Teamwork Training and Skill Building Health care organizations must establish a proactive, systematic organizationwide approach to developing team-based care through teamwork training, skill building, and team-led performance improvement interventions that reduce preventable harm to patients.	EC.03.01.01, EP 1 Staff and licensed independent practitioners can describe or demonstrate methods for eliminating and minimizing physical risks in the environment of care. LD.03.01.01, EP 6 Leaders provide education that focuses on safety and quality for all individuals. HR.01.05.03 Staff participate in ongoing education and training
Accident/incident investigation	Safe Practice 4: Identification and Mitigation of Risks and Hazards—Additional Specifications Integrated Organizationwide Risk Assessment: The continuous, systematic integration of the information about risks and hazards across the organization should be undertaken to optimally prevent systems failures. Information about risks and hazards from multiple sources should be evaluated in an	LD.04.04.05, EP 6 The leaders provide and encourage the use of systems for blame-free internal reporting of a system or process failure, or the results of a proactive risk assessment. LD.04.04.05, EP 8 The hospital conducts thorough and credible root cause analyses in response to sentinel events.

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Table 2-2: Examples of Recommended Practices and Expectations Within Patient Safety Programs Parallel to Those in Safety and Health Management Systems for Workers (continued)

Elements of Patient Safety Program Recommendations and Requirements	Recommended Activities from National Quality Forum “Safe Practices for Better Healthcare”	Examples of Joint Commission Standards and Elements of Performance for Hospitals
Accident/incident investigation (continued)	integrated way in order to identify patterns, systems failures, and contributing factors involving discrete service lines and units. The organization should integrate the information noted below, ensure that it is provided to those designing mitigation strategies and that it is documented and disseminated widely across the organization systematically and frequently, and ensure that the results of mitigation activities are made available to all who were involved in providing source information.	LD.04.04.05, EP 11 To improve safety and to reduce the risk of medical errors, the hospital analyzes and uses information about system or process failures and the results of proactive risk assessments.
Creating a safety culture	Safe Practice 2: Culture Measurement, Feedback, and Intervention Health care organizations must measure their culture, provide feedback to the leadership and staff, and undertake interventions that will reduce patient safety risk. Safe Practice 8: Care of the Caregiver Following serious unintentional harm due to systems failures and/or errors that resulted from human performance failures, the involved caregivers (clinical providers, staff, and administrators) should receive timely and systematic care to include: treatment that is just, respect, compassion, supportive medical care, and the opportunity to fully participate in event investigation and risk identification and mitigation activities that will prevent future events.	LD.03.01.01 Leaders create and maintain a culture of safety throughout the hospital. LD.03.01.01, EP 1 Leaders regularly evaluate the culture of safety and quality using valid and reliable tools. LD.03.01.01, EP 4 Leaders develop a code of conduct that defines acceptable behavior and behaviors that undermine a culture of safety. LD.03.01.01, EP 5 Leaders create and implement a process for managing behaviors that undermine a culture of safety. LD.03.01.01, EP 7 Leaders establish a team approach among all staff at all levels. LD.03.01.01, EP 8 All individuals who work in the hospital, including staff and licensed independent practitioners, are able to openly discuss issues of safety and quality. LD.04.04.05, EP 9 The leaders make support systems available for staff who have been involved in an adverse or sentinel event. Note: Support systems recognize that conscientious health care workers who are involved in sentinel events are themselves victims of the event and require support. Support systems provide staff with additional help and support as well as additional resources through the human resources function or an employee assistance program. Support systems also focus on the process rather than blaming the involved individuals.

Valuable Lessons

The improved cross-disciplinary communication (respectful, clear, assertive) is seen to have a direct impact on the safety of the work environment for staff and patients. Lessons from six years of CREW implementation include the following:

- Participation by individual employees should not be deemed mandatory, although behaving according to CREW principles should be.
- CREW is workgroup based; it builds on relationships at the workgroup level.
- It requires consistent, visible leadership support on all levels.
- It is enhanced by full support and participation of labor unions.
- It perpetuates by “viral spread.”
- Anecdotally, employees in CREW groups report stronger trust, teamwork, resolution of problems/conflicts when they occur, clearer understanding of connections to other initiatives (for example, diversity, ethics, patient-centered care, systems redesign, customer service, and learning organization) and an increased awareness of their personal contribution to the mission of the organization.
- CREW is most successful when it is not thought of as simply another program or initiative but the way business is to be done.

Case Study References

- * Osatuke K, Moore SC, Ward C, Dyrenforth SR, Belton L. Civility, respect, engagement in the workforce (CREW): Nationwide

Organization Development Intervention at Veterans Health Administration. *J Appl Behav Sci.* 2009 Sep 1;45(3):384–409.

- † Garman AN, Corrigan PW, Morris S. Staff burnout and patient satisfaction: evidence of relationships at the care unit level. *J Occup Health Psychol.* 2002 Jul;7(3):235–241. PubMed PMID: 12148955.

2.2 Hierarchy of Controls: Example of a Framework for Interventions to Prevent Harm

Controlling exposures to occupational hazards is a fundamental method of protecting workers. After workplace hazards have been identified, the obvious subsequent step is to mitigate them. Industrial hygienists have created a very helpful framework for developing interventions and deciding which prevention methods to implement. This framework is known as the hierarchy of controls.¹³ It lists, in decreasing order of efficacy, the general control methods that should be applied to resolve hazardous situations. In many cases, a combination of control methods will be applied, but the expectation is that each control type will be considered in a sequential fashion and in a descending order. All reasonable attempts should be made to use the more-effective steps higher in the hierarchy before lower steps are considered. A lower step should not be chosen until practical applications of the preceding higher levels are exhausted.¹³

Although the hierarchy of controls varies slightly among different countries and different organizations, it generally follows the structure described in Table 2-3.

Table 2-3: Hierarchy of Controls

Control Type	Description
Elimination	A control that removes the hazard from the work process
Substitution	A control in which a less hazardous or nonhazardous substance or process is used in place of the original hazard
Engineering	Controls that isolate the hazard from the worker
Administrative or Work Practices	Practices and policies employed by an organization to limit an employee's exposure to a hazard.
Personal Protective Equipment	Special equipment designed to prevent workers from coming into contact (via inhalation, ingestion, or absorption) with a hazardous substance.

Adapted from source: Milz SA. Principles of evaluating worker exposure. In: *The Occupational Environment: Its Evaluation, Control and Management*. Falls Church (VA): American Industrial Hygiene Association, 2011.

Table 2-4: Examples of Controls in Worker and Patient Safety

Control	Worker Safety Examples	Patient Safety Examples	Examples for Both Workers and Patients
Elimination	Immunization against Hepatitis B	Designing tubing connections so they cannot fit other ports	Removal of latex-based products to prevent sensitization and allergic reactions
Substitution	Digital imaging instead of wet chemicals; microfiber mops instead of conventional mops	Substituting bottles of concentrated potassium chloride on nursing units with premeasured unit dose vials	Slip-resistant floors; changing from germicide spray solutions to wipes to reduce aerosolized respiratory irritants
Engineering controls	Ventilated cabinets for compounding of chemotherapy drugs in pharmacy, safety engineered sharp devices, blunt suture needles, patient lifting equipment; MRI control rooms	Bar-coded patient identification bands for medication administration systems; “smart pumps” for intravenous infusions; RFID sponge counters technology	Isolation rooms with negative pressure ventilation to reduce transmission of airborne pathogens; separated decontamination units
Administrative and organizational controls	Staffing levels, staff rotation, standard or contact precautions, training	Checklists for central line insertions; time-out prior to surgery; competency testing, daily huddles; pharmacy rounds	Customize staffing mix and level based on patient/resident acuity or needs; monitor hand hygiene
Personal Protective Equipment and individual-level behaviors, responses	Gloves, goggles, respirators, masks, hand hygiene; Hepatitis B and related immunizations	Hand hygiene, gowns, gloves, masks, immunization	Influenza immunization; tuberculosis infection testing

There is no direct association between the level of control and the cost of the intervention. Costs vary depending on the variables under consideration. For example, designing a mistake-proof system to prevent exposure to a hazardous chemical or radiation may require a large upfront investment, and the long-term savings to workers and patients may make the innovation highly cost effective. The National Institute for Occupational Safety and Health (NIOSH) recommends that elimination and substitution be addressed during the design and development phases of a project, because it is often more difficult and expensive to apply these controls to existing processes and systems. While administrative controls and personal protective equipment (PPE) or behavior change may have lower upfront costs, the effort and resources required to maintain these controls over the long run can become quite expensive.

Though the hierarchy of controls principle was initially developed and applied to worker safety issues, it is applicable to patient safety as well. Table 2-4 provides examples of controls applied at each level for worker and patient safety. In practice, preventing hazards and accidents for both workers and patients often requires a combination of controls applied at all levels.

2.3 Human Factors and Safer Design

“Trying harder will not work. Changing systems will.” So says the IOM in *Crossing the Quality Chasm: A New Health System for the 21st Century*.¹⁴

The scientific fields of human factors, ergonomics, and safer engineering of work processes and the built environment all contribute potential solutions to improving safety for patients and workers. The sections that follow provide a

brief introduction to the topic areas and resources for further information.

2.3.1 Human Factors

Human factors science is a broad discipline that studies the relationship between human behavior, system design, and safety.¹⁵ The World Health Organization (WHO) describes human factors as inclusive of environmental, organizational, and job factors in combination with the human and individual characteristics that influence behavior at work in a way that can affect health and safety. It is broken down into three aspects—the job, the individual, and the organization—and how they impact people’s health and safety-related behavior.¹⁶ Another definition of *human factors* is “the application of scientific knowledge about human strengths and limitations to the design of systems in the work environment to ensure safe and satisfying performance.”¹⁷

Outside of health care, human factors research and engineering has a prominent role in high risk industries such as aerospace and nuclear power. For example, the Federal Aviation Administration has invested heavily in human factors research and development regarding flight deck activities and air traffic control operations.¹⁸ An aviation-based intervention to improve safety by enhancing teamwork called “Crew Resource Management” has also been successfully applied in health care.^{19,20}

Adopting a systems perspective is a key element of the National Research Council’s Board on Human-Systems Integration. This board serves to provide new perspectives on theoretical and methodological issues concerning the relationship of individuals and organizations to technology and the environment; identifies critical issues in the design, testing, evaluation, and use of new human-centered technologies; and advises sponsors on the research needed to expand the scientific and technical bases for designing technology to support the needs of its users.²¹ Information from a report on human factors issues in home health care is described in the next resource table.

Those who study root causes of errors in health care find that human factors often contribute to adverse events for patients. Many of these same factors also contribute to adverse events for workers. Figure 2-3, page 37, provides an overview of the many factors that contribute to adverse events. The factors lie along a continuum, from latent conditions, which often lie dormant and hidden in the organi-

zation, to active errors committed by health care providers during the care process. A complete explanation of the factors at each tier is found in the Agency for Healthcare Research and Quality (AHRQ) publication titled *Patient Safety and Quality: An Evidence-Based Handbook for Nurses*.¹⁷

2.3.2 Ergonomics

Ergonomics is the science of fitting workplace conditions and job demands to the capabilities of the working population.²² According to OSHA, a good fit between employee capabilities, workplace conditions, and job demands helps ensure high productivity, avoid illness and injury, and increase satisfaction in the workforce. This, in turn, should translate to higher quality patient care and fewer adverse events for workers and patients.

Much of the ergonomic work in health care has been focused on preventing or alleviating musculoskeletal disorders (MSDs). Common examples of ergonomic risk factors are found in jobs requiring repetitive, forceful, or prolonged exertions of the hands; frequent or heavy lifting, pushing, pulling, or carrying of heavy objects; and prolonged awkward postures. Vibration and cold may add risk to these work conditions. Jobs or working conditions presenting multiple risk factors will have a higher probability of causing a musculoskeletal problem. The level of risk depends on the intensity, frequency, and duration of the exposure to these conditions and the individual’s capacity to meet the force of other job demands that might be involved.²² See Chapter 3 for additional information on ergonomic health care interventions to reduce MSDs.

Strategies to better fit workplace conditions and job demands to worker capabilities fall into the following three categories related to the hierarchy of controls; examples for each category are shown in Sidebar 2-1, page 38:

- 1) Administration/management/leadership
- 2) Equipment/engineering/environmental
- 3) Health care worker/patient/other individuals

The importance of human factors and ergonomics in improving safety continues to grow. A recent article suggests that the patient safety field has failed to recognize the need to include human factors and ergonomics in solutions and interventions. It recommends expanded training for clinicians as well as increased pressure on manufacturers to incorporate human factors and ergonomic principles and techniques.²³

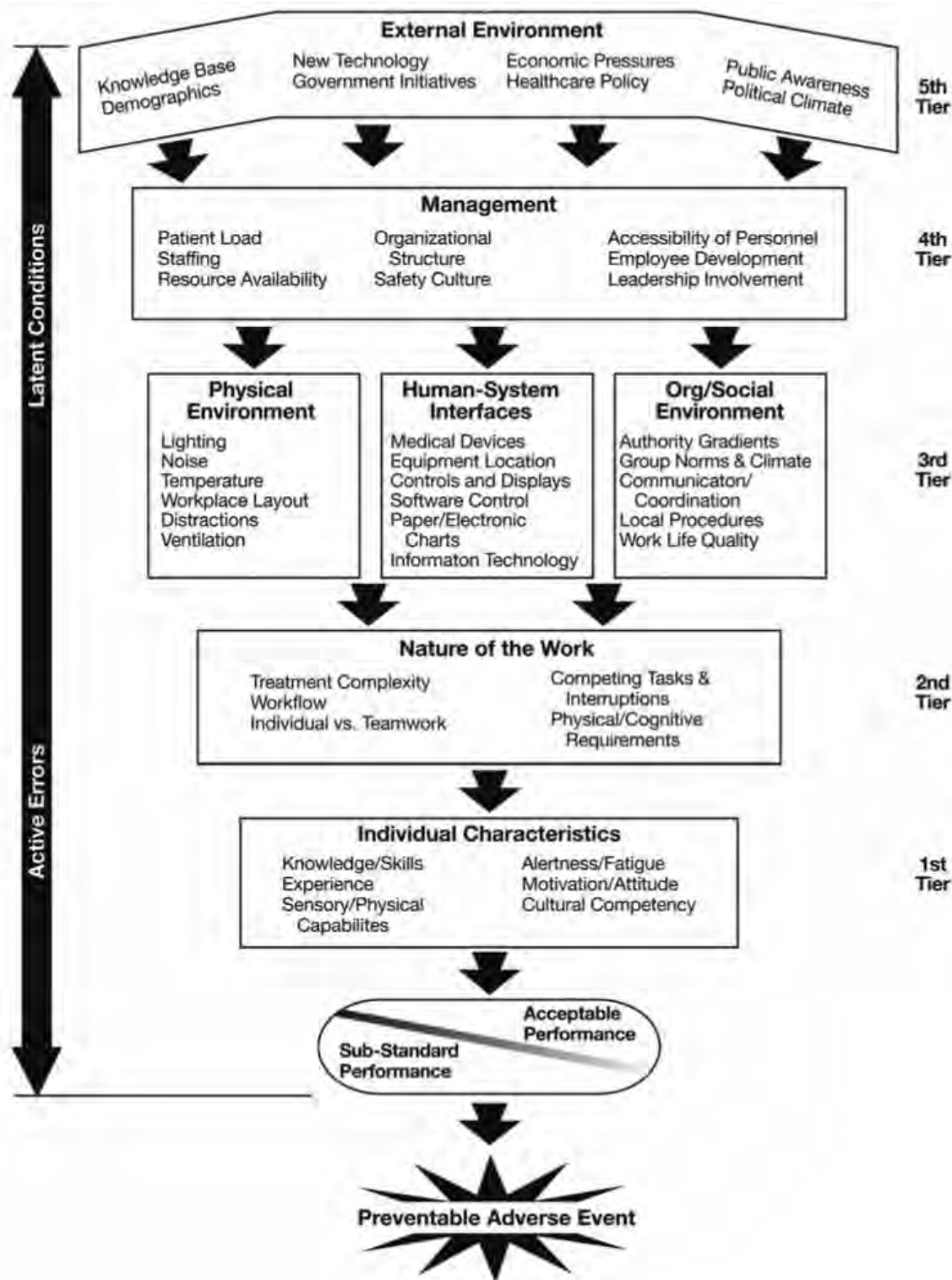


Figure 2-3: Contributing Factors to Adverse Events in Health Care

Source: Henriksen K, et al. Understanding adverse events: A human factors framework. In Hughes RG, editor. Patient Safety and Quality: An Evidence-Based Handbook for Nurses. Rockville (MD): Agency for Healthcare Research and Quality (US), 2008 Apr. Chapter 5. Available from: <http://www.ncbi.nlm.nih.gov/books/NBK2666/>.

Sidebar 2-1: Examples of Strategies to Better Fit Workplace Conditions and Job Demands to Worker Capabilities

Strategies to better fit workplace conditions and job demands to employee capabilities fall into three categories. This sidebar shows examples of what can be done to ensure patient/worker safety for each category.

- 1) Administration/management/leadership
 - Demonstrate a commitment to reduce or eliminate patients/residents handling hazards through establishing a written program
 - Provide continued training of employees in injury prevention and use of assistive devices
 - Clarify methods of transfer and lifting to be used by all staff and importance of proper technique
 - Monitor compliance with transfer and lift procedures
 - Establish and educate staff on procedures for reporting unsafe working conditions and early signs and symptoms of back pain and other musculoskeletal injuries
 - Provide for adequate staffing, assessment of patient's/resident's needs, and restricted admittance policies
 - Conduct a workplace analysis using observations, surveys, and staff interviews to identify hazards
- 2) Equipment/engineering/environmental
 - To prevent MSDs and falls, provide assistive devices or equipment such as mechanical lift equipment, sliding boards, repositioning devices, shower chairs, walking belts, and the like
 - To prevent infections and improve hand hygiene adherence to guidelines, conveniently locate sinks and alcohol-based hand rubs at room entrances
 - To prevent sharps injuries, use safety-engineered sharp devices
- 3) Health care worker/patient/other individuals
 - Report unsafe working conditions to management
 - Promptly report MSD signs and symptoms as well as injuries to occupational health
 - Follow procedures for lifting and use of equipment

Adapted from source: Occupational Safety and Health Administration [Internet]. [cited 2012 Jan 31]. US Department of Labor; [about 10 screens]. Healthcare Wide Hazards: Ergonomics. Available from: <http://www.osha.gov/SLTC/etools/hospital/hazards/ergo/ergo.html>.

2.3.3 Safer Design of Work Processes

The goal of redesign (or reengineering) of work processes for safety is to make it harder to do the wrong thing and easier to do the right thing. Redesign has been shown to be more effective in decreasing errors than other interventions such as education, incentives, and threats.^{24,25} Simplification and standardization of processes across different areas are key elements in redesign. The probability that a process will fail is directly related to the number of steps and lack of consistency in the process across providers.²⁵ Simplification and standardization are particularly important for processes that are high risk for patients and/or for workers. Examples of standardization include central line–insertion supply kits or carts, use of metered dispensers of premixed cleaning chemicals, and use of standard precautions to prevent transmission of infections.

An organization's first step in safer process design is mapping its current processes to identify opportunities for improvement. The Institute for Healthcare Improvement (IHI) offers free tools and instructions for this activity.²⁶ It is important also to observe the actual implementation of the process at various points in time to determine where and how errors occur. Redesign considerations can also address the interface between products and users; the choice of processes, materials, and equipment; work organization and policies; and the physical environment. Figure 2-4, page 39 shows an example of a flowchart algorithm for safe patient transfer.

The scale of redesign can be small or large. In some cases, redesigns can eliminate the errors entirely; in others, redesign can reduce the frequency or mitigate the impact of errors.²⁷ For example, during the 1990s, there were many deaths associated with accidental administration of concentrated potassium chloride.²⁸ A process redesign that required removal of concentrated potassium chloride from a unit's floor stock led to substantial reduction in this sentinel event.²⁹ A simple process redesign example to prevent sharps injuries is hands-free transfer of surgical instruments using a tray.

A free toolkit and case example of redesign at the health care system level applied by Denver Health is available from AHRQ.³⁰

2.3.4 Preventing Harm Through Safer Design of the Built Environment

Understanding the effect of architectural and engineering design, construction, and maintenance (both exterior and

Algorithm 1: Transfer To and From: Bed to Chair, Chair to Toilet, Chair to Chair, or Car to Chair
Last rev. 10/01/2008

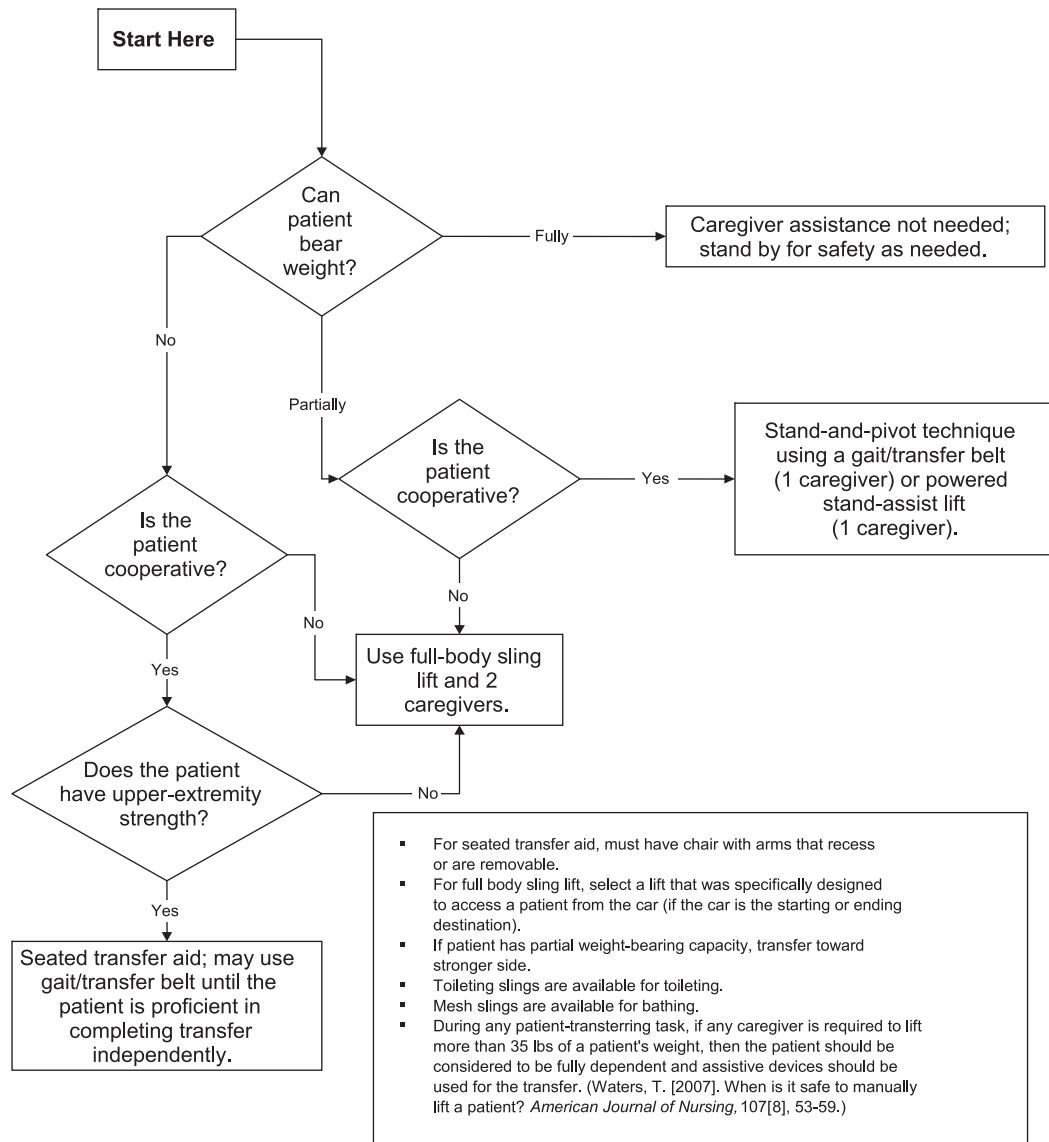


Figure 2-4: Sample Flow Chart

Source: US Department of Veteran Affairs [Internet]. Algorithms for Safe Patient Handling and Movement. Available from: VISN 8 Partner Safety Center of Inquiry. Tampa, FL. VA Sunshine Healthcare Network, Safe Patient Handling and Movement. <http://www.visn8.va.gov/visn8/patientsafetycenter/safePtHandling/default.asp>.

interior) on safety practices is an emerging scientific field with much promise. As shown in the hierarchy of controls, the most effective way of hazard mitigation is via elimination. This is best accomplished during the design process. NIOSH is leading a national initiative called “Prevention through Design” (PtD) to promote “addressing occupational

safety and health needs in the design process to prevent or minimize the work-related hazards and risks associated with the construction, manufacture, use, maintenance, and disposal of facilities, materials, and equipment” and highlight the importance to worker safety of preventing or minimizing these hazards and risks.³¹

Another prominent organization involved with safer design is Health Care Without Harm (HCWH), an international coalition of hospitals and health care systems, medical professionals, community groups, health-affected constituencies, labor unions, occupational and environmental health organizations, and religious groups. Adhering to the oath of “first do no harm,” partnering organizations are working to implement ecologically sound and healthy alternatives to health care practices that pollute the environment and contribute to disease.³² Together with the Center for Maximum Potential Building Systems, HCWH has released the *Green Guide for Health Care*, which is a toolkit providing quantifiable and sustainable design, construction, and operations techniques customized for the health care sector. Using these techniques will help health care organizations build facilities that are more healthful for people, workers, patients, and visitors alike—and better for the environment.³³

Recently, more than 500 leading hospitals committed to a new campaign known as the Healthier Hospitals Initiative. This three-year campaign will focus on the following tasks:

- Engaging in leadership on environmental health and sustainability
- Serving more healthful foods and beverages
- Reducing energy use
- Reducing waste and increasing recycling
- Using safer chemicals
- Purchasing environmentally preferable products³⁴

On the patient safety side, two organizations have been at the forefront of addressing safety through design. The Center for Health Design (CHD) was formed in 1993 with a mission to transform health care environments for a healthier, safer world through design research, education, and advocacy.³⁵ The Robert Wood Johnson Foundation has supported the development of evidence that demonstrates that safer design is effective. For example, a paper by Ulrich and Barach describes potential uses of design to prevent harm related to areas such as noise, medication and data entry errors, healthcare-associated infections, falls, and intrafacility handoffs and transfers.³⁶

AHRQ and the Facilities Guidelines Institute convened a national seminar in October 2011 to address the role of the built environment in improving patient safety.³⁷ Among the recommendations that emerged was the need to develop an explicit vision for patient safety in the predesign phase and to conduct risk assessments for patient safety and infection control. A risk-assessment tool is under development by a subgroup of meeting participants.

The built environment includes not only inpatient facilities like hospitals and nursing homes but also the environments for nonfacility-based health care services such as home health care. A recent report published by the National Academies of Sciences and AHRQ entitled “Health Care Comes Home: The Human Factors” describes the impact of technology, environment, policy, and human factors on the growing field of home health care. It includes information on what devices and tools are available, the impact of health information technology, and the ways different cultures approach home health care. It also offers recommendations to ensure quality health care in the home.³⁸

2.4 Improving Performance Through Incident Reporting and Feedback Systems

The past several decades have witnessed a surge in paradigms, strategies, and tools to improve performance in health care. Various models of quality improvement have been applied in health care settings, including the well-known cycle of “plan-do-study-act,” or “PDSA.”^{39,40} More recently, The Joint Commission has proposed the model of Robust Process Improvement (RPI).⁴¹ RPI combines concepts from the industrial models of Lean and Six Sigma (which includes the phases of define, measure, analyze, improve, and control known as “DMAIC”) with change management methodologies and tools for helping organizations achieve high reliability.⁴² Structured process improvement models such as these provide a systematic approach to solving complex problems and help guide improvement teams to examine why processes fail to achieve their desired results.

Regardless of the method selected and tools used for quality improvement, opportunities to coordinate patient and worker safety improvement should be identified and explored for data that support combined patient/worker health and safety issues. Take, for example, the case of a hospital that has a quality improvement initiative to report and analyze patient falls. This initiative includes reporting of “near-miss” falls in which the patient did not actually get hurt. A root cause analysis of these events might reveal that workers are getting injured instead because of their efforts to prevent patients from falling. A multidisciplinary team may be able to identify solutions that prevent injury to patients and workers simultaneously. This example also highlights the value of having frontline staff participate directly in the design and planning stages of safety reporting systems and improvement activities.

Resources 2-1: Human Factors and Safer Design

Title and Website	Description
Agency for Healthcare Research and Quality (AHRQ)	
Publication Mistake-Proofing the Design of Health Care Processes; AHRQ Publication No. 07-0020, May 2007 http://www.ahrq.gov/qual/mistakeproof/mistakeproofing.pdf	This volume represents a compendium of information and ideas to broaden the reader's understanding of mistake proofing and its emerging role in health care and patient safety.
DVD Transforming Hospitals: Designing for Safety and Quality; AHRQ Publication No. 07-0076-DVD, September 2007 http://www.ahrq.gov/qual/transform.htm	This DVD examines the case for evidence-based hospital design and how it strengthens patient and staff satisfaction and safety, quality of care, and employee retention, and results in a positive return on investment.
Handbook Henriksen K, Dayton E, Keyes MA, Carayon P, Hughes R. Chapter 5: Understanding Adverse Events: A Human Factors Framework (http://www.ncbi.nlm.nih.gov/books/n/nursehb/ch5/) Stone PW, Hughes R, Dailey M. Chapter 21: Creating a Safe and High-Quality Health Care Environment (http://www.ncbi.nlm.nih.gov/books/NBK2634/) Reiling J, Hughes RG, Murphy MR. Chapter 28: The Impact of Facility Design on Patient Safety (http://www.ncbi.nlm.nih.gov/books/NBK2633/) Hughes RG, editor. Patient Safety and Quality: An Evidence-Based Handbook for Nurses [Internet]. Rockville (MD): Agency for Healthcare Research and Quality (US); [updated 2008 Apr; cited 2012 Jan 30]. Available from: http://www.ahrq.gov/qual/nurseshdbk/	This free online publication presents a wealth of information about improving safety and the work environment, not only for nurses but for all who work in health care settings.
American Industrial Hygiene Association® (AIHA®)	
Website AIHA reference document to employers and employees regarding ergonomics. http://www.aiha.org/news-pubs/govtaffairs/Documents/Ergonomics%20Reference%20Document-11-10-11.pdf	This site directs you to an ergonomics reference document. AIHA® adopted its first position statement on the issue of ergonomics in 1997. AIHA has amended this position statement on several occasions, most recently in October 2009. AIHA believes information should be made available to assist employers and employees in developing guidelines or otherwise addressing ergonomics concerns.
Centers for Disease Control (CDC) – National Institute for Occupational Safety and Health (NIOSH)	
Website Prevention through Design http://www.cdc.gov/niosh/topics/ptd/	A NIOSH-led national initiative called Prevention through Design (PtD) to promote a concept to “design out” or minimize hazards and risks early in the design process. It highlights its importance in all business decisions.

Resources 2-1: Human Factors and Safer Design (continued)

Title and Website	Description
Centers for Disease Control (CDC) – National Institute for Occupational Safety and Health (NIOSH) [continued]	
Publication A Primer Based on Workplace Evaluations of Musculoskeletal Disorders http://www.cdc.gov/niosh/docs/97-117/	This publication describes the basic elements of a workplace program aimed at preventing work-related musculoskeletal disorders (WMSDs). It includes includes a “toolbox,” which is a collection of techniques, methods, reference materials, and sources for other information that can help in program development.
Publication The Changing Organization of Work and the Safety and Health of Working People http://www.cdc.gov/niosh/docs/2002-116/	This publication discusses sweeping changes in the organization of work that have been influenced by major economic, technological, legal, political, and other forces.
Publication Fisher JM. Rapporteur’s Report: Healthcare and Social Assistance Sector. Journal of Safety Research. 2008 Mar 14;39(2):179–181. Available from: http://www.cdc.gov/niosh/topics/ptd/pdfs/Fisher.pdf.	This paper describes key implementation issues and specific needs, challenges, and opportunities from the Prevention through Design (PtD) initiative in the following areas: practice, research, policy, and education.
Report Quinn M, Pentecost R III, Fisher J, and Hughes N. Chapter 8: Healthy Healthcare Design. In: US Department of Health and Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health [Internet]. State of the Sector Healthcare and Social Assistance: Identification of Research Opportunities for the Next Decade of NORA. DHHS (NIOSH) Publication Number 2009-139. Available from: http://www.cdc.gov/niosh/docs/2009-139.	This chapter reviews the literature and state of the science related to design and ergonomic issues in health care.
Center for Health Design	
Conference Paper Cohen G. “First do no harm,” Designing the 21st Century Hospital: Environmental leadership for healthier patients and facilities. Center for Health Design, RWJF, 2006. http://www.healthdesign.org/chd/research/first-do-no-harm	This paper was presented by The Center for Health Design (CHD) and Health Care Without Harm (HCWH) at a conference sponsored by the Robert Wood Johnson Foundation, September 2006. The paper explores the implications of this new science linking contaminants and health and discusses the environmental innovations that hospitals are implementing to not only create more optimal conditions for healing in their institutions but also to prevent disease in the general public.
Report Designing for Patient Safety: Developing Methods to Integrate Patient Safety Concerns in the Design Process Anjali Joseph, PhD, EDAC (Principal Investigator) http://www.healthdesign.org/sites/default/files/chd416_ahrqreport_final.pdf	This is the final report of an AHRQ-supported project initiated for the following: to develop consensus around important patient safety issues to be considered during various stages in the healthcare design process and to identify key activities, methodologies, and tools for improving facility design in terms of patient safety.

Resources 2-1: Human Factors and Safer Design (continued)

Title and Website	Description
Facility Guidelines Institute Publication Guidelines for Design and Construction of Health Care Facilities http://www.fgiguideelines.org	The Guidelines for Design and Construction of Health Care Facilities recommends minimum program, space, functional program, patient handling, infection prevention, architectural detail, and surface and furnishing needs for clinical and support areas of hospitals, ambulatory care facilities, rehabilitation facilities, and nursing and other residential care facilities.
Institute for Healthcare Improvement (IHI) School for Health Professionals IHI Open School Exercise on Identifying Human Factors in Health Care http://www.ihl.org/offerings/ihlopenschool/resources/Pages/Tools/ExerciseHumanFactors.aspx	An exercise that allows the participant to analyze everyday situations to determine what human factors issues are at play and decide what interventions should be introduced to minimize the opportunities for mistakes.
Joint Commission Resources Workshop Safe Health Design Learning Academy http://www.jcrinc.com/SHD-Pilot-Program/	This site links the reader to an experiential workshop for clinical leaders impacting health care construction. The goal of the initiative is to provide the information, resources, and support needed by clinical leaders/decision makers to create evidence-based health care facilities that will support people and processes, now and into the future.
National Research Council Report Brief Health Care Comes Home: The Human Factors. Washington (DC): The National Academies Press; 2011. http://www7.nationalacademies.org/dbasse/Report_Brief_Health_Care_Comes_Home_The_Human_Factors.pdf	As described in the report brief, the safety, quality, and effectiveness of home health care can be informed by many issues encompassed by the field of human factors research and practice—which studies human capabilities and limitations and their interaction with the design of products, processes, systems, and work environments. For that reason, the AHRQ asked the Board on Human-Systems Integration of the National Research Council to conduct a systematic investigation of the role of human factors in home health care. In response, the multidisciplinary Committee on the Role of Human Factors in Home Health Care was formed to examine a diverse range of behavioral and human factors issues resulting from the increasing migration of medical devices, technologies, and care practices into the home. Its goal was to lay the groundwork for a thorough integration of human factors, knowledge, and research with the design and implementation of home health care devices, systems, technologies, and practices.

Resources 2-1: Human Factors and Safer Design (continued)

Title and Website	Description
Publications	
Carroll JS, Rudolph JW. Design of high reliability organizations in health care. <i>Qual Saf Health Care</i> . 2006;15(Suppl 1):i4–i9.	These articles provide information about environmental design and safety.
Reiling JG, Knutzen BL, Wallen TK, McCullough S, Miller R, Chernos S. Enhancing the traditional hospital design process: A focus on patient safety. <i>Jt Comm J Qual Saf</i> . 2004 Mar;30(3):115-124. Erratum in: <i>Jt Comm J Qual Saf</i> . 2004 May;30(5):233. PubMed PMID: 15032068.	
Ulrich R, Zimring C, Quan X, Joseph A, Choudhary R. <i>The Role of the Physical Environment in the Hospital of the 21st Century: A Once-in-a-Lifetime Opportunity</i> . Princeton (NJ): Robert Wood Johnson Foundation; 2004.	
The Joint Commission	
White Paper Health Care at the Crossroads: Guiding Principles for the Development of the Hospital of the Future http://www.jointcommission.org/assets/1/18/Hospital_Future.pdf	This white paper addresses broad issues relating to the provision of safe, high-quality health care and, indeed, the health of the American people. The white paper represents the culmination of a round-table discussion. Proposed principles for guiding future hospital development are summarized.
Washington State Department of Labor and Industries and Puget Sound Human Factors and Ergonomics Society	
Examples of Costs and Benefits of Ergonomics http://www.pshfes.org/Resources/Documents/Ergonomics_cost_benefit_case_study_collection.pdf	An annotated bibliography of case studies and reports describing sources, interventions, costs, measurements, and savings on ergonomic interventions across industries. Includes more than 40 studies related to health care ergonomics.

Chapter 3 provides examples of topic areas in which improvement activities will directly benefit patients and workers. Identifying high-priority health and safety issues that impact workers and patients at an organization can be supported by looking across existing performance measurement and data collection systems. Continued measurement is critical to evaluating the impact (and hopefully improvement) of a quality initiative. It may be possible to work with information technology staff to interrelate patient safety and employee safety and health data reporting and analysis systems. Linkages could be used to monitor the impact of interventions targeted toward either patients or workers on outcomes for both groups to identify benefits as well as unintended negative consequences. This can help build a baseline of evidence for assessing the combined impact of

safety problems as well as the dual benefit of improvements. Finally, financial data sources (patient and employee) may provide information about baseline costs, both direct and indirect, and changes over time in response to improvement interventions.

2.4.1. Sources for Outcome Data on Worker and Patient Safety

Data on occupational injury and illness are collected and reported under OSHA regulations, which require that organizations use the Log of Work-Related Injuries and Illnesses (Form 300) to list acute injuries and illnesses and track days away from work, restricted work activity, or job transfer (also known as Days Away, Restrictions and Transfers, or DART).⁴³ Other available forms from OSHA

include the Injury and Illness Report (Form 301) to record supplementary information about recordable cases and the Summary (Form 300A) to show totals for the year in each category. Tracking rates and trends such as DART provides important outcome data on employee safety and health. In addition to occupational health, other sources for worker data within an organization may include the departments of employee health, human resources, infection prevention, risk management, and quality improvement.

Examples of existing sources within health care organizations for patient safety outcome data include morbidity and mortality conferences, risk management and sentinel event reports, and performance measure data required for external reporting to government and private organizations.

2.4.2 Incident Surveillance, Reporting, Analysis, and Feedback

Another example of parallel worker and patient safety-related activities is incident identification and management. Incident reporting systems were originally developed in industries in which safety was critical, such as the airline and nuclear power industries. The underlying concept of incident reporting systems is that reporting and investigation of individual events, and “near misses” or “close calls” can generate useful information to identify opportunities for improvement in local systems and processes.⁴⁴

The application of incident reporting systems to patient safety grew rapidly after publication of the IOM report “To Err Is Human: Building a Safer Health System.”⁴⁶ Aggregating and reporting incidents to external organizations that maintain a centralized database can lead to identification of new hazards, trends, and potential strategies for solutions; these solutions can then be shared broadly to prevent incidents from occurring elsewhere. This is the concept behind the Patient Safety and Quality Improvement Act of 2005 (Patient Safety Act) that led to the development of Patient Safety Organizations (PSOs).⁴⁵ These organizations are public or private entities that create a secure environment in which clinicians and health care organizations can collect, aggregate, and analyze data, thereby improving quality by identifying and reducing the risks and hazards associated with patient care.⁴⁶

Effective incident reporting and feedback systems have many steps in common. As described by Benn and colleagues,⁴⁴ there are nine stages within the safety feedback loop that contribute to the system success (see Figure 2-5, page 46).

In its “Draft Guidelines for Adverse Event Reporting and Learning Systems,” WHO identified the following four core principles underlying its guidelines⁴⁷:

- The fundamental role of (patient) safety reporting systems is to enhance (patient) safety by learning from failures of the health care system.
- Reporting must be safe. Individuals who report incidents must not be punished or suffer other ill effects from reporting.
- Reporting is only of value if it leads to a constructive response. At a minimum, this entails feedback of findings from data analysis. Ideally, it also includes recommendations for changes in processes and systems of health care.
- Meaningful analysis, learning, and dissemination of lessons learned require expertise and other human and financial resources. The agency that receives reports must be capable of disseminating information, making recommendations for changes, and informing the development of solutions.

Clearly, the value of incident/event reporting systems derives from going beyond reporting to include analyzing, investigating, identifying and implementing solutions, and monitoring the effectiveness of those solutions.

Despite the long history of incident reporting systems, the ability to reap the full benefit of such systems remains elusive. Experience in the field with both worker and patient safety reporting systems has identified significant challenges at each step.^{48–50} For example, some employers establish safety programs that unintentionally reward their employees for not reporting errors or injuries, such as bonuses or parties when an injury-free period is completed.⁵¹ Although these employers may be able to boast of days without a reported error or injury, their patients or employees may actually be injured. Negative peer pressure or the desire to “win” or be a “team player” may cause the employees to underreport errors or injuries.

With substantial effort and effective strategies to overcome legal (such as variation in tort laws), practical (such as time constraints), and attitudinal barriers (such as fear of blame), organizations have been able to increase reporting of incidents. For example in 2003, England and Wales established a National Reporting and Learning System for collecting and analyzing data on patient safety incidents. Reporting has steadily increased over time, and researchers have found that hospitals with more positive data on stan-

Individual stages of the safety-feedback loop for prevention of adverse events through ongoing detection and analysis of incidents and near misses experienced by the organisation

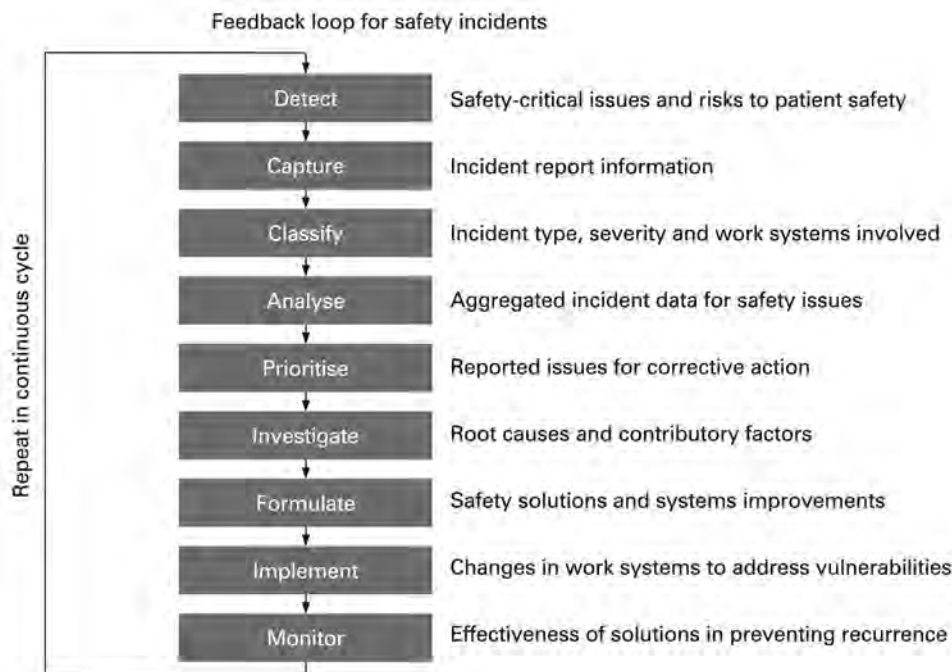


Figure 2-5: Feedback Loop for Safety Incidents

Source: Benn J, Koutantji M, Wallace L, Spurgeon P, Rejman M, Healey A, Vincent C. Feedback from incident reporting: Information and action to improve patient safety. *Qual Saf Health Care*. 2009 Feb;18(1):11–21. Review. PubMed PMID: 19204126. Used with permission.

standardized safety culture surveys were more likely to report events. Moreover, these events included a lower proportion of slips, trips, and falls. This suggests that reporting of more events is associated with safer hospitals instead of the converse.⁵² Nevertheless, analysis, feedback, and implementation of effective solutions often remain an enormous challenge in health care organizations, for both patient and worker safety systems.

2.4.2.1 Examples of Injury and Illness Tracking Systems for Workers and Patients

Following are examples of national surveillance and performance measurement systems, either electronic and/or manual that can be used to track health care–associated injuries, illnesses, hazards, and exposures and gain comparative information.

- **CDC National Healthcare Safety Network (NHSN)**
The NHSN is a secure, Internet-based surveillance system that expands and integrates former CDC surveillance systems, including the National Nosocomial Infections Surveillance (NNIS) System, National

Surveillance System for Healthcare Workers (NaSH), and the Dialysis Surveillance Network (DSN).⁵³

NHSN enables health care facilities to collect and use data about health care–associated infections, adherence to clinical practices known to prevent health care–associated infections, the incidence or prevalence of multidrug-resistant organisms within their organizations, trends and coverage of health care personnel safety and vaccination, and adverse events related to the transfusion of blood and blood products.

The NHSN comprises the following four components: patient safety, health care personnel safety, research and development, and biovigilance. The majority of acute care hospitals are now required to submit data to the NHSN patient safety module to comply with states and Centers for Medicare & Medicaid Services quality reporting initiatives.⁵⁴

- **NHSN Healthcare Personnel Safety Component**
In the 1990s the CDC developed the NaSH, which

focused on surveillance of exposures and infections among health care personnel. Operational from 1995 through 2007, NaSH has been replaced by the Healthcare Personnel Safety Component of the NHSN. The component consists of the following four modules: (1) Blood/Body Fluids Exposure with Exposure Management, (2) Blood/Body Fluids Exposure only, (3) Influenza Exposure Management, and (4) Influenza Vaccination Summary Module.⁵⁵

- **NHSN Patient Safety Component**

Instructions and standardized surveillance methods and definitions are fundamental to the specific types of surveillance within the Patient Safety Component outlined below:

- Device-associated module:
 - CLABSI - Central line–associated bloodstream infection
 - CLIP - Central line–insertion practices adherence
 - VAP - Ventilator-associated pneumonia
 - CAUTI - Catheter-associated urinary tract infection
 - DE - Dialysis Event
- Procedure-associated module:
 - SSI - Surgical-site infection
 - PPP - Postprocedure pneumonia
- Medication-associated module:
 - AUR - Antimicrobial use and resistance options
- Multidrug-resistant Organism/*Clostridium difficile* Infection (MDRO/CDI) module
- Vaccination module

- **NIOSH Surveillance Systems**

NIOSH funds and conducts research on surveillance methods and conducts surveillance activities to fill gaps in existing surveillance data and define future research priorities. For example, NIOSH has a system of surveillance for some occupational respiratory diseases, and it analyzes national health surveys to detect patterns and trends of respiratory disease within occupations and industries. NIOSH maintains the Work-Related Injury Statistics Query System (Work-RISQS) for national information on nonfatal occupational injuries associated with visits to hospital emergency rooms. For more information on these NIOSH activities visit <http://www.cdc.gov/niosh/programs/surv/>⁵⁸

NIOSH plans to implement a new surveillance system to monitor occupational injuries to health care workers, called the Occupational Health and Safety Network (OHSN). The aim of the OHSN is to identify effective prevention strategies and help health care facilities implement them in their own practices—these injuries can range from slips, trips, and falls; workplace violence; and physical overexertion. The benefits of this program will include (but is definitely not limited to) the following:

- Benchmarking rates and trends against data from similar facilities
- Comparing patterns of injuries and circumstances leading to those injuries
- Identifying effective intervention approaches shared by NIOSH and other OHSN participating facilities

Open enrollment for OHSN is planned to begin around end of 2012 to the beginning of 2013.⁵⁶

- **National Database of Nursing Quality Indicators (NDNQI)**

Some professional organizations have comparative performance measurement systems that include data for both workers and patients. For example, the American Nurses Association NDNQI provides its participating members with individual and comparative performance data on topics such as:

- Patient falls and falls with injury
- Pressure ulcers (hospital acquired and unit acquired)
- Physical/sexual assault
- Staff mix (registered nurses [RNs] licensed practical/vocational nurses [LPN/LVNs], unlicensed assistive personnel [UAP])
- Nursing care hours provided per patient day
- Nurse turnover
- RN education/certification
- RN practice environment and job satisfaction⁵⁷

2.5 Selected Strategies and Tools for Improving Safety

Following are some selected strategies and tools for improving safety in health care organizations.

2.5.1 Leadership Strategies

Successful improvement initiatives require leadership support; successful transformation of organizational culture requires total leadership engagement. Study after study shows leadership commitment to be the strongest dimension

of culture/climate, particularly commitment that is demonstrated through deeds rather than words.⁵⁹⁻⁶¹ As noted in Chapter 1, there is increasing consensus that meeting the safety challenges facing health care will require a transformation in organizations and that leaders from all stakeholders carry the responsibility of making it happen.⁶² Leadership responsibilities and the need for transforming existing management structures have been examined by an array of public and private entities working to promote enhanced safety and quality of care. For example, the IHI's white paper *Leadership Guide to Patient Safety*⁶³ describes the role of leadership "to establish the value system in the organization; set strategic goals for activities to be undertaken; align efforts within the organization to achieve those goals; provide resources for the creation, spread, and sustainability of effective systems; remove obstacles to improvements for clinicians and staff; and require adherence to known practices that will promote patient safety."⁶³ Adopting the principles used in high reliability organizations described in Chapter 1 is thought to hold great promise for improving health care safety and quality.^{64,41} Leadership across all levels in health care, from providers to evaluators, has a critical role to play in promoting safety. Leaders drive organizational values, which in turn drive behaviors that then drive performance.⁶² What strategies and tools will assist a leader to achieve success? Here are a few suggestions.

2.5.1.1 Tell Real Stories

Storytelling involves sharing real-life examples of safety incidents to demonstrate important health and/or safety concerns, risks, or outcomes impacting patients and health care workers. Raising the awareness of all levels of leadership from the board to frontline managers regarding the risks, events, and opportunities for improvement in employee and patient safety is imperative. In Chapter 1, storytelling was used as a powerful tool by St. Vincent's to build will (gain support) within the organization. (See Chapter 1, Case Study, "Building a High Reliability Culture for Patients and Health Care Workers, St. Vincent's Medical Center, Bridgeport, Connecticut," page 15.) Leaders and employees can use this tool to increase awareness across the organization and to promote an understanding of the safety risks common to patients and workers.

2.5.1.2 Conduct Leadership Rounds

Leadership rounds engage senior organizational leadership in making "rounds" to interact with frontline staff and patients. For example, the IHI has a tool called Patient Safety Leadership WalkRounds™ that enhances leadership

recognition and understanding of issues that affect direct care staff.⁶³ This can be a vehicle to communicate organizational values and vision. When leaders go to the units and "round" across shifts, staff do not have to leave the patient care area to attend meetings. Identification of safety risks, implementation of policies, and performance of procedures can be discussed right where people work. In addition, this method makes leaders visible and accessible, two techniques used by successful managers. Communication should be open and nonjudgmental. An example of applying this practice in the home care setting is described in Case Study 2-2.

CASE STUDY 2-2: DUKE HOME CARE: FOCUSING ON SAFETY IN HOME CARE—THE DIRECTOR SAFETY ROUNDS PROGRAM

At Duke University Health Systems (DUHS), establishing and maintaining a culture of safety is a primary strategic initiative across all system entities. In 2004 DUHS established the Office of Patient Safety with a mission to educate leadership and staff on implementing new systemwide safety standards and communication processes*. A comprehensive education and training program in safety culture was developed and provided to all organizational leaders, managers, supervisors, and staff. Safety leaders were named in each DUHS entity, and a process was created for senior leaders to interface with frontline staff for the purpose of sharing information and ideas about patient safety. Based on work by Allan Frankel, MD, the director of patient safety for Partners HealthCare System in Boston, this informal exchange of information informs leaders of staff concerns relating to patient safety and promotes staff awareness of leadership's commitment to patient and staff safety.* In the hospital setting this resulted in the creation of "Patient Safety Leadership WalkRounds™". Senior leadership at Duke HomeCare & Hospice (DHCH) made a commitment to the WalkRounds™ concept and in 2006 implemented Director Safety Rounds modeled after the inpatient process.

Structuring a Safety Rounds Program for the Nonacute Care Setting

The objective of the DHCH safety rounds is to strengthen the safety culture across all programs and departments by

improving communication and teamwork at all levels of the organization. The senior leadership team is composed of the executive director, medical director, and all program/department directors. Examples of other participating directors include the directors of hospice, home health, infusion, accreditation and compliance, human resources, information technology, finance, and development.*

To become familiar with the safety rounds concept, DHCH leaders observed the WalkRounds™ at DUHS and then began a process of adapting/adopting rounds for the nonacute care environment. The most significant difference involved identifying the programs and entities to be visited and operationalizing rounds outside the hospital setting. Programs and locations selected for rounds beyond home care and hospice home patients (adult and pediatric) are hospice skilled nursing and assisted living facilities, DHCH pharmacy, DHCH distribution center (supply storage and preparation for home delivery), and office-based support staff (for example, information technology, referral and administrative staff, finance, human resources, and so on).*

Key elements of the method developed for safety rounds are as follows:

- Rounds are conducted throughout the year.
- All selected programs and locations are visited.
- Seven senior leaders each conduct a monthly safety round in a selected program/location for three consecutive months.
- Leaders use a script of questions to open dialogue with staff (five questions) and patients/families (four questions) and to focus on identified themes (see Case Study Table 2-1, page 50)
- Leaders respond to issues raised during rounds within four weeks and provide feedback directly to staff.
- Safety rounds activities are reported and reviewed at several levels including an all-agency staff meeting (quarterly), the agency's Quality and Safety Core committee (monthly), and the DUHS board of directors.

Spreading the Word and Improving Safety

Communication is the cornerstone of a successful safety rounds program. For several months prior to initiation it was featured in "THE LINK," an internal agency newsletter, followed by a formal introduction at an all-staff meeting. The importance of open and honest discussions is stressed and confidentiality is assured. Additional input is obtained in monthly departmental meetings that are opened

Case Study Sidebar 2-1: Medication Reconciliation (Duke Home Health)

Safety check protects Duke Home Health patient from harm associated with inadvertent overdose.

As part of the admission process, a physical therapist conducting a medication reconciliation in accordance with the Duke Home Health medication reconciliation policy discovered a discrepancy between the prescribed dose of an anticoagulant medication and the dosage on a box of prefilled syringes in the home. After reviewing the doctor's discharge instructions and speaking with the patient, the therapist realized that the patient had been taking more than twice the prescribed amount for the previous five days. Further investigation revealed that the pharmacy providing the medication had attached written directions to the bag to take only the prescribed amount but no further instructions on how to administer the proper dosage. The patient had overlooked the handwritten note and taken what he assumed was the correct dosage. As a result of identifying the miscommunication, a new pharmacy safety procedure was put in place to verbally alert each patient when a dose requires adjustment in administration. By carefully administering the medication reconciliation procedure, the therapist was able to correct the patient's dosage before he experienced any adverse effects from the medication.

by soliciting safety suggestions and concerns from staff. At each quarterly all-staff meeting, a "safety story" is shared that demonstrates how team members, patients, and/or caregivers worked together to improve safety. A safety story shared at a recent staff meeting described a medication administration error discovered during a patient admission procedure (see Case Study Sidebar 2-1, above).

The Safety Rounds Program has resulted in an increased awareness of what safety issues concern staff most. For example, reported concerns for personal and environmental safety led to the development of a special proactive risk-assessment team to address issues faced by agency staff conducting home visits. A multiphase intervention began with a staff survey inquiring what safety risks staff perceive. Survey results were combined with staff interview data to identify and prioritize safety risks, and to design improvement strategies, which included a personal safety training program. Another tool used to reinforce safety messages is the key card. These laminated cards are carried on a ring and pro-

Case Study Table 2-1: Duke HomeCare & Hospice: Focusing on Safety in Home Care— Safety Rounds Questions

The Director: Safety Rounds Program

Program/Area: _____

Date of Safety Round: _____

Participants: _____

Introduce the Safety Rounds Team and Staff Member:

Purpose: Share information and learn about real or potential safety concerns. Assure staff that this is not a test or an evaluation; encourage them to speak freely and openly without fear of retaliation.

Questions to be asked of each staff member during each safety round:

1. Tell me about the concerns you have related to patient safety. How about your personal safety? Are there any other safety concerns?
2. What is the next thing that could harm this patient in particular, or any of our patients?
3. What specific intervention from leadership would make the work you do safer for patients?
4. Are there any processes, policies, or Joint Commission National Patient Safety Goals that are not clear to you?
5. What aspects of the environment are likely to lead to the next patient harm?

Questions to be asked of patients/caregivers during each safety round:

1. Do you have any safety concerns or questions about your care?
2. Do you know what to do in an emergency and how to contact us?
3. Do you have any suggestions to help us improve your safety or the safety of others?
4. If the patient is using oxygen determine:
 - If patient has been educated on oxygen safety in the home
 - If smoke alarms are present and in working order
 - If there is a fire escape plan for the patient

Source: Mullin L. Keeping safety a priority in home care and hospice. One agency's journey. Home Healthcare Nurse. 2010;28(2);63–70. Used with permission.

vide important reminders (for example, hand hygiene, how to report a sharps injury, infection surveillance), telephone numbers (emergency contact), nursing protocols (nursing bag technique, how to access policies and procedures electronically), and clinical aides (pain scales, look alike/sound alike medications).

Five Years and Going Strong

The Safety Rounds Program has been used successfully at DHCH for more than five years. Benefits have included enhanced communication across all levels of the agency and a commitment to safety as an organizational priority. Staff completing the annual Work Culture Survey gives high marks to leadership for their support of the safety culture. Also, it is significant to note that there have been no acts of violence or other safety events involving staff in recent years. Designing and implementing leadership safety rounds required identifying strategies to overcome challenges posed by diverse geographic service areas, multiple programs and locations, and a mobile work force. As part of the DUHS strategic safety initiative, this program has successfully established a proactive approach to recognizing potential safety risks and intervening before an error or injury harms a patient or home care staff.

Source

- * Mullin L. Keeping safety a priority in home care and hospice: One agency's journey. Home Healthcare Nurse. 2010 Feb;28(2):63–70. PubMed PMID: 20147799.

2.5.2 Management Strategies to Support Staff Engagement in Improving Patient and Worker Safety

Achieving improved safety for patients and workers begins with organizational culture but is executed in job performance. Every employee from support staff (housekeeping) to direct care staff (nurses, therapists, physicians) has some aspect of job performance that potentially affects their own and patient safety. By providing positive feedback, employers can further safety. When adverse events occur, or even near misses, strategies to support staff recovery should be employed to hasten staff return to maximum professional function. Finally, employees at all levels are uniquely positioned to identify opportunities for improvement and participate in development and implementation of solutions. As described by Berwick,⁶⁵ improvements in quality and safety occur most effectively

when management entrusts and empowers staff to improve processes; in turn, staff trust that management supports their well-being and genuine desire to improve.

2.5.2.1 Provide Training, Time, and Resources

Though leadership ultimately determines resources, it is managers who determine staff time and requirements for training as well as implement the training. Managers directly influence staff perception of the organization's culture related to safety, learning, staff growth and development, and teamwork. It is the manager's responsibility to operationalize the organization's core values and provide training and growth opportunities. The manager also needs to allow sufficient time and resources for staff engagement in safety improvement teams and initiatives.

2.5.2.2 Recognize or Reward All Efforts

Providing incentives and recognition for efforts to achieve safety improvements are powerful tools that can reinforce activities integrating patient and worker safety. Some rewards will be inherent in the improved outcomes for patients and workers. For example, interventions taken within an organization to reduce the incidence of violence have an inherent reward of making workers and other patients feel safer and valued. In the case study on reducing violence included in Chapter 3 ("Reducing assaults against patients and staff in a behavioral health unit," page 104), the units were rewarded for maintaining defined periods without a reported incident, thereby actively engaging both staff and patients in the process. Frontline managers are important facilitators in providing direct recognition, while the organization can celebrate unit- and system-level safety improvements for both patients and workers. Some organizations may provide financial incentives based on the achievement of performance goals as part of compensation packages.

2.5.2.3 Utilize Frontline Safety Coaches, Champions, and Unit Peer Leaders

In the Veterans Health Administration (VHA), they are known as unit peer leaders; in other organizations they may be called coaches or champions. Regardless of the titles assigned, employees can be supported in keeping a focus on safety by fellow frontline employees who have volunteered to serve as safety leaders. These colleagues reinforce the organization's safety culture as well as gather valuable first-hand feedback on issues. They are a visible reminder of the organization's commitment to worker and patient safety who can provide on-site training and champion safety initiatives.

2.5.2.4 Analyze Feedback and Findings from Patient and Worker Satisfaction Surveys to Identify Opportunities for Improvement

It is critical to assess employee perception of organizational values and safety climate in order to achieve system goals. Employee satisfaction can reflect the health of the workplace environment, which in turn affects employee well-being and patient care. Patients and families should also be encouraged to actively participate in efforts to improve safety, when possible, through the use of educational tools. Measuring patient satisfaction and soliciting feedback also provides a source of information on their perceptions of the quality of care. For example, it has been found that lower patient satisfaction scores may be present with higher incidence of staff burnout.⁶⁶ Most health care organizations have established methods for assessing patient and staff satisfaction. Surveys may be conducted by external companies using standardized tools or internally with customized instruments. These surveys can provide a valuable source for identifying quality improvement opportunities.

2.5.3 Tools to Enhance Communication

Communication is a critical factor in safety; the lack of communication is often noted as a contributing factor in adverse events. For example, communication failure was identified as one of the top contributing root causes in sentinel events reported to The Joint Commission from 2004 through third quarter 2011.⁶⁷ Faulty communication is widespread in the health care setting, and it presents risks for the safety of caregivers and patients alike.⁶⁸ Conversely, open communication that promotes discovery of safety risks by not hiding potential and actual system failures is a hallmark of high reliability organizations. Multiple communication strategies have been developed across other high risk industries, such as space shuttle mission control, nuclear power, and railroad dispatching. These provide a rich source of tools for research and adaptation in the health care setting. A few communication techniques are briefly described here.

2.5.3.1 Daily Huddles

Daily huddles are briefings to review concerns, safety events, near misses, and any safety-related issues that have occurred across the entire organization during the previous 24 hours. Leadership huddles are attended by all members and all levels of leadership to review events that have been identified organizationwide (see Case Study 1-1, page 15). Unit-based huddles are briefings to review safety events and concerns raised at the unit level that

consequently may be elevated to leadership or shared at the organizational briefing as appropriate. Frontline staff and managers should participate.

2.5.3.2 Phrase to Signal Concern and Demand Attention

One example of a communication technique to empower staff to speak up when they see a potential safety issue is the use of the acronym CUS—Concerned, Uncomfortable, and Safety issue. As further described in the Pathways for Patient Safety™ document (listed in Resources 2-2, pages 57–60), CUS is shorthand for a three-step process that assists people in stopping the activity when they sense or discover a safety breach. To be most effective, all members of the team should be familiar with this technique and understand the implications when a fellow team member says:

- I am **C**oncerned.
- I am **U**ncomfortable.
- This is a **S**afety issue.

2.5.3.3 Teach Back or Repeat Back

Teach back is usually used in health care worker-patient communication. The patient is asked to repeat back or “teach back” the information provided to confirm accurate understanding of material. However, health care workers are encouraged to practice teach back or repeat back with their colleagues as well as their patients.⁶⁹ These are considered “closed loop” communication strategies (see Resources 2-2, the Canadian Patient Safety Institute section).

2.5.3.4 Situation-Background-Assessment-

Recommendation (SBAR) Communication and SHARE

SBAR provides a standardized format for communication by applying a framework for organizing information. It is an easy-to-use format for structuring any communication among health care workers, but it is especially relevant when exchanging clinical data between clinicians. The elements include the following:

- S** = Situation (a concise statement of the problem)
- B** = Background (pertinent and brief information related to the situation)
- A** = Assessment (analysis and considerations of options—what you found/think)
- R** = Recommendation (action requested/recommended—what you want)⁷⁰

When trained in the use of SBAR, staff can standardize information transfer and minimize incomplete or unclear communications. A toolkit and additional information on this technique can be found at the IHI website.⁷⁰

Recently, The Joint Commission Center for Transforming Healthcare released a tool for enhancing communication during hand-offs. The acronym SHARE stands for the following:

- **Standardize critical content**, which includes providing details of the patient’s history to the receiver, emphasizing key information about the patient when speaking with the receiver, and synthesizing patient information from separate sources before passing it on to the receiver.
- **Hardwire within your system**, which includes developing standardized forms, tools, and methods, such as checklists, identifying new and existing technologies to assist in making the hand-off successful, and stating expectations about how to conduct a successful hand-off.
- **Allow opportunity to ask questions**, which includes using critical thinking skills when discussing a patient’s case as well as sharing and receiving information as an interdisciplinary team (for example, a pit crew). Receivers should expect to receive all key information about the patient from the sender, receivers should scrutinize and question the data, and the receivers and senders should exchange contact information in the event there are any additional questions.
- **Reinforce quality and measurement**, which includes demonstrating leadership commitment to successful hand-offs such as holding staff accountable, monitoring compliance with use of standardized forms, and using data to determine a systematic approach for improvement.
- **Educate and coach**, which includes organizations teaching staff what constitutes a successful hand-off, standardizing training on how to conduct a hand-off, providing real-time performance feedback to staff, and making successful hand-offs an organizational priority.

The Hand-off Communication Targeted Solution Tool™ was created to measure the effectiveness of hand-offs within an organization or to another facility and provide proven solutions to improve performance. More information on SHARE and access to the tool is available at <http://www.centerfortransforminghealthcare.org/projects/detail.aspx?Project=171>.

2.5.4 Tools for Risk or Hazard identification and Adverse Event or Incident Analysis

As discussed previously in Chapter 1, high reliability organizations have successfully created open and non-punitive reporting systems of safety hazards, potential adverse events (near misses), and actual adverse events. Traditional reporting

and surveillance systems, such as those described on page 45, should be supplemented with real-time reporting strategies to further combined analysis of patient and worker safety data. In fact, recent research has shown that traditional paper-based reporting systems capture neither near miss events nor a significant number of actual adverse events.^{72–74} Ultimately, the true value of data lies in analysis and intervention as depicted in the stages of the feedback loop (see Figure 2-5, page 46). Analyzing events and data provides the high reliability organization with rich learning opportunities, an organization-specific risk profile, and direction for risk mitigation and quality improvement activities.

There are many established tools and strategies for risk and hazard assessment and adverse event/incident analysis. The following section introduces a few of the strategies.

2.5.4.1 Failure Modes and Effects Analysis (FMEA)

FMEA is defined by the IHI as “a systematic, proactive method for evaluating a process to identify where and how it might fail, and to assess the relative impact of different failures in order to identify the parts of the process that are most in need of change.”⁶³ The goal of an FMEA is to prevent errors by attempting to identify all the ways the process could fail, estimating the probability and consequences of each failure, then taking action to prevent those from occurring.¹⁷

2.5.4.2 Fault Tree Analysis

Fault tree analysis is a logical “top down” method of structuring events and failures leading to a hazard. According to OSHA, a fault tree analysis is a quantitative or qualitative assessment of all the undesirable outcomes which could result from a specific initiating event. It begins with a graphic representation of all possible sequences of events that could result in an incident. The resulting diagram looks like a tree with many roots—each root depicts the sequential events (failures) for different independent paths to the top event. Probabilities (using failure rate data) are assigned to each event and then used to calculate the probability of occurrence of the undesired event. It can also be used to identify critical flaws (single point failures) that, by themselves, can directly set off an uncontrollable sequence of events leading to an undesired outcome. This technique is particularly useful in evaluating the effect of alternative actions on reducing the probability of occurrence of the undesired event.⁷⁵ (http://www.osha.gov/SLTC/etools/safety/health/mod4_tools_methodologies.html). Hyman⁷⁶ provides an example of fault tree analysis applied to harm-related clinical alarm failures.

2.5.4.3 Tracer Methodology for Safety Events

Tracer methodology, useful for analyzing systems and processes for providing care, treatment, and services, can also highlight performance issues within and among those systems. The following three types of tracers can be conducted: *individual* (follows the actual experience of an individual), *system based* (follows a process or system across the entire organization), and *program specific* (analyzes unique characteristics and relevant issues of a specific type of organization.)⁷⁷ Practicing the use of this methodology by conducting mock tracers will develop skills and enhance understanding of the different types. A mock tracer workbook, *Environment of Care Tracer Workbook*, is available that provides guidance in conducting mock tracers.⁷⁸

2.5.4.4 Root Cause Analysis (RCA)

RCA is a process for identifying the basic or causal factor(s) underlying variation in performance, including the occurrence or possible occurrence of a sentinel event.⁷⁷ RCA is now widely used in health care as a tool to analyze errors. It is an intensive form of assessment to determine what factors cause, or explain, an event. The Agency for Healthcare Research and Quality (AHRQ) recommends that RCAs follow a prespecified protocol that begins with data collection and reconstruction of the event through record review and participant interviews. A multidisciplinary team should then analyze the sequence of events leading to the error, with the goals of identifying how (through the identification of active errors) the event occurred and why (through systematic identification and analysis of latent errors) the event occurred.⁷⁹ Consideration of contributing factors should include categories such as institutional/regulatory, organization/management, work environment, team environment, staffing, task-related, and patient characteristics (when appropriate).

The Joint Commission requires that health care organizations complete an RCA in response to a sentinel event (which is “an unexpected occurrence involving death or serious physical or psychological injury, or the risk thereof”).⁸⁰ The analysis is a process for identifying the factors that underlie variation in performance, including the occurrence or possible occurrence of a sentinel event. An RCA focuses primarily on systems and processes, not on individual performance. It progresses from special causes in clinical processes to common causes in organizational processes and systems and identifies potential improvements in these processes or systems that would tend to decrease the likelihood of such events in the future. The product of the RCA is an action plan that identifies the strategies to reduce the

risk of similar events occurring. The plan addresses responsibility for implementation, oversight, pilot testing as appropriate, time lines, and an approach for measuring the effectiveness of the actions.

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Resources 2-2: General Resources on Leadership and Work Environment

Title and Website	Description
Agency for Healthcare Research and Quality (AHRQ) TeamSTEPPS®: National Implementation A teamwork system designed for health care professionals that provides an evidence-based system to improve communication and teamwork skills. Available at: http://teamstepps.ahrq.gov/about-2cl_3.htm	The system promotes the development of “highly effective medical teams that optimize the use of information, people, and resources to achieve the best clinical outcomes for patients.” Complete program materials are available online and in print format, including an instructor guide and comprehensive multimedia toolkit that contains: • Fundamentals modules in text and presentation format • A pocket guide that corresponds with the essentials version of the course • Video vignettes to illustrate key concepts • Workshop materials, including a supporting CD and DVD, on change management, coaching, and implementation.
Report Becoming a High Reliability Organization: Operational Advice for Hospital Leaders Hines S, Luna, K, Lofthus J, et al. Becoming a High Reliability Organization: Operational Advice for Hospital Leaders. (Prepared by the Lewin Group under Contract No. 290-04-0011.) AHRQ Publication No. 08-0022. Rockville (MD): Agency for Healthcare Research and Quality. April 2008. http://www.ahrq.gov/qual/hroadvice/hroadvice.pdf	This document shows how hospital leaders have taken the five basic concepts of high reliability—sensitivity to operations, reluctance to simplify, preoccupation with failure, deference to expertise, and resilience—and used them to develop and implement initiatives that are key to enhanced reliability. The document shows how the concepts have been used to change and respond to the external and internal environment; plan and implement improvement initiatives; adjust how staff members do their work; implement improvement initiatives across a range of service types and clinical areas; and spread improvements to other units and facilities.
AORN (Association of periOperative Registered Nurses), Inc. Journal Article Workplace Safety Equals Patient Safety Spratt D, Cowles CE Jr, Berguer R, Dennis V, Waters TR, Rodriguez M, Spry C, Groah L. Workplace safety equals patient safety. AORN J. 2012 Sep;96(3):235-44. PubMed PMID: 22935253. http://www.sciencedirect.com/science/article/pii/S0001209212007181	This article discusses a variety of topics related to workplace safety, including fire safety, sharps safety, safe patient handling, and smoke in the OR environment. The authors have also solicited general discussions on workplace safety in the OR and the sterile processing department, as well as workplace safety issues from AORN's perspective. The references include links to several toolkits and other resources available from AORN.
Canadian Patient Safety Institute White Paper Teamwork and Communication Working Group. Improving patient safety with effective teamwork and communication: Literature review, needs assessment, evaluation of training tools and expert consultations. Edmonton (AB): Canadian Patient Safety Institute; 2011. http://www.patientsafetyinstitute.ca/English/toolsResources/teamworkCommunication/Documents/Canadian%20Framework%20for%20Teamwork%20and%20Communications.pdf	This document summarizes the literature on effective teamwork and communication strategies. As described by the authors, it provides a framework for organizations to understand and convey to their teams the importance and impact of teamwork and communication in healthcare, and to select appropriate training tools to improve this.

Resources 2-2: General Resources on Leadership and Work Environment (continued)

Title and Website	Description
Centers for Disease Control and Prevention (CDC)	
National Healthy Worksite Program http://www.cdc.gov/nationalhealthyworksite/about/index.html Webinar series http://www.cdc.gov/nationalhealthyworksite/webinar/registration.html	The National Healthy Worksite Program is designed to assist employers in implementing science and practice-based prevention and wellness strategies that will lead to specific, measurable health outcomes to reduce chronic disease rates. The National Healthy Worksite Program seeks to promote good health through prevention, reduce chronic illness and disability, and improve productivity outcomes that contribute to employers' competitiveness.
Department of Veterans Affairs, Veterans Health Administration (VHA)	
Kapinos KA, Fitzgerald P, Greer N, Rutks I, Wilt TJ. The Effect of Working Conditions on Patient Care: A Systematic Review. VA-ESP Project #09-009; 2012. The Effect of Working Conditions on Patient Care (intranet only) 01-2012 http://www.hsrd.research.va.gov/publications/esp/reports.cfm	This report is based on research conducted by the Evidence-based Synthesis Program (ESP) Center located at the Minneapolis VA Medical Center, Minneapolis, MN, funded by the Department of Veterans Affairs, VHA, Office of Research and Development, Health Services Research and Development. The purpose of this report was to systematically review the evidence on the role of primary care providers' workplace conditions in influencing patient outcomes. The researchers focused on patient satisfaction, safety, and quality of care for patient outcomes.
European Agency for Safety and Health at Work	
Occupational health and safety risks in the healthcare sector — Guide to prevention and good practice http://osha.europa.eu/en/legislation/guidelines/sector_specific/occupational-health-and-safety-risks-in-the-healthcare-sector-guide-to-prevention-and-good-practice The content is divided as follows: 1. Prevention and health promotion as a management task 2. How to carry out a risk assessment 3. Biological risks 4. Musculoskeletal risks 5. Psychosocial risks 6. Chemical risks	The focus of this guideline is to present up-to-date technical and scientific knowledge regarding the prevention of the most significant risks in health care (especially biological, musculoskeletal, psychosocial, and chemical risks), and to support the implementation of the relevant European Union directives. Practical instruments to support employers in identifying the risks for the safety and health of their employees, and to guide the implementation of preventive measures in their health care facilities are outlined and clarified on 284 pages. The manuscript was completed in December 2010.
Health Research and Educational Trust	
White Paper Pathways for Patient Safety™—Module One: Working as a Team Health Research & Educational Trust; Institute for Safe Medication Practices; Medical Group Management Association Center for Research; ISMP, 2008. <i>Supported by a grant from The Commonwealth Fund.</i> http://www.hret.org/quality/projects/resources/working_as_a_team.pdf	This document, the first of a three-module set, contains information, strategies, and tools designed to improve teamwork and communication. Includes information about CUS model and TeamSTEPs.

Resources 2-2: General Resources on Leadership and Work Environment (continued)

Title and Website	Description
Institute for Healthcare Improvement (IHI)	
White Paper Leadership Guide to Patient Safety http://www.ihi.org/knowledge/Pages/IHIWhitePapers/LeadershipGuidetoPatientSafetyWhitePaper.aspx	This paper presents eight steps that are recommended for leaders to follow to achieve patient safety and high reliability in their organizations. Each step and its component parts are described in detail in the sections that follow, and resources for more information are provided where available.
National Institute for Occupational Safety and Health (NIOSH)	
Website across numerous topics http://www2a.cdc.gov/nioshtic-2/ Workplace Safety & Health Topics: HEALTHCARE WORKERS Search NIOSHTIC-2, a bibliographic database of occupational safety and health publications, documents, grant reports, and journal articles supported in whole or in part by NIOSH.	Subheadings with content on this site include: • general resources • biological hazards and controls • chemical hazards and controls • physical hazards and controls • work organization • reproductive health • dentistry • emergency preparedness and response • surveillance and statistics • related sites
Publication The Changing Organization of Work and the Safety and Health of Working People http://www.cdc.gov/niosh/docs/2002-116/	This publication discusses sweeping changes in the organization of work that have been influenced by major economic, technological, legal, political, and other forces.
Home Healthcare Worker “Fast Facts” Sheets http://www.cdc.gov/niosh/pubs/fact_date_desc_nopub_numbers.html a) NIOSH Hazard Review: Occupational Hazards in Home Healthcare Department of Health and Human Services (DHHS) (NIOSH) Publication No. 2010-125 (January 2010) b) NIOSH Fast Facts: Home Healthcare Workers – How to Prevent Needlestick and Sharps Injuries DHHS (NIOSH) Publication No. 2012-123 (February 2012) c) NIOSH Fast Facts: Home Healthcare Workers – How to Prevent Driving-Related Injuries DHHS (NIOSH) Publication No. 2012-122 (February 2012) d) NIOSH Fast Facts: Home Healthcare Workers – How to Prevent Exposure in Unsafe Conditions DHHS (NIOSH) Publication No. 2012-121 (February 2012)	a) This document describes occupational hazards in home health care (e.g., musculoskeletal overexertion, violence, needles, and bloodborne pathogens, etc.) and suggests preventive strategies for employers and workers. b) This document presents examples of activities with potential for needlestick injuries and provides measures that employers and employees can take to prevent needlestick and sharps injuries in home healthcare settings. c) This document describes measures employers and employees can take to prevent car accidents when home health care workers are driving from client to client. d) This document describes measures employers and employees can take to prevent exposure to unsanitary conditions, temperature extremes, hostile animals, and other hazards when working in the homes of their clients.
<i>Continued on next page</i>	<i>Continued on next page</i>

Resources 2-2: General Resources on Leadership and Work Environment (continued)

Title and Website	Description
National Institute for Occupational Safety and Health (NIOSH) [continued]	
e) NIOSH Fast Facts: Home Healthcare Workers – How to Prevent Musculoskeletal Disorders DHHS (NIOSH) Publication No. 2012-120 (February 2012)	e) This document describes measures employers and employees can take to prevent work-related musculoskeletal disorders associated with lifting and moving clients in home health care settings.
f) NIOSH Fast Facts: Home Healthcare Workers – How to Prevent Latex Allergies DHHS (NIOSH) Publication No. 2012-119 (February 2012)	f) This document describes the types of reactions that can occur when using latex products and measures employers and employees can take to prevent latex allergies in home health care settings.
g) NIOSH Fast Facts: Home Healthcare Workers – How to Prevent Violence on the Job DHHS (NIOSH) Publication No. 2012-118 (February 2012)	g) This document describes measures employers and employees can take to prevent violence, ranging from verbal abuse, to stalking or threats of assaults, to homicide in home health care settings.
h) Risk Factors Associated with Patient Assaults of Home Healthcare Workers Rehabil Nurs 2010 Sep/Oct; 35(5):206-215 http://www.cdc.gov/niosh/programs/hcsa/pubs.html	h) This study used surveys from 677 home health care aides and nurses to explore factors associated with assaults by patients. Among respondents, 4.6% reported one or more patient assaults (being hit, kicked, pinched, shoved, or bitten) during the past year.
The Joint Commission	
White Paper Health Care at the Crossroads: Guiding Principles for the Development of the Hospital of the Future http://www.jointcommission.org/assets/1/18/Hospital_Future.pdf	This white paper addresses broad issues relating to the provision of safe, high-quality health care and, indeed, the health of the American people. The white paper represents the culmination of a roundtable discussion. Proposed principles for guiding future hospital development are summarized.

– Chapter 3 –

Specific Examples of Activities and Interventions to Improve Safety

As discussed in the preceding chapters, a high reliability organization incorporates safety as a core value and successfully integrates safety into *the way it does business*. Although health care settings are varied and present both common and unique safety issues, interventions to improve safety for patients often also improve safety for workers. Very rarely do interventions targeting patient safety conflict with safety goals for workers and vice versa.

In this chapter, several topics have been selected that demonstrate the synergy between health care worker and patient safety. These topics are as follows:

- Musculoskeletal injuries resulting from patient handling and slips, trips, and falls
- Sharps injuries and infection transmission
- Hazardous drugs, chemicals, and radiation
- Violence in the health care setting
- Staffing, fatigue, and health care–induced emotional distress

Abundant literature and resources are available on these topics, reflecting their impact on patients or health care workers. Therefore, this chapter is not intended to provide a comprehensive review of each topic but rather to encourage discussion of the relationship between patient and worker safety in these areas and highlight the value of coordinating safety efforts. Sample resources are included and for several topics, actual organizational practice examples that address both patient and worker safety are described.

3.1 Musculoskeletal Injuries and Accidents

3.1.1 Safe Patient Handling

Few activities in health care link patient and worker safety more directly than lifting, transferring, repositioning, and ambulating patients. As part of the larger science of ergonomics dealing with the intersection of physical work requirements and the capacity of the worker, patient handling is a high risk activity for work-related musculoskeletal injuries (see Chapter 2, page 35). These injuries are often grouped under the heading of musculoskeletal disorders (MSDs). Back injuries represent a large percentage of MSDs; however, injuries can also involve the neck, shoulders, wrists, and knees.^{1,2}

Despite a significant body of evidence that manual patient handling is not safe for patients or health care workers, changing the practice has been difficult. While MSD injuries have declined in most industries in recent years, rates for nurses in the health care industry have not declined during the same period.³ Research on safe patient handling techniques has demonstrated that injuries can be reduced when manual handling is eliminated to the greatest extent possible. Internationally, other countries have enacted legislation and implemented policies to address risks involved in patient handling. In 1992, the United Kingdom was the first country to enact a national policy that applied minimum ergonomic standards to reduce the injury rate associated with manual patient handling.⁴ Risks are inherent in moving and lifting patients and can originate as a result of both workplace and human factors. The National Institute for Occupational Safety and Health (NIOSH) has identified risks within system elements across three health care settings (Table 3-1, pages 63–64).

Most health care workers in the United States have been taught the use of “proper” body mechanics and transfer techniques, such as the hook-and-toss method, which have been shown to be unsafe.⁴ Other common practices include manual patient lifting and use of back belts. A growing body of evidence questions the effectiveness of these techniques in reducing injuries and promoting safe patient handling.⁴ Proven effective techniques include the following:

- Selection of appropriate mechanical patient-handling equipment and devices^{1,4}
- Sufficient training on proper operation of lifting equipment^{1,4}

- Accurate completion of patient mobility assessment matched to equipment and protocols¹⁻⁴
- Safe-lifting policies and procedures¹⁻⁴
- Specialized patient lift teams when available^{1,4}

According to 2009 data from the Bureau of Labor Statistics (BLS), registered nurses, nursing assistants and orderlies, and licensed practical nurses suffered the highest prevalence and reported the most annual cases of work-related back pain involving days away from work in the health care and social assistance sector.⁵ Emergency medical personnel are also at risk. In fact, health care workers and patients are at risk for injuries related to handling anywhere care is delivered, including hospitals, long term care facilities, outpatient treatment centers, specialty care institutions, and home care.

3.1.1.1 Impact on Patients and Workers

Work-related MSDs such as back and shoulder injuries experienced by nurses and patient care staff are among the highest of any occupation. In addition to sudden onset injuries, MSDs occur as a result of the cumulative effect of long-term and repeated overexertion over the course of a working lifetime.¹ Data collected in 2007 showed that nursing assistants, orderlies, and attendants experienced a rate of MSDs seven times higher than the national MSD average for all occupations.³ Also, the nursing profession is typically listed as one of the top 10 occupations with the highest annual incidence rates for sprain and strain injuries.³

Although the number of reported injuries is alarming, underreporting of injuries is also a significant issue. Reasons for underreporting are varied but include the difficulty in linking symptoms to specific work-related risk factors and resistance to reporting injuries and/or filing for workers' compensation.⁶ MSDs result in significant costs, both personal and financial. Back pain and injury lead some nurses to consider transferring jobs or even leaving the profession altogether.⁷ In addition to the direct costs of injury treatment and workers' compensation payments, there are indirect costs associated with temporary or permanent personnel replacement.

Patients are also at risk of multiple injuries and adverse events related to handling procedures. These include pain and discomfort as well as anxiety connected with being moved. Physical outcomes can include fractures from being dropped during lifting activities, shoulder damage from manual lifting/repositioning, and bruises and skin tears.⁴ Transfer and lifting equipment use can also lead to injuries when patient characteristics (for example, weight, functional

Table 3-1: Examples of NIOSH-Identified Risks for Musculoskeletal Injuries in Health Care Settings

System Element	Hospital	Nursing Home	Home Care
Environment	1. Patient transfer needs are rarely considered in building design and layout of critical areas such as patient rooms, surgery suites, emergency room, etc. 2. Installation of ceiling lifts is often structurally inadequate. 3. Room design limits use of mechanical lifts, especially access to patient bathroom. 4. Lack of storage for equipment. 5. Patient transport over carpeting, poorly functioning wheels on carts, and transfers from carts to stationary imaging tables.	1. Financial constraints on institution due to lower reimbursement by federal/state agencies. 2. Old facilities with inadequate structures for ceiling lifts or storage for floor lifts. 3. Room layout often too confined for equipment-related transfers. 4. Bathroom layout/size is inadequate for two caregivers and equipment access.	1. Confined areas obstructed with furniture, equipment, etc. 2. Inaccessible bathrooms.
Work Organization	1. Staff turnover—challenge of training new hires. 2. Long shifts, mandatory overtime leading to mental and physical exhaustion. 3. Perceived increase in time required to use transfer equipment leads to manual handling of patients. 4. Lack of training and reinforcement on use of equipment due to competing demands. 5. Use of temporary/agency staff without adequate training in equipment use.	1. Lack of safe lifting policies 2. Shortage of skilled staff. 3. High turnover of management and workers creates challenges in training all newly hired caregivers. 4. Low wages with limited benefits. 5. Limited time for training due to competing demands. 6. Perception that it often takes too much time to find and use lifting equipment and repositioning devices.	1. Health care workers often work alone without assistance. 2. Work schedules are overloaded with too many patients. 3. Higher acuity and increased number of patients at home due to shorter hospital stays. 4. Lack of control over work planning.
Technology/ Equipment	1. Ceiling lifts are expensive to install unless remodeling or new construction. 2. Equipment mounted to hospital structure requires construction approval. 3. Slings are difficult to place on patients—especially bariatric. 4. Time to locate and obtain mechanical devices. 5. Difficult to provide sufficient training to all staff who handle patients.	1. Inadequate mechanical equipment and devices to lift and reposition residents. 2. Sufficient slings of adequate size are often not available. 3. Slings can be lost or misplaced when laundered. 4. In some cases, the maintenance department does not have a tagout procedure for identifying broken equipment and repair procedures for servicing equipment and transferring devices.	1. Lack of mechanical lifting devices. 2. Beds are generally not adjustable.

Table 3-1: Examples of NIOSH-Identified Risks for Musculoskeletal Injuries in Health Care Settings (continued)

System Element	Hospital	Nursing Home	Home Care
Tasks	1. Patient transfers, lifting, and repositioning. 2. Patient transport. 3. Care procedures require awkward positions (for example, feeding, wound care) 4. Rapid patient turnover and condition change demand frequent assessment and quick adjustment by nursing staff. 5. Diagnostic and treatment procedures may require awkward postures, patient handling, and static high hand forces by staff in radiology, imaging, occupational, and physical therapy.	1. Transferring residents from very low beds to wheelchairs requires extreme back flexion and twisting, neck extension, and high back and shoulder loading. 2. Repositioning in bed requires forceful, awkward postures. 3. Dressing, feeding, and personal care assistance requires awkward postures. 4. Many residents suffer from dementia and are easily confused and agitated, particularly during a transfer, resulting in combative behavior.	1. Frequent lifting and repositioning while bending, stooping, twisting, and reaching over low beds to assist with wound care, bathing, etc. 2. Increasing size of patients makes it difficult to obtain a firm grip. 3. Postural instability of patients. 4. Combateness of agitated or confused patients. 5. Health care workers also perform physically demanding housekeeping activities including cleaning, cooking, laundry, and shopping. In some cases these types of tasks have been found to represent an equal or greater risk of injury to home care workers than patient care tasks.
Workers	1. Strength requirements of lifting and moving patients often exceed the lifting capacity of health care workers. 2. Largely female workforce. 3. No time for training. 4. Perceived increase in time to use equipment. 5. Perceptions and habits focus on the patient, not on oneself. 6. Belief that manual lifting and transfers “are part of the job.” 7. Taught in school in the use of “good body mechanics” and “safe lifting/transfer techniques.”	1. Certified nursing assistants are often female, unskilled, in their first job, and speak English as a second language. 2. Caregivers are exposed to excessive psychological and physical job demands.	1. Home health care workers are aging and approximately 90% female. 2. Often unaware of risks or access to alternative methods of handling clients.

Adapted from source: US Department of Health and Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health [Internet]. State of the Sector | Healthcare and Social Assistance: Identification of Research Opportunities for the Next Decade of NORA. DHHS (NIOSH) Publication Number 2009-139. Available from: <http://www.cdc.gov/niosh/docs/2009-139>.

capability) are not properly matched to equipment capacities, equipment is not well maintained, or employees have not been trained or are not proficient in its use.

3.1.1.2 Examples of Interventions

Evidence-based solutions that reduce injuries and increase patient and worker safety have been identified.^{8,9} While different care settings, caregivers, and patients require targeted methods and application-specific solutions, some general approaches have proven effective. Nelson and Baptiste⁴ have suggested the following three categories of control solutions: engineering, administrative, and behavioral. Sidebar 3-1 shows examples of controls within each category. For more information on the hierarchy of controls, see Chapter 2, Section 2.2.

Regardless of the care setting, effective solutions will require active participation of caregivers and patients to overcome

barriers to using new techniques and practices. Transfer and lifting equipment may induce anxiety and will require time, cooperation, and training for successful implementation. However, attention to the issue of safe patient handling has helped stimulate research, introduce new interventions, and expand the evidence base for practice with the promise of improved health and safety for patients and workers. Collins et al.¹⁰ identified benefits for residents, employers, and caregivers gained from implementing a safe resident lifting program in a nursing home (Table 3-2, page 66). Other health care settings may realize similar benefits after implementing a safe patient lifting program.

Many organizations are making safe patient handling a priority for the benefit of patients and staff. Two examples of organizational approaches will be studied. One organization identified a special-need patient population, while the other addressed implementing a program across a large multihospital system.

Sidebar 3-1: Interventions to Reduce Injuries and Increase Patient and Worker Safety

- **Engineering Controls:** Modifications to the work environment that create permanent changes to mitigate risk
 - Room design, access, and layout
 - Mechanical lifting devices such as ceiling-mounted or mobile equipment
 - Raised toilet seats, grab bars, and other assistive devices
 - Beds with adjustable height positions and other adaptive features
- **Administrative Controls:** Policies, procedures, and practices enacted by organizational management or legislative action, as well as guidelines, recommendations, and position statements of professional associations and official agencies
 - Safe-lifting policies. These policies are intended to match transfer and repositioning techniques to the physical and cognitive status of the patient and require that proper engineering controls and infrastructure (patient assessment tools, staff education) be established.
 - Ergonomic assessment protocols for patient care. Standardized tools to determine patient characteristics (for example, combativeness and ability to bear weight, assist with transfers, and other mobil-

ity limitations) and match these to appropriate equipment and procedures.

- Patient lift/transfer teams. Selected staff who have received specialized training in the use of mechanical equipment and assist with high risk lifts/transfers. Creating a “lift team” does not address patient handling tasks such as repositioning, and it may be difficult to find qualified and willing individuals. In addition, the demand across an entire facility may exceed team resources.
- **Behavioral Controls:** Educational tools and training to reduce risks to caregivers associated with patient handling.
 - Education and training in the proper use of patient handling equipment coupled with proper body mechanics.
 - Deployment of safety leaders to serve as role models, educators, and unit-based resources.
 - Cultural change from expectation that manual lifting is “part of the job” and perception of need to place personal health and safety second to patient/job requirements.

Adapted from source: Nelson A, Baptiste A. Evidence-based practices for safe patient handling and movement. Online J Issues Nurs [Internet]. 2004 Sep 30 [cited 2011 Oct 11];9(3 Suppl 3). Available from: <http://www.nursingworld.org/MainMenuCategories/ANAMarketplace/ANAPeriodicals/OJIN/TableofContents/Volume92004/No3Sept04/EvidenceBasedPractices.aspx>.

Table 3-2: Benefits of a Safe Patient-Resident Lifting Program

Benefits for Patients/Residents	Benefits for Employers	Benefits for Caregivers
Improved quality of care	Reduced number and severity of staff injuries	Reduced risk of injury
Improved patient/resident safety and comfort	Improved patient/resident safety	Improved job satisfaction
Improved patient/resident satisfaction	Reduced workers' compensation medical and indemnity costs	Increased morale
Reduced risk of falls, being dropped, friction, burns, dislocated shoulders	Reduced lost workdays	Injured caregivers are less likely to be reinjured
Reduced skin tears and bruises	Reduced restricted workdays	Pregnant caregivers can work longer
	Reduced overtime and sick leave	Staff can work to an older age
	Improved recruitment and retention of caregivers	More energy at the end of the work shift
	Fewer resources required to replace injured staff	Less pain and muscle fatigue on a daily basis

Source: Collins JW, Nelson A, Sublet V; Department of Health and Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health. Safe Lifting and Movement of Nursing Home Residents [Internet]. Cincinnati (OH): NIOSH-Publications Dissemination; 2006 Feb [cited 2011 Oct 11]. Available from: <http://www.cdc.gov/niosh/docs/2006-117/>.

Resources 3-1: Safe Patient Handling

Title and Website	Description
American Nurses Association (ANA)	
Brochures and Toolkits Patient Care Ergonomics Resource Guide: Safe Patient Handling and Movement http://nursingworld.org/MainMenuCategories/WorkplaceSafety/Safe Patient	This site links the reader to information, brochures, and toolkits from the ANA Nursing World on safe patient handling.
ANA Handle with Care® Program http://www.nursingworld.org/MainMenuCategories/Occupationaland Environmental/occupationalhealth/handlewithcare.aspx	An industry-wide effort designed to prevent back and other musculoskeletal injuries among the nation's nurses.

Resources 3-1: Safe Patient Handling (continued)

Title and Website	Description
Association of Occupational Health Professionals (AOHP) Beyond Getting Started: A Resource Guide for Implementing a Safe Patient Handling Program in the Acute Care Setting http://www.aohp.org/About/documents/GSBeyond.pdf	
Department of Veterans Affairs (VA), Veterans Health Administration (VHA) Veterans Affairs Safe Patient Handling Program http://www.visn8.va.gov/patientsafetycenter/safePtHandling	This resource guide addresses patient handling with the goal of providing the necessary tools for the occupational health professional in health care to implement a safe patient handling program.
Department of Veterans Affairs Safe Patient Handling and Movement http://www.visn8.va.gov/visn8/patientsafetycenter/	There are multiple guides, toolkits, and algorithms for safe patient handling and movement available for downloading.
National Institute for Occupational Safety and Health (NIOSH) Safe Patient Handling Index http://www.cdc.gov/niosh/topics/safepatient/ Safe Lifting and Movement of Nursing Home Residents Department of Health and Human Services (DHHS) (NIOSH) Publication Number 2006-117 (February 2006) http://www.cdc.gov/niosh/docs/2006-117/	
Curricular Materials Safe Patient Handling Training for Schools of Nursing DHHS, NIOSH, Veterans Health Administration (VHA), and the ANA November 2009 http://www.cdc.gov/niosh/docs/2009-127/pdfs/2009-127.pdf	This site provides safe patient handling resources and links the reader to published research, practical guidance, and conference information related to safe patient handling. This guide also provides a business case and is intended for nursing home owners, administrators, nurse managers, safety and health professionals, and workers who are interested in establishing a safe resident lifting program.
Report Collins J, Silverstein B, and Stock L. Chapter 11: Musculoskeletal Disorders and Ergonomic Issues In: US Department of Health and Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health [Internet]. State of the Sector Healthcare and Social Assistance: Identification of Research Opportunities for the Next Decade of NORA. DHHS (NIOSH) Publication Number 2009-139. Available from: http://www.cdc.gov/niosh/docs/2009-139	A curriculum designed to provide evidence-based training on safe patient handling to instructors of nursing for use in nursing education programs as well as for use by health care groups for retraining current nurses and other health care workers. Provides a full range of educational tools and links to Tool Kit for Safe Patient Handling and Movement Training Program. This 236 page document, developed by the NORA Healthcare and Social Assistance Sector Council, addresses the "state of the sector", including magnitude and consequences of known and emerging health and safety problems, critical research gaps, and research needs that should be addressed over the next decade of NORA. Chapter 11 discusses musculoskeletal disorders and ergonomic issues.

Resources 3-1: Safe Patient Handling (continued)

Title and Website	Description
Occupational Safety and Health Administration (OSHA)	
Website OSHA – Voluntary Protection Program http://osha.gov/dcsp/vpp/index.html	A voluntary program that recognizes successful applicants who have implemented safety and health management systems and maintain injury and illness rates below national BLS averages for their respective industries.
Washington State	
Safe Patient Handling Program http://washingtonsafepatienthandling.org/	Developed by the Safe Patient Handling Steering Committee in Washington State to assist hospitals in implementing a safe, cost-effective patient handling program.
Work Injured Nurses' Group (WING)	
Website WING USA http://www.wingusa.org	Group that provides information and personal support to nurses affected by injury or ill health through a newsletter and dedicated advice line. Members can get advice on rights, government benefits, and support from others who have "been there." Membership is free and also open to interested parties.

CASE STUDY 3-1: LANCASTER VOLUNTARY PROTECTION PROGRAM: COMMITMENT TO BARIATRIC PATIENT SAFETY

Lancaster General Hospital Lancaster, Pennsylvania

In 2007, Lancaster General became an OSHA Voluntary Protection Program (VPP) site. This program recognizes “employers and workers in the private industry and federal agencies who have implemented effective safety and health management systems and maintain injury and illness rates below national BLS averages for their respective industries. In VPP, management, labor, and OSHA work cooperatively and proactively to prevent fatalities, injuries, and illnesses through a system focused on: hazard prevention and control; worksite analysis; training; and management commitment and worker involvement.”* Dedicated leadership commitment and an organizational focus on

safety for patients and employees led to further recognition as a star site within the VPP program. As safety became integral to the work environment, new opportunities to improve worker and patient safety were identified. Examples of programs that integrate patient and worker safety at Lancaster General include a fall prevention program and the Image Gently program† for patients as well as electronically tracking total x-ray exposure for employees.

One opportunity, the bariatric patient initiative, was identified when facility resources were insufficient to meet requirements of care for an individual whose weight exceeded existing capacity. By integrating the focus on employee safety modeled in the VPP program with patient safety goals, this initiative exemplifies the value of using a combined approach to patient and worker safety.

Developing a Strategic Plan to Serve Bariatric Patients

The vice president of operations became the project’s executive sponsor, and the Bariatric Steering Committee was formed under the joint leadership of the director of nursing

and the manager of employee and student health and safety. The task force included diverse representation from departments such as materials management, transport, environmental services, dietetics, nursing, pharmacy, and so on. Using performance improvement methodology and VPP approaches, the task force assessed the current resources (gap analysis) to serve this population and conducted a patient survey. To understand the current health care experiences of bariatric patients, an online survey with a sample of residents living in the Lancaster General markets and service areas was completed. To be eligible for participation, respondents had to weigh 250 pounds or more. Objectives of the survey were to:

- Identify obstacles or barriers in getting care; and
- Identify ways to improve the bariatric patient experience.

A total of 213 persons participated in the survey, the results of which provided the patient's perspective. Additionally, a process improvement engineer was engaged in a walkthrough of the entire facility to assess the potential safety risks posed for a bariatric patient and health care staff during a hospitalization. The walk-through considered all the different ways a bariatric patient might enter the system and all the departments that might be accessed for care. As a result of the evaluation process, barriers to care were documented as well as safety hazards that staff might encounter while caring for these patients. Priority areas were selected and workgroups were created to address specific issues. For example, a subgroup examined current equipment and evaluated additional needs. Finally, a facility-wide assessment was conducted to evaluate existing structures (such as door widths), diagnostic equipment (such as diagnostic tables/chairs), and fixtures and mobility devices (for example, wall toilets and wheel chairs).

Identifying Barriers to Implementing a Bariatric Patient Care Program

Several obstacles were identified while planning for a bariatric patient care program. One of the first obstacles identified was the lack of consistently available patient weight and body mass index (BMI) data to identify the bariatric patient population. Another potential barrier was a general lack of knowledge about, and cultural attitudes toward, the bariatric population. Structural and functional barriers involved building design and the cataloging, tracking, and storing of bariatric equipment. Finally, staff was unfamiliar with the appropriate selection and use of new equipment.

A Bariatric Patient Care Program to Protect Patients and Health Care Workers

Following the organizational needs assessment and identification of program barriers, the task force designed a comprehensive program to care for this population that considers safety for patients and staff. First, an educational curriculum was designed to provide information about cultural attitudes and sensitivities in caring for the bariatric patient. All patient care staff received this education. Patient weight and BMI data were made available to facilitate proper care planning. The electronic medical record alerts staff to special patient needs and allows staff to select orders when the individual's BMI is greater than 35. For example, a nutritional assessment should be completed, as experience has shown that this population may actually be malnourished in essential nutrients.

A mobilization assessment tool was created and incorporated into the existing fall prevention assessment that is completed every 24 hours. All nursing staff received training in the completion of this assessment and the selection of equipment and care processes to match mobility needs. Laundry personnel were educated in caring for the slings used with the new equipment. Special bariatric rooms were created that have ceiling lifts capable of carrying up to 1,000 pounds, while other rooms have been equipped with ceiling lifts with a 600-pound capacity. In addition, use of a patient air-lift and transfer system was instituted. To assist staff with proper equipment selection, an online resource and a spreadsheet detailing lift devices and other equipment along with their weight limits was created and provided to nursing supervisors. A special storage area was designed and the location of each piece of equipment was also provided to facilitate quicker access. Visual clues included the use of red blankets on the beds of patients requiring more supervision. When admissions are planned in advance, a bariatric bundle including a bed, commode, walker, and wheelchair as well as a lift, if needed, is prepared and made available prior to the patient's arrival.

Other facility changes have addressed structural barriers. Safety enhancements have been added to wall toilets and diagnostic equipment chairs. Door widths and related construction has been completed to accommodate bariatric devices such as specialty wheel chairs. Finally, needs such as specially sized patient gowns have been addressed. Taken together, all components of the program have resulted in heightened awareness of how to safely and comfortably meet the care needs for the bariatric patient.

Improvement in employee injury data has been documented since program implementation. There has been a 30% decrease in OSHA recordable injuries associated with lifting and assisting patients out of bed between 2007 and 2009 (program initiated in 2008). This translates into a potential cost savings of \$21,000 per year based on an average injury cost of \$3,000.

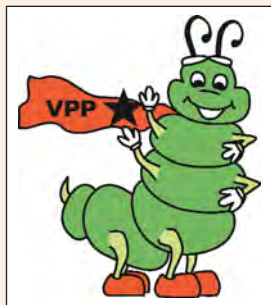
Making Safety an Organizational Value

The bariatric program is a good example of the integrated patient and worker safety planning used at Lancaster General Hospital. Representatives from all departments, patient safety, and a variety of job positions contribute to committees supporting work site analysis and hazard assessment. Focusing on safety is contagious and has become a way of life within the organization. While safety is serious business, making it visible and fun is also important to promoting success. Baxter, a safety mascot, attends organizational events and randomly greets employees upon arrival or exiting the elevator and at new

employee orientation (see Case Study Figure 3-1). The safety logo is visible on all initiatives (for example, flu shot campaign, hand-washing reminders, driving slowly in the parking lot) and on pins given to staff. For Lancaster General Hospital, connecting patient and worker safety makes sense; employee safety leads to patient safety and vice versa.

Case Study References

- * Occupational Safety and Health Administration [Internet]. Voluntary Protection Program (VPP); [cited 2011 Sep 26]. Available from: <http://www.osha.gov/dcsp/vpp/index.html>.
- † Society of Pediatric Radiology [Internet]. Image Gently Campaign; c2011 [cited 2012 Jan 31]. Available from: <http://www.imagegently.org>.



Case Study Figure 3-1: Baxter (Safety Mascot) and Baxter with Staff at Voluntary Protection Program Survey (Lancaster General Hospital)

Baxter and Lancaster Staff at VPP Survey

Source: Lancaster General Hospital. Lancaster, PA. Used with permission.

CASE STUDY 3-2: INTERMOUNTAIN HEALTHCARE: AN INTEGRATED EMPLOYEE AND PATIENT SAFE HANDLING PROGRAM

Intermountain Healthcare Salt Lake City, UT

A program protecting staff and patients from injury related to transfers, lifting, and falls is a key strategy for safe, high-quality care at Intermountain Healthcare (IH). This non-profit system consists of 22 hospitals and more than 100 clinics in Utah and Idaho. Leadership at Intermountain launched a team in 2006 to evaluate transfer and lifting risks, injuries, and prevention programs. The team's goal was to reduce patient and employee injuries by building and implementing a comprehensive Safe Patient Handling program. The team is led by the central office patient safety coordinator and employee health director with team members from risk management, nursing leadership, education services, and frontline staff from each clinical program (such as surgical services, therapy, imaging, nursing, and others).

Creating a Systemwide Safe Patient Handling Program

Analyzing the Current State

The team began with analysis of data. It was noted that between 2004 and 2007, the average number of injuries for all employees was 205 per year at a cost of \$1,483,880. In addition, during the same four-year period an average of 25–30 employees were permanently placed on disability. Since it generally takes 12–18 months to rehire and retrain replacements, this is a significant system loss. Injury reports further demonstrated that high risk activities included repositioning patients (26%), catching a falling patient (17%), and lateral transfers on or off stationary tables or stretchers (22%). Data on patient events/injuries related to lifting and transfers were also analyzed and showed a four-year average of 219 injuries per year with an annual average cost of \$72,019. The most common areas in which patient injuries occurred were general medical-surgical units, inpatient rehabilitation, imaging, and orthopedics.*

The team next examined the experiences of two IH hospitals that had implemented Safe Patient Handling programs previ-

ously and conducted a return on investment analysis. The first hospital, a 25-bed community facility, successfully reduced their employee injuries five-fold within one year of implementing a patient assessment procedure, a lifting team, staff education, and careful monitoring and feedback. Similarly, a three-fold reduction in injuries was realized at the second hospital, a 245-bed medical center.* The center had also targeted staff education, use of lifting equipment, and careful monitoring with feedback to staff and leadership.

Although a Safe Patient Handling program requires a significant investment in equipment, a 30% reduction in employee injuries was projected at IH, resulting in a potential two-year payback. The following potential barriers were identified: funding for lift equipment purchase; resources for education; new assessment tools, policies, procedures and forms; and changing the practice of health care workers (see Case Study Sidebar 3-1, page 72).

Developing and Implementing a Plan

The transfer and lifting team began with objectives for developing a safe patient handling program that:

- implemented a cultural change for safe patient handling, with a focus on the right mix of people and equipment
- established lift and transfer standards for patient-care practices
- included standardized employee education and training
- evaluated and recommended appropriate equipment for transfer and lifting tasks
- reduced employee and patient injury rates

Key elements for program success included commitment from central office leadership that secured the resources for equipment purchase, mid-level management to support new policies, protocols and front-line participation to implement patient assessment, and care planning requirements. A multidimensional program design resulted that included the following:

- Well-trained employees with facility- and unit-level champions
- Mechanical lift and transfer devices, lateral-transfer air mattresses, gait belts, slide sheets, and slide boards
- Standardized protocols and tools
- Patient assessments
- Monitoring of outcomes
- Leadership support

Patient assessment is completed on admission, daily, and when there is a change of condition using special nursing

assessment tools that are imbedded into existing charting (computer and paper). The assessment results in the assignment of one of the following safe patient handling categories:

- Maximum/Full Assist: Two staff members and a mechanical lift device
- Moderate/Partial Assist: One staff and powered lift device or a gait belt
- Minimum/Standby: Stand by to help if needed
- Independent

Wall signs depicting the scoring tool with category criteria are posted at the head of the patient's bed and in staff rooms to provide visual reminders (see Case Study Figure 3-2, page 73). Charting forms incorporate the tool in the medical record for seamless documentation. The computerized tool has decision logic built in to use other patient assessment information and to prompt for specific actions. Staff education includes both hands-on classes as well as computer-based training for new equipment, policy and assessment tools, and skills pass-off checklists. Patients also receive fact sheets with information about safe lifting and transfer practices and procedures. Facility specialists and department level champions within each hospital support program implementation and sustained improvement. Electronic reports for program analysis are available at the departmental, campus, regional, and system level. After almost two years of research, development, and planning, the program was officially launched in 2008 through a progressive quarterly implementation across hospital regions; for example, Urban South (consisting of five hospitals) went first.

Meeting Program Objectives—Sharing Important Lessons

After one year of program implementation (2008–2009) IH employee injury rates were reduced by 42% and patient falls related to transfer were reduced by 45%. By year-end 2010, IH saw a 41% reduction in employee injuries compared to presystem rates and a 49% reduction in patient falls related to lift and transfer activities. The estimated cost savings for employee injuries systemwide is \$500,000 per year across the hospitals. There was also a 15% increase in positive responses to the statement, “*In my department, we have enough time and resources to safely care for our patients*” on the annual employee opinion survey from 2008 to 2009 survey results.

Ensuring initial and ongoing program success requires more than mandates. Recognition and elimination of barriers is

Case Study Sidebar 3-1: Potential Barriers to Safe Patient Handling Initiatives

1. It takes too much money.
2. It takes too much time.
3. It is not a problem here.
4. It is more work to assess patients.
5. Leadership commitment is lacking.
6. Measurement of outcomes is difficult.
7. Educational resources are lacking.
8. It requires changing patient care paradigms.

essential when instituting any change in organizational culture. Active leadership, facility level coordination, system oversight and support of facility specialists, thorough employee education, and adequate resources are critical. Clinical champions increase program acceptance, while departmental managers hold staff accountable for assessment and appropriate use of safe patient handling category-specific recommendations. Data analysis of injuries and cost savings provides feedback to leadership and staff on value and improvement goals. In 2011, IH added equipment resources and undertook an awareness campaign that included posters, stories, skill day fairs, and prize drawings. At Intermountain Healthcare, the Safe Patient Handling program is providing “extraordinary care” to patients and employees.

Source

- * Conti MT, et al. Is your facility equipped for safe patient handling? *Nurs Manage*. 2011 April;42(4):46–47.

3.1.2 Slip, Trip, and Fall

Slip, trip, and fall (STF) injuries are the second-most common cause of lost workday injuries in hospitals¹¹ and present a significant risk in nursing homes and other health care facilities, as well.

Injuries from falls account for a significant portion of health care workplace injuries.⁶ These injuries are generally categorized as falls from elevation or falls on the same level, with the latter being much more common, accounting for 60% of total falls.² Unlike construction where the majority of falls occur from elevation, 89% of the STF incidents in hospitals

Safe Patient Handling Repositioning and Lifting Pediatric Adult Scoring Tool

- Evaluate each patient on admission, daily, after surgery, and / or whenever patient's condition changes.
- Assign each patient a Safe Patient Handling (SPH) category Maximum/Full, Moderate/Partial, Minimal/Stand by, or Independent based on the evaluation.
- Handle the patient as described below for patient category except during therapeutic and/or teaching session (i.e., physical therapy, occupational therapy, etc)

Category	Criteria
Full Assist Two or more staff members recommended AND a Mechanical Standing/Lift Device Check Here _____	Patient meets <u>any</u> of the following criteria: • > 35 lbs (16 kg) and Non-Weight bearing patient • > 70 lbs (32kg) and Weight bears < 50% • Unpredictable in Assistance needed, level of Cooperation or Comprehension, and/or Combative/Agitated • Three or more conditions affecting transfer (see below) • DOS NAMDU = D or U 
Partial Assist Transfer requires one staff member and use of a Gait Belt with standing pivot technique or a Mechanical Standing/Lift Device Check Here _____	Patient meets the following criteria: • > 70 lbs (32 kg) and weight bears 50% to 75% and upper body strength inadequate to support weight • Unpredictable in ability to follow simple commands • First time up after child birth • Two conditions affecting transfer • DOS NAMDU = M 
Stand by Assist Transfer requires stand by assistance with Gait Belt Check Here _____	Patient meets the following criteria: • Full weight bearing and adequate upper body strength to support weight during transfer • Able to follow simple commands (may need verbal prompting) • First time up after child birth • One condition affecting transfer • DOS NAMDU = A
Independent No assist or stand by	Independently performs transfer tasks safely and timely with or without assistive devices
Other Conditions Affecting Transfer: Postural hypotension, Amputation, Cast/Splints / Traction, Unstable spine, Hip / Knee Replacements, Fall History in 3 months (falls risk score ≥ 5), Contractures / Spasms, Fractures, Severe Osteoporosis, Recent abdominal surgery, Paralysis, Presence of ≤ 2 Tubes (e.g., IV, Chest Tube, NG tube), Tracheostomy/Ventilator, Pressure Ulcer, Ostomy, Degree of Sedation (DOS NAMDU score)	

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Case Study Figure 3-2: Safe Patient Handling: Repositioning and Lifting Pediatric Adult Scoring Tool

Source: Intermountain Healthcare. Salt Lake City, UT. Used with permission.

occur on the same level and 11% were falls from elevation that primarily occurred on stairs (6.9%) and from stepstools and ladders (1.7%).¹²

Risk Factors for STF in Health Care Settings

Risk factors are varied and range from structural elements to health care worker footwear. They can occur when there is an unexpected change in contact between an individual's feet and the flooring surface.⁶ Hazards begin with exterior areas of the health care facility, such as parking structures, walkways, stairs, and entrances. Potentially dangerous conditions can be produced by weather-related elements, such as rain, ice, or snow. These factors also contribute to wear and tear on structural elements such as concrete and, if poorly maintained, can result in broken and uneven surfaces. External risks are magnified if there is poor lighting.

Health care facilities have multiple departments with varied risk factors. For example, areas involved in the preparation, delivery, serving, and clean-up of food are at high risk for wet, greasy, and slippery floors, as evidenced by the high rates of STF injuries experienced by food service workers.² Because of their representation in the hospital workforce, nursing staff are the occupational group with the greatest total number of STF-related workers' compensation claims.¹³

Most walking surfaces in hospitals are slip-resistant when they are clean and dry. Contaminants on the floor, such as water, body fluids, spilled drinks, and grease are the leading cause of STF injuries in hospitals.^{12,13} Specialized treatment areas such as the emergency and operating rooms, pharmacy, and radiology may have unique risks.¹⁴ Throughout the health care setting the presence of equipment, scrub sinks, and the need for frequent or specialized cleaning protocols can also contribute to the risk of STF injuries.

3.1.2.1 Impact on Workers and Patients

Although fall prevention in hospitals typically focuses on patients, it is important to recognize the impact on workers, visitors, and others as well. In 2010 a total of 12,400 STF injuries accounted for 21% of all work-related injuries in hospitals requiring at least one day away from work.¹⁵ Also, the BLS reported that the incidence rate of lost-workday injuries from same-level STF injuries in hospitals was 33.8 per 10,000 full-time equivalent (FTE)

workers, which is 73% higher than the average rate for private industry (19.5 per 10,000 FTE).

Older workers (male and female) experience higher rates of injury than younger workers, while female health care workers have higher rates of STF injuries than their male counterparts.² In addition to direct-care staff, organizational employees ranging from auxiliary to support personnel, administrative staff, and especially food service workers, experience STF injuries. Visitors, students, medical staff, volunteers, and others also are at risk for STF injuries within the facility.

Patient falls in health care facilities are a primary safety concern and an identified National Patient Safety Goal for the long term care and home care Joint Commission accreditation programs.¹⁷ Multiple factors place patients at risk for falls while in health care facilities, including compromised cognitive and physical status, disorientation, effects of medication, age, and balance and mobility issues. In a multiyear analysis of 7,082 inpatient falls across nine hospitals in a midwestern health care system, it was found that 1,868 (26.4%) resulted in some type of injury, and 169 (2.4%) resulted in moderate or serious injury.¹⁸ Falls cause physical harm and psychological distress, and fall-related injuries can impair rehabilitation, increase length of stay, and escalate the cost of care.¹⁹

3.1.2.2 Examples of Interventions

Interventions to reduce the risk of falls will often benefit patients and workers alike. Research has been undertaken to identify solutions and develop fall prevention programs for targeted populations based on empirical evidence of risk reduction. With regard to patients, a Cochrane Collaboration systematic review of 41 randomized controlled trials of interventions for preventing falls in older people in nursing care facilities and hospitals found multifactorial team-based interventions to be effective.²⁰

Regarding employee falls, a recently completed 10-year multidisciplinary trial by Bell et al.¹² demonstrated that a comprehensive STF prevention program can be highly effective for reducing the rate of STF workers' compensation claims. Components of the program ranged from use of slip-resistant surfaces, such as nonslip shoes and flooring, water-absorbent mats, hazard assessments, and keeping floors clean and dry. After examining past injury records, interviewing workers who experienced a fall, and studying the performance of slip-resistant surfaces, their

findings confirm that many fall-related injuries could be prevented by mitigating risk factors. Study recommendations begin with conducting a hazard assessment of the facility and outside areas to discover environmental conditions that might increase the risk for an STF. Suggested examples of specific interventions to prevent falls include those shown in Sidebar 3-2.

Sidebar 3-2: Interventions to Prevent Falls

Specific interventions to prevent falls include the following:

- Keep floors clean and dry. Contaminants on walking surfaces such as water, grease, and soap are common risk factors in health care facilities.
 - Promote prompt reporting of observed hazards (such as spills and obstructions) by patients and visitors, as well as staff.*
 - Encourage workers to clean or cover spills promptly.*
 - Install spill clean-up materials such as wall-mounted spill pads or paper towel dispensers throughout the facility and near drinking fountains for quick and easy access.*†
 - Make floor signs readily available to warn of wet or slippery floors.*†
 - Place umbrella sleeves/bags available near building entrances.†
 - Place water-absorbent mats with beveled edges as wide as the entrance area. Ideally, mats should be of sufficient size to remove all water, ice, and snow from the soles of shoes, so that no tracks are on the flooring surface beyond the last mat.*
 - Prominently post and disseminate housekeeping contact information (telephone or beeper numbers) as part of a general awareness campaign.*
- Prevent entry to wet areas
 - Use barriers and special signage to block access to wet areas.*
 - Block off areas where floor wax is being stripped or applied and use a doorstop to prevent wax overflow to adjacent areas.*
 - Promptly remove (within 10 minutes) “wet floor” signs when flooring is dry.*†

Other interventions include providing adequate lighting, hand rails, and grab bars and installing high-tech flooring that contributes to slip prevention and reduces foot fatigue. While some fall prevention interventions involve significant resources, they can also be low cost. An example of a simple, economical but effective intervention is described in Case Study 3-3, page 76.

- Housekeeping
 - Keep walkways clear of objects and reduce clutter.*†
 - Address the risk from electrical and equipment cords in the following ways:
 - Secure loose cords and wires with cord organizers in patient rooms, operating rooms, computer stations, and other high-traffic areas.*†
 - Use retractable cord holders for phones in patient rooms and nursing stations.*
 - Cover cords on floor with a beveled protective cover.*
 - Organize operating rooms to minimize equipment cords across walkways.†
- Ice and snow removal
 - Prominently post and disseminate contact information (telephone or beeper numbers) for snow removal staff.*†
 - Encourage home health and maintenance workers to use ice cleats.*†
 - Conveniently place bins of ice-melting chemicals near outdoor stairs and heavily traveled walkways so that any employee can apply them if they notice icy patches.*†

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Resources 3-2: Slips, Trips, and Falls

Title and Website	Description
National Institute for Occupational Safety and Health (NIOSH)	
Publication Slip, Trip, and Fall (STF) Prevention for Healthcare Workers http://www.cdc.gov/niosh/docs/2011-123/pdfs/2011-123.pdf	Discusses hazards for STF injuries in health care facilities. It also provides specific preventive strategies.
National Safety Council (NSC)	
Information and Links http://www.nsc.org/safety_home/Resources/Pages/Falls.aspx	Links to topics areas on falls prevention and general information.
Occupational Safety and Health Administration (OSHA)	
Hospital Training Tool Hospital eTool http://www.osha.gov/SLTC/etools/hospital/index.html	A stand-alone, interactive, Web-based training tool on occupational safety and health topics. This eTool focuses on some of the hazards and controls found in the hospital setting and describes standard requirements as well as recommended safe work practices for employee safety and health.
Standards 29 CFR 1910 – OSHA Standards http://www.osha.gov/SLTC/healthcarefacilities/standards.html	Standards for health care facilities. Standards addressing flooring conditions and flooring safety are included.

CASE STUDY 3-3: KAISER PERMANENTE: SIMPLE STEPS IMPROVE SAFETY— A SLIP, TRIP, FALL (STF) PREVENTION MEASURE

Kaiser Permanente, Mid-Atlantic States Region

Kaiser Permanente is an integrated care consortium, providing care throughout eight regions in the United States. The Mid-Atlantic Region encompasses the vicinity of Washington, D.C., including Maryland and Virginia. Kaiser Permanente's commitment to a safe and healthful workplace is established: An injury-free workplace is an essential ingredient of high-quality, affordable patient care. Kaiser Permanente has set the

goal of eliminating all causes of work-related injuries and illnesses, so as to create a workplace free of injuries.

The Kaiser Permanente Mid-Atlantic States (MAS) Workplace Safety Department consists of two individuals, a labor Workplace Safety Coordinator and a management partner. This department works closely with the Mid-Atlantic States leaders accountable for health care delivery and operations, physician partners, labor leaders, shop stewards, frontline teams, and staff to engender a culture of safety across the organization. Examining STF data from wet floors and common wet floor conditions at building entrances due to water dripping off wet umbrellas in 2007, the Mid-Atlantic States Workplace Safety Coordinator, management partners, and frontline team representatives pursued an intervention to reduce this fall risk at building entrances. Data showed that STF injuries were experienced

by employees, physicians, patients, visitors, and others. A region-wide goal to reduce the overall number of STF injuries was established for 2008 and has been progressively reset with each new year. The goal was to reduce the actual number of STF incidents due to wet floors by 10–15% each year. In April 2008, umbrella sleeves were introduced as one measure of multiple Workplace Safety performance improvement projects that resulted in a reduction in the number of STF injuries. Use of plastic umbrella sleeves/bags demonstrates how a relatively simple intervention helped contribute to achieving Workplace Safety goals and how this simple measure helped with integrating patient and employee safety efforts and outcomes.

Deploying and Using Umbrella Sleeves/Bags to Reduce STF Risk

Multiple departments including Workplace Safety, Environmental Health & Safety, Employee Health, Nursing, and patient care areas partnered in the successful deployment of the umbrella sleeves. In particular Security, Building Operations, Volunteers, Workplace Safety, and Purchasing departments were involved in plan implementation. Key activities of program planning included identifying and designing a device to store and dispense the sleeves and signage to inform everyone entering the building of umbrella sleeve/bag availability as well as instructions for use.

General communications highlighting objectives and activities related to reducing STF injuries were circulated in 2008 and 2009. Currently, data on the initiative and STF injuries are updated and shared on a regular basis through several communication vehicles, such as a Workplace Safety injury

data website, posters, meetings, seminars, and forums. To further raise awareness STF injuries were featured topics of posters, the “Ten Foot Circle” and “You Can Make a Difference” distributed in 2010 and 2011, respectively. These posters are placed in highly visible locations throughout each building, such as staff break areas and lobby bulletin boards.

Efforts to reduce STFs associated with wet floors appear to have led to a reduced incidence since program implementation. A total of eight patient falls associated with wet floors was reported between 2006 and 2011, which may have been positively impacted by this program. A breakdown of employee STF injuries associated with wet flooring is provided in Case Study Table 3-1.

Expanding the STF Prevention Program

Umbrella sleeves provide a cost-effective intervention that reduces the incidence of wet floors and associated fall risk. Future plans include expanding the program to other regions within the Kaiser Permanente system and investigating ways to make the bags reusable as part of environmental stewardship. The umbrella sleeve intervention is now complemented by additional actions known to reduce flooring-related fall risks. These actions include the following:

- In 2009 and subsequent years, flooring in the medical centers has been replaced with a lower-risk-for-slip flooring product and/or hardwood floors with a low-slip surface. These changes in flooring addressed the STF risk in carpeting that buckled and/or had frayed edges. Lower-risk-for-slip flooring is now recommended for new Kaiser Mid-Atlantic States renovation and construction projects.
- In areas with sinks, the hand-washing soap product was exchanged to a foam soap product thereby reducing the risk for slips from highly slippery soap drips and soap residue.
- In all facility remodels starting 2009–2010, thick fabric mats were installed at building entrances for wicking moisture and removing debris from footwear (similar to function walk-off mats).

In combination with engineering and design changes, and as part of a comprehensive program, the umbrella sleeve intervention lowers the risk for STF injuries associated with wet flooring. Kaiser Permanente successfully applied performance improvement methods and brought together key stakeholders to effectively target a safety issue affecting patients, health care workers, and visitors.

Case Study Table 3-1: Percentage of Employee Falls Due to Wet Flooring

Performance Year	Total Employee STF Injuries	Number Due to Wet Floors	% Total Falls
PY 2009	70	15	21
PY 2010	76	9	11.8
PY 2011 (through 3-31)	59	6	10

3.2 Sharps Injuries and Infection Transmission

3.2.1 Sharps Injuries and Bloodborne Pathogen Exposures

Infectious diseases acquired through occupational exposure to bloodborne pathogens as a result of sharps injuries (percutaneous) or contaminated blood and body fluids (mucocutaneous) present a serious concern for both health care workers and patients. Data from the World Health Organization (WHO) indicates that worldwide 2 million out of 35 million health care workers experience percutaneous exposure to infectious diseases each year²¹ while the Centers for Disease Control and Prevention (CDC) estimates as many as 385,000 sharps injuries are incurred by hospital-based personnel each year in the United States.²² A 2008 survey by the American Nurses Association revealed that 64% of nurse respondents reported having an accidental sharps injury.²³

Sharps include needles and other devices such as scalpels that can result in a percutaneous injury to the person using or handling them. Hepatitis B virus (HBV), hepatitis C virus (HCV), and human immunodeficiency virus (HIV) are well-known pathogens associated with disease transmission from sharps injuries; however, the risk could include more than 20 others.²² In addition to percutaneous injuries, handling blood and body fluids that may be contaminated also presents a risk for occupational disease transmission.

In the 1990s, increased attention to sharps injuries in the health care workforce resulted in legislation, product research and development, implementation of injury surveillance systems and identification of risk mitigation strategies.²⁴ Despite legislation at the national and state level mandating preventive activities, significant risk remains for health care workers and patients. Research continues to show that many bloodborne pathogen exposures could be prevented by compliance with recognized safety strategies.^{23,25–28}

Sharps injuries occur across many professional disciplines and health care settings. Available statistics suggest that nurses and surgeons are at the greatest risk.^{29–31} According to surveillance data from 2008 in Massachusetts, 38% of injuries were incurred by nurses.³⁰ Similarly, data collected by the CDC between 1995 and 1999 also showed that 44% of injuries were incurred by nurses.² During the same reporting periods, physicians incurred 36% and 30% of

injuries respectively. Other health care workers with reported sharps injuries include surgical residents and technicians, medical and nursing students, nursing assistants and orderlies, phlebotomists, and lab workers. When improperly disposed of, sharps can place housekeeping and other support staff at risk as well. To address this issue, multiple legislative guidelines and policies developed between 1987 and 2000 included recommendations relevant to the design and function of safe disposal containers resulting in a marked decline in the percentage of disposal-related sharps injuries.³²

Underreporting is a significant issue across all disciplines and is complicated by many factors including fear, lack of time, punitive outcomes, inadequate reporting and post-exposure protocols, and misperception about the level of risk. Estimates of unreported needlestick injuries range from 30% to 73%.^{33,34}

Sharps injuries can occur in any setting where devices are used. Current surveillance systems receive data almost exclusively from hospitals but could serve as models for injury tracking in other settings, such as long term care, home care, medical clinics, and outpatient centers (e.g., surgical and dialysis).³⁴ Within hospitals, the patient room and surgical units are some of the highest exposure risk locations.²⁹ Introduction of the Needlestick Safety and Prevention Act of 2000 led to a significant overall decrease in sharps injuries in nonsurgical settings; however, there was a noticeable increase in the proportion of injuries connected with the use of safety-engineered devices, implying increased deployment of this technology.²⁸ However, in surgical settings the overall injury rate increased during the same period and the incidence of injuries associated with safety-engineered devices was less than 1%, reflecting minimal use of this technology.²⁸

Sharps injuries present a risk in the home health setting as well. A study to examine sharps injuries in nine home health care agencies from 2006 to 2007 documented an annual injury incidence rate of 5.1 per 100 FTE nurses and 1.0 per 100 FTE aides,³⁵ while two other surveys of home care nurses found 13% (9 of 72 nurses)³⁶ and 8.5% of 164 nurses had experienced a sharps injury in the previous 12 months.³⁷ Additionally, family members and informal caregivers in the home care setting are also at risk.

3.2.1.1 Impact on Patients and Workers

Sharps injuries place the health care worker and patient at risk for exposure to infectious diseases. In addition to percutaneous injury, workers are at risk for mucous membrane

and skin exposures to contaminated blood and body fluids. The actual risk for occupational transmission of pathogens varies for each organism. For example, the average risk for HIV transmission after a percutaneous exposure is estimated to be 0.3%² while HCV ranges from 0.5% to 10% following a single needlestick exposure.³⁸ The advent of the hepatitis B vaccine has resulted in an incidence of HBV in health care workers that is significantly lower than the general population.² Fortunately, occupationally acquired HIV and HCV are rare events; however, exposures still carry the risk of other infections and adverse outcomes.^{2,22,34}

The issue of transmission of infectious diseases from health care workers to patients is an area of increasing interest. Transmission of bloodborne pathogens from health care workers to patients has been primarily reported in cases of infected surgeons performing exposure-prone procedures (orthopedic, for example). In fact, worldwide cases of health care worker-to-patient transmission of HIV between 1991–2005 and HBV between 1991 and 2005 all occurred in surgical settings.³⁹ Under-reporting of exposure incidents may be a factor in determining the impact on patients. Perry et al.³⁹ and others have called for improved national level reporting of patients exposed to health care workers' blood and monitoring of infection rates for those individuals. Somewhat more common, however, is the risk of transmission from a drug-using infected employee to patients. Recent narcotic diversion incidents in which a cardiac catheterization lab technician and a radiology technician were suspected of reusing contaminated syringes resulted in the need for thousands of patients to be tested.^{40,41}

The impact of these injuries is both direct and indirect. Exposed individuals, patients, or workers face possible illness and associated outcomes—both physical and emotional. An exposure may trigger fear and anxiety in the individual and the family as the exposed individual is monitored for possible seroconversion.³⁴ In addition to the potential for adverse health outcomes, injury-related costs may include medical treatment, lost wages, workers' compensation, and legal liability. Lastly, trust between patients, health care workers, and organizations may be diminished.

3.2.1.2 Examples of Interventions

Evidence shows that there are successful strategies and interventions that dramatically reduce the risk of a sharps injury. A range of safety-equipped injection devices have been developed over the past 20 years. Coupled with

ongoing educational efforts, there has been a reduction in injury rates. Frontline staff should be involved in the evaluation and selection of specific products. However, introducing safety devices alone is not enough. When possible, other methods of medication administration should be substituted. Health care organizations should provide administrative structures such as policies and procedures to support the consistent and effective use of selected safety devices.

When working outside of institutional settings and controlled environments, plan ahead prior to performing high risk procedures by establishing adequate work space, device handling and disposal methods, and obtaining safety-engineered devices and patient handling equipment whenever possible. For example, in home health care, devices and equipment design typically varies across patients and may be new or unfamiliar to the nurse. Additionally, patients in the home may reuse equipment or improperly dispose of used equipment, placing health care staff and family members at risk.^{34,35} Safe practice is further complicated by the fact that each home environment is unique and may present unsafe working conditions. Home care nurses report that work settings are sometimes dirty, crowded, and complicated by poor lighting and other distractions.³⁵

Examples of interventions that successfully reduce the risk and incidence of sharps injuries and bloodborne pathogen exposures across health care settings are well documented. Administrative actions include the following:

- Institute a systematic approach to bloodborne pathogen exposure prevention including: employee education programs, policies, and procedures to support injury prevention, reporting, and postexposure protocols.²⁶
- Assess the organization's risks and injury experience through a review of available reports, injury surveillance, and staff survey.⁴²
- Eliminate unnecessary invasive procedures in favor of safer alternatives when appropriate.^{34,42}
- Organize a multidisciplinary quality improvement team, conduct a baseline assessment, set priorities of an action plan, and implement improvement interventions.⁴²
- Assess the impact of prevention activities through feedback, data collection, and analysis, and modify activities as needed.⁴²
- Offer vaccine to persons with the potential for exposure to HBV and other bloodborne pathogens.²
- Provide easy access to efficient systems for postexposure prophylaxis to prevent HIV transmission.³⁵

Examples of behavioral controls include the following:

- Avoid recapping needles using two hands.^{26,42}
- Use safe needle disposal methods and materials.^{34,35,42}
- Use blunt suture needles instead of sharp ones and use safety-engineered instruments when available and feasible.^{25,26,34,42}
- Avoid hand-to-hand passing of instruments in the surgical setting—create neutral zones or designated fields for instrument transfers to avoid simultaneous handling by personnel.^{2,25,26}

3.2.1.2.1 Safe Injection Practices: The CDC’s “One and Only” Campaign

“Preventing the spread of bloodborne pathogens, particularly hepatitis B virus (HBV), hepatitis C virus (HCV), and human immunodeficiency virus (HIV), represents a basic expectation anywhere health care is provided. This is true both in terms of patient and provider protections. Health care should provide no avenue for the transmission of these potentially life-threatening infections; yet, unsafe medical practices continue to contribute to much of the worldwide disease burden that is associated with HBV and HCV.”^{43(p.137)}

The One & Only Campaign is a public health campaign, led by the CDC and the Safe Injection Practices Coalition to raise awareness among patients and health care providers about safe injection practices.⁴⁴ The campaign aims to eradicate outbreaks resulting from unsafe injection practices.

As described by CDC, unsafe injection practices put patients and health care providers at risk of infectious and noninfectious adverse events and have been associated with a wide variety of procedures and settings. Investigations by state and local health departments and the CDC have identified improper use of syringes, needles, and medication vials when administering routine injections.⁴³ These practices have resulted in:

- Transmission of bloodborne viruses, including HCV to patients
- Notification of thousands of patients of possible exposure to bloodborne pathogens and recommendation that they be tested for HCV, HBV, and HIV
- Referral of providers to licensing boards for disciplinary action
- Malpractice suits filed by patients

The campaign, which engages more than 20 public and private organizations, focuses on educating health care providers on the following basic safety messages:

- Do not use needles and syringes for more than one patient or reuse to draw up additional medication.
- Do not administer medications from a single-dose vial or IV bag to multiple patients.
- Limit the use of multidose vials and dedicate them to a single patient whenever possible.

In April 2011, Premier Healthcare Alliance hosted “Safer Designs for Safer Injections: Innovations in Process, Products, and Practices,” a meeting of more than 200 key stakeholders. The goal of the meeting was to advance injection safety by raising awareness and continuing the national dialogue on expanding safer, innovative approaches and product designs to protect patients and prevent infections.⁴⁵ In addition to the need for more educational outreach, participants recognized the continuing pressure for reducing health care costs and recommended greater clinician involvement in purchasing decisions across all delivery settings.

3.2.2 Preventing Transmission of Infectious Diseases

Infectious disease transmission by direct and indirect exposure is perhaps the most visible health risk underscoring the connection between health care personnel and patients. Occupational health and infection preventionists (IPs) have traditionally worked toward shared goals of preventing, tracking, recording, and reporting (where indicated) the occurrence of infectious diseases in health care organizations. Epidemics, especially recent influenza outbreaks, have increasingly drawn these professionals together across health care organizations and settings. In fact, in a few organizations, these roles may even be combined, making a strong case example for the synergy between health care worker and patient health interventions. The increasing complexity of the health care environment has expanded the scope of work for IPs to include oversight of employee health services related to infection prevention.⁴⁶ However, significant opportunities exist to enhance collaboration in preventing infection among health care workers, patients, and the community at large. An in-depth discussion of infection prevention and control is beyond the scope of this monograph. However, this section will draw attention to recognizing the shared goals and interventions that protect employees and patients from disease transmission and infection.

Resources 3-3: Sharps Injuries

Title and Website	Description
American Nurses Association (ANA)	
Needle Safety http://www.needlestick.org	Brochures, fact sheets, CE module, and toolkits for nurses and employers
Massachusetts Department of Health and Human Services	
The Massachusetts Sharps Injury Surveillance and Prevention Project http://www.mass.gov/dph/ohsp	State mandated reporting system for sharps injuries among hospital workers
National Institute for Occupational Safety and Health (NIOSH)	
Bloodborne Infectious Diseases: HIV/AIDS, Hepatitis B, Hepatitis C: Preventing Needlesticks and Sharps Injuries http://www.cdc.gov/niosh/topics/bbp/sharps.html	Multiple and diverse online resources and links to alerts, publications, workbooks, surveillance data, educational/training materials, and case studies
NIOSH Alert Preventing Needlestick Injuries in Health Care Settings. DHHS (NIOSH) Publication No. 2000-108 http://www.cdc.gov/niosh/docs/2000-108/	NIOSH Alert providing recommendations and references for employers and workers related to preventing needlestick injuries
Bulletin Use of Blunt-Tip Suture Needles to Decrease Percutaneous Injuries to Surgical Personnel: Safety and Health Information Bulletin DHHS (NIOSH) Publication No. 2008-101 http://www.cdc.gov/niosh/docs/2008-101/	The bulletin is advisory in nature, informational in content, and is intended to assist employers in providing a safe and healthful workplace. The purpose is (1) to describe the hazard of sharp-tip suture needles as a source of percutaneous injuries to surgical personnel; (2) to present evidence of the effectiveness of blunt-tip suture needles in decreasing percutaneous injuries to surgical personnel, particularly when used to suture muscle and fascia; and (3) to emphasize OSHA's requirement and NIOSH's recommendation to use safer medical devices—in this case, blunt-tip suture needles—where clinically appropriate.
Workbook for Designing, Implementing, and Evaluating a Sharps Injury Prevention Program http://www.cdc.gov/niosh/topics/bbp/sharps.html	A workbook designed for infection preventionists, occupational health personnel, health care administrators, and others to help prevent needlesticks and other sharps-related injuries to health care personnel
STOP STICKS Campaign Sharps Injuries—Bloodborne Pathogens http://www.cdc.gov/niosh/stopsticks/bloodborne.html	This webpage by NIOSH's "Stop Sticks" campaign raises awareness of the various types of diseases that can be potentially transmitted through needlestick injuries.
University of Virginia Health System	
EPINet, International Health Care Worker Safety Center, University of Virginia http://www.healthsystem.virginia.edu/pub/epinet	Information and resources relating to percutaneous injury, including reports on data from the EPINet surveillance system

A consensus panel,⁴⁷ convened to develop recommendations for the infrastructure and essential activities for infection control in hospitals, identified the following goals of an infection control and prevention program:

- Protect the patient.
- Protect the health care worker, visitors, and others in the health care environment.
- Accomplish the previous two goals in a cost-effective manner, whenever possible.

These goals can be applied in any setting where patients and health care workers interact. Preventing the transmission of disease to individuals requires attention to the various modes of transmission. These modes include contact (direct and indirect), droplet, and airborne.

Infection control guidelines recommend implementation of infection control practices that have shown to decrease the transmission of infectious agents. However, several observational studies have revealed that adherence to these recommendations by health care personnel ranges from 43% to 89%, depending on the circumstance in which they were used (for example, 92% adherence to glove use during arterial blood gas collection).⁴⁶ The CDC *Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Health Care Settings*⁴⁶ has noted that health care workers often perceive their compliance to be higher than actual observed performance. Traditional interventions that are used to increase compliance, such as education, enhance knowledge levels but may not change behaviors. Multifaceted approaches that combine new elements, such as engineering controls, facility design concepts, or the use of electronic monitoring and voice prompts for hand hygiene, are being explored.⁴⁶

One of the most significant infection control concerns is the risk of patients developing an infection while in a health care organization. Infections unrelated to the condition for which patients are being treated in a health care facility are often referred to as healthcare associated—infections (HAIs). HAIs are sometimes linked to the use of devices as in catheter-associated urinary tract infections (CAUTI) and central line-associated blood stream infections (CLABSI). Other infections are associated with drug resistant organisms known to be present in health care facilities, such as methicillin-resistant *Staphylococcus aureus* (MRSA). MRSA is one example of several bacteria that have become resistant to one or more class of antimicrobial agents and as a group are identified as multidrug-

resistant organisms (MDROs). A study of patients in 2002 estimated that HAIs accounted for an estimated 1.7 million infections.⁴⁸

Infections in nursing home residents are estimated to result in 150,000 to 200,000 hospital admissions per year, and when infection is the primary admitting diagnosis, the death rate can reach as high as 40%.⁴⁹ It is further estimated that nursing home residents incur an average of 1.6 to 3.8 infections annually.⁴⁹ Efforts to prevent and reduce HAIs have received extensive attention from regulatory, public health, and professional organizations as well as the media and watchdog groups. These efforts have become a national priority. Additional information on initiatives may be found at <http://www.hhs.gov/ash/initiatives/hai/infection.html>.⁵⁰

Some infections (for example, drug-resistant tuberculosis) may be more prevalent in particular geographic locations or certain populations outside the acute care setting. However, in a world that can be traversed in mere hours, safety is not guaranteed by distance, further highlighting the importance of taking a comprehensive view toward prevention.⁵¹ The Severe Acute Respiratory Syndrome (SARS) epidemic in 2003 was a wake-up call to the risks for workers and patients, and further highlighted the need for effective safety systems in health care.⁵² This infection first occurred in southern China and rapidly spread throughout the world, eventually resulting in 774 deaths;⁵³ 51% of the deaths in a Canadian outbreak were health care workers.⁵⁴ Annual seasonal influenza outbreaks along with newer and more virulent flu strains, as well as fears of a pandemic outbreak, make this a critical issue that requires collaborative occupational and patient health initiatives at the organizational level and as part of the larger infection control community.

Infection is also a significant concern voiced by health care professionals. A survey of Association of Occupational Health Professionals members conducted in August 2010 found infection was one of the top issues or concerns.⁵⁵ Many concerns are related to sharps injuries and subsequent exposures (see Section 3.2.1 Sharps Injuries and Bloodborne Pathogen Exposures, page 78). However, other infections and modes of transmission also pose risks to health care workers. For example, the recent surge of measles outbreaks includes documented transmission of infection from patients to health care workers.⁵⁶

Influenza transmission between health care workers and patients is an ongoing issue, and although the CDC has recommended since 1984 that all health care workers be immunized, estimates are that 30–50% of workers in health care organizations are unvaccinated.⁵⁷ Health care workers are at greater risk for contracting influenza than are members of the general public, and the aging workforce places many workers in higher risk categories. The CDC has proposed a goal of 90% coverage to be included in the Healthy People 2020 for health care personnel influenza vaccination.⁵⁸ Also, The Joint Commission has updated the standards addressing health care worker influenza vaccination and expanded the settings for which they apply. The new standards became effective July 1, 2012.⁵⁹

While frontline health care workers usually come to mind first when considering infectious disease exposure and transmission, all employees in the health care environment must be included in prevention planning. For example, organizations must pay attention to risks of transmission in food safety, waste disposal, lab and diagnostic services, and environmental cleaning. Similarly, health care workers and patients in all settings are at risk for infection transmission. Inpatient acute care settings administer to the sickest and most vulnerable patients and often involve treatment of the most serious infectious organisms. However, any setting in which people interact, such as physicians' offices, outpatient clinics, inpatient settings, long term care facilities, and patient homes pose a risk for disease transmission. Noninstitutional settings, such as home health, also lack the environmental and engineering controls available in facilities that enhance efforts to prevent infection transmission.

3.2.2.1 Impact on Patients and Workers

The impact of infections on patients and health care workers is significant. Patients who develop HAIs can experience a range of serious complications that in some instances includes the risk of death. For example, influenza can lead to the development of pneumonia and complicate existing cardiopulmonary conditions.⁵⁷ As many as 90% of all influenza-related deaths occur among elderly patients. In addition to morbidity, HAIs increase length of stay and significantly increase the costs of care. Patient and family perceptions of and satisfaction with care are likely to be diminished.

Health care workers who develop occupationally acquired infections not only experience personal illness but risk exposing family members. Employee absenteeism adds costs to the organization (to replace the ill employee) and increases health insurance expenditures. Protecting the health of patients and workers from infectious diseases is a hallmark of a safe workplace. Calculating the cost-benefit ratio of utilizing specific prevention strategies and interventions is challenging. However, successful prevention of disease transmission between health care workers and patients leads to important cost savings for the organization and health care insurer.⁴⁷

3.2.2.2 Examples of Interventions

Infection prevention and control is a vast topic for which extensive evidence and many practice guidelines are available. Government public health and professional associations are rich resources for information (see Resources 3-4, page 86). An organizational safety culture with a shared commitment to infection prevention for the safety of patients and workers is created through (1) the actions management takes to improve patient and worker safety, (2) worker participation in safety planning, (3) the availability of appropriate protective equipment, (4) influence of group norms regarding acceptable safety practices, and (5) the organization's socialization process for new personnel.⁴⁶

Interventions to prevent transmission of infectious diseases are often identified within the hierarchy of controls (see page 34). Administrative controls are directed at the early detection of infectious diseases in workers or patients and include screening mechanisms (such as medical histories), testing (such as a TB skin test), and policies and procedures detailing referral and treatment protocols. Examples of engineering controls include special building design (for example, isolation rooms) and mechanical systems such as high-efficiency particulate air (HEPA) filters and ventilation systems.⁶ Personal protective equipment (PPE) is sometimes the most practical means of preventing infectious disease transmission.

The CDC guideline⁴⁶ states that the use of standard precautions is based on the principle that all blood, body fluids, secretions, excretions (except sweat), nonintact skin, and mucous membranes may contain transmissible infectious agents. These precautions include infection prevention practices that apply to all patients and all settings in which health care is delivered. Prevention practices

include hand hygiene; use of gloves, gown, respirators, masks, eye protection, or face shield, depending on the anticipated exposure; and safe injection practices.

Hand hygiene is often noted as the most important practice to reduce the transmission of infectious agents in health care settings as well as being an essential component of standard precautions.⁴⁶ Hand hygiene includes both hand-washing with either plain or antiseptic-containing soap and water, and the use of alcohol-based products (gels, rinses, foams) that do not require the use of water.⁴⁶ Hand hygiene is a critical activity for health care personnel, but it is also important for patients and visitors. Extensive information on hand hygiene, including resources and tools, is provided in the publication *Measuring Hand Hygiene Adherence: Overcoming the Challenges* (see Resources 3-4, page 87).

Using physical barriers and PPE protects workers and patients from exposure and possible disease transmission. Examples of PPE as mentioned previously include gowns, respirators, goggles, masks, and face shields. Recommendations for the application of standard precautions for the care of all patients in all health care settings is provided in Table 3-3, page 85. An interactive web-based educational program designed to promote safer and more healthful hospitals by reducing occupational transmission of infectious disease is available at <http://innovation.ghrp.ubc.ca/ProtectPatti/eng/>.⁶⁰ A robust infection prevention and control program is built on coordination between occupational and infection preventionists and deploys multiple strategies within a hierarchy of controls.

3.3 Exposure to Hazardous Substances

3.3.1 Hazardous Drugs, Chemicals, and Other Substances

By their nature, many treatment and diagnostic modalities used in the health care setting place workers and others at risk for unintended exposure to hazardous substances. Medical interventions ranging from treatments involving antineoplastic agents to radiographic diagnostics can place staff and patients at risk for potential adverse health outcomes. One of the most significant risks involves hazardous drugs, identified by the NIOSH as including drugs used for cancer chemotherapy, antiviral drugs, hormones, some bio-engineered drugs, and other miscellaneous drugs.⁶¹ In addition to antineoplastic drugs employed in patient treatment,

radiation used in diagnostic imaging and therapies may expose the patient, health care workers, and others to serious harm.^{62,63}

A variety of other physical and chemical agents used in the health care facility, such as cleaning products, disinfectants, sterilants, and anesthetic gases may also pose a health hazard. For example, the use of bleach is increasing to prevent *Clostridium difficile* infections; however, adverse reactions have been reported among cleaning service workers.⁶⁴ When present, hazardous materials can potentially expose patients and health care workers to harm; therefore, this issue benefits from a unified safety effort. The scope of this monograph precludes addressing all of the potential hazardous substances used in health care. For additional information, readers are referred to Chapter 15 of the NIOSH State of the Sector document (Chemicals and Other Hazardous Exposures).² Two examples of hazardous substances found in health care presented in this discussion are chemotherapeutic drugs and exposure to medical radiation.

One of the first uses of a hazardous chemical for therapeutic purposes occurred after nitrogen mustard, a chemical weapon used in World War I, was observed to cause bone marrow and lymph tissue regression in exposed soldiers.⁶⁵ Nitrogen mustard was then used as a treatment for lymphoid malignancies in what many consider to be the first instance of cancer chemotherapy. This was followed by the development of a family of drugs used for the treatment of cancers. Hazardous drugs also include those used in HIV therapy and antiviral agents. These drugs have been shown in studies with humans and animals to have a “potential for causing cancer, reproductive toxicity, birth defects, or acute harm to health.”⁶⁶ NIOSH has developed and maintained a *List of Antineoplastic and Other Hazardous Drugs in Healthcare Settings* that is available at <http://www.cdc.gov/niosh/docs/2012-150/pdfs/2012-150.pdf>.⁶⁷ In April 2011, a letter jointly authored by OSHA, The Joint Commission, and NIOSH informed health care organizations of recent updates to the list and the need for health care organization leadership to ensure that hazardous drug and safe handling policies were in place.⁶⁸

The methods of exposure may include inhalation, skin contact, skin absorption, ingestion (from hand to mouth), and injection (needlestick or sharps injury). In 1986, following early inquiries, OSHA published guidelines for the management of antineoplastic drugs in the workplace.⁶ The guidelines have been followed by additional guidelines, standards,

Table 3-3: Recommendations for the Application of Standard Precautions for the Care of All Patients in All Health Care Settings

COMPONENT	RECOMMENDATIONS
Hand hygiene	After touching blood, body fluids, secretions, excretions, contaminated items; immediately after removing gloves; between patient contacts
Personal Protective Equipment (PPE)	
Gloves	For touching blood, body fluids, secretions, excretions, contaminated items; for touching mucous membranes and nonintact skin
Gown	During procedures and patient-care activities when contact of clothing/exposed skin with blood/body fluids, secretions, and excretions is anticipated
Mask, eye protection (goggles), face shield*	During procedures and patient-care activities likely to generate splashes or sprays of blood, body fluids, secretions—especially suctioning, endotracheal intubation
Soiled patient-care equipment	Handle in a manner that prevents transfer of microorganisms to others and to the environment; wear gloves if visibly contaminated; perform hand hygiene
Environmental control	Develop procedures for routine care, cleaning, and disinfection of environmental surfaces, especially frequently touched surfaces in patient-care areas
Textiles and laundry	Handle in a manner that prevents transfer of microorganisms to others and to the environment
Needles and other sharps	Do not recap, bend, break, or hand-manipulate used needles; if recapping is required, use a one-handed scoop technique only; use safety features when available; place used sharps in puncture-resistant container
Patient resuscitation	Use mouthpiece, resuscitation bag, other ventilation devices to prevent contact with mouth and oral secretions
Patient placement	Prioritize for single-patient room if patient is at increased risk of transmission, is likely to contaminate the environment, does not maintain appropriate hygiene, or is at increased risk of acquiring infection or developing adverse outcome following infection
Respiratory hygiene/cough etiquette (source containment of infectious respiratory secretions in symptomatic patients, beginning at initial point of encounter, for example, triage and reception areas in emergency departments and physician offices)	Instruct symptomatic persons to cover mouth/nose when sneezing/coughing; use tissues and dispose in no-touch receptacle; observe hand hygiene after soiling of hands with respiratory secretions; wear surgical mask if tolerated or maintain spatial separation greater than 3 feet if possible

* During aerosol-generating procedures on patients with suspected or proven infections transmitted by respiratory aerosols (such as SARS), wear a fit-tested N95 or higher respirator in addition to gloves, gown, and face/eye protection.

Source: Siegel JD, Rhinehart E, Jackson M, Chiarello L. Health Care Infection Control Practices Advisory Committee. 2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Health Care Settings. *Am J Infect Control*. 2007 Dec;35(10 Suppl 2):S65–164. PubMed PMID: 18068815.

Resources 3-4: Prevent Infection Transmission

Title and Website	Description
Agency for Healthcare Research and Quality (AHRQ)	
Toolkit AHRQ Quality Indicators™ Toolkit for Hospitals. Improving Performance on the AHRQ Quality Indicators http://www.ahrq.gov/qual/qitoolkit/d7_implementationmeasurement.docx	The toolkit is designed to help your hospital understand the Quality Indicators (QIs) from the Agency for Healthcare Research and Quality (AHRQ) and support your use of them to successfully improve quality and patient safety. It includes a section on infection prevention.
Association for Professionals in Infection Control and Epidemiology (APIC)	
Practice Resources http://www.apic.org/Professional-Practice/Practice-Resources	This link directs the reader to APIC's Professional Practice Resources Page.
Centers for Disease Control and Prevention (CDC)	
Guidelines 2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings http://www.cdc.gov/hicpac/pdf/isolation/isolation2007.pdf	This guideline updates and expands the 1996 Guideline for Isolation Precautions in Hospitals. Intended for use by infection control staff, health care epidemiologists, health care administrators, nurses, other health care providers, and persons responsible for developing, implementing, and evaluating infection control programs for health care settings across the continuum of care. The reader is referred to other guidelines and websites for more detailed information and for recommendations concerning specialized infection control problems.
Information on HAI Topics Healthcare–Associated Infections (HAIs) http://www.cdc.gov/hai/	This site directs the reader to information on multiple topics including incidence, organisms, prevention, and research.
Tools Personal Protective Equipment http://cdc.gov/HAI/prevent/ppe.html	Tools related to use of PPE for protecting health care personnel and patients from exposure to microbiological hazards include videos, slides, and posters.
Institute for Healthcare Improvement (IHI)	
Improvement Map http://app.ihl.org/imap/tool/	This website provides a customized collection of processes to guide improvement efforts in preventing HAIs.
Joint Occupational Health & Safety Committee (Canadian Centre for Occupational Health & Safety)	
Resource Tool Protect Patti http://innovation.ghrp.ubc.ca/ProtectPatti/eng/	This website, developed by the University of British Columbia, includes an interactive learning tool to promote safer and more healthful hospitals by reducing occupational transmission of infectious diseases.

Resources 3-4: Prevent Infection Transmission (continued)

Title and Website	Description
National Quality Forum (NQF) Report Safe Practices for Better Healthcare 2010 Update: A Consensus Report. Abridged report. Washington, DC 2010 (accessed 11/21/11) http://www.qualityforum.org/Publications/2010/04/Safe_Practices_for_Better_Healthcare_%e2%80%93_2010_Update.aspx	This is a report comprising 34 practices that have been demonstrated to be effective in reducing the occurrence of adverse health care events. Chapter 7 is focused on the prevention of HAIs.
Occupational Safety and Health Administration (OSHA) Standards Related to Healthcare http://www.osha.gov/SLTC/healthcarefacilities/standards.html	This link provides OSHA standards, directives, and standard interpretations related to health care.
Society for Healthcare Epidemiology of America (SHEA) Guidelines A Compendium of Strategies to Prevent Healthcare-Associated Infections in Acute Care Hospitals http://www.shea-online.org/GuidelinesResources/CompendiumofStrategiestoPreventHAIs.aspx	This document presents a summary of the guidelines to prevent HAIs in acute care hospitals. Also presented are practical recommendations in a concise format designed to assist acute care hospitals in implementing and prioritizing their HAI prevention efforts. Four device and procedure-associated HAI categories are targeted as well as two organism-specific HAI categories.
The Joint Commission Monograph Measuring Hand Hygiene Adherence: Overcoming the Challenges http://www.jointcommission.org/Measuring_Hand_Hygiene_Adherence_Overcoming_the_Challenges/ Monograph Providing a Safer Environment for Health Care Personnel and Patients through Influenza Vaccination http://www.jointcommission.org/Providing_a_Safer_Environment/ Monograph Preventing Central Line–Associated Infections: A Global Challenge, A Global Perspective http://www.jointcommission.org/preventing_clabsi/	This monograph provides a framework to help health care workers make necessary decisions about what, when, why, and how they will measure hand hygiene performance. It includes examples of tools and resources to help organizations select the measurement approaches that best fit their needs. This monograph provides information to help health care organizations of all types improve seasonal influenza vaccination rates in health care personnel. This monograph contains the most current information, evidence-based guidance, and resources to assist healthcare organizations in reducing central line–associated bloodstream infections (CLABSIs).

Resources 3-4: Prevent Infection Transmission (continued)

Title and Website	Description
The Joint Commission [continued]	
Monograph Tdap Vaccination Strategies for Adolescents and Adults, Including Health Care Personnel: Strategies from Research and Practice http://www.jointcommission.org/tdap/	This monograph incorporates evidence-based guidelines and published literature to highlight practical strategies to improve Tdap (tetanus, diphtheria, and pertussis) vaccination rates. Additionally, the monograph includes examples of vaccination initiatives that organizations have used to establish or enhance Tdap vaccination programs.
R ³ Report, Issue 3: Requirement, Rationale, Reference Influenza vaccination for licensed independent practitioners and staff http://www.jointcommission.org/assets/1/18/R3_Report_Issue_3_5_18_12_final.pdf	R ³ Report provides the rationale and references that The Joint Commission employs in the development of new requirements. While the standards manuals also provide a rationale, the rationale provided in R ³ Report goes into more depth.

and recommendations (see Resources 3-5, page 92, for examples). Health care workers at particular risk for adverse outcomes from exposure include pharmacists, pharmacy technicians, nursing personnel, physicians, operating room staff, and auxiliary staff in shipping/receiving, waste handlers, and maintenance workers.⁶ Because contamination of work surfaces from these drugs has been found in patient treatment areas,^{2,61} family members and caregivers are potentially at risk for second-hand exposure.⁶⁹ Although administration of these drugs initially was always performed in the hospital, many treatments are now performed in the outpatient setting. For example, data from 2007 shows that of the approximately 23 million annual adult patient visits for chemotherapy, 19 million (84%) were conducted in ambulatory care settings.⁷⁰ Across all settings, there is no consistent regulatory framework or mandatory, standardized requirements for risk-mitigation interventions. Current regulations covering hazardous drugs involve multiple agencies, such as OSHA, the Department of Transportation, and the Environmental Protection Agency. Recommendations and guidelines for working with hazardous drugs have been developed by federal agencies and professional societies.^{61,71-73}

3.3.1.1 Impact on Patients and Workers

In the United States an estimated 8 million health care workers are involved in some part of the process of hazardous drug preparation, administration, or disposal, thereby risking exposure.⁷⁴ Reports of symptoms following occupational exposure to hazardous drugs include immedi-

ate nervous system effects, skin rashes, sore throat, dizziness, headache, allergic reaction, diarrhea, nausea, and vomiting.^{70,73} Cancer and adverse reproductive outcomes, such as birth defects, low birth weight, fetal loss, and infertility, have been found in studies of exposed workers.⁷⁵⁻⁷⁷ A recent study of 7,500 nurses who had a pregnancy between 1993 and 2002 found that about 2 out of 10 nurses who had handled chemotherapy drugs for more than an hour a day had a miscarriage compared to 1 in 10 overall.⁷⁸ Multiple factors influence occupational exposures, including the following:⁶¹

- Drug handling circumstances (compounding, administration, or disposal)
- Amount of drug prepared
- Frequency and duration of drug handling
- Potential for absorption
- Use of biological safety cabinets or other ventilated cabinets
- Use and adequacy of PPE
- Work practices

Although the toxic effects of hazardous drugs used in various medical therapies are also observed in patients receiving them, the potential therapeutic benefits outweigh the risks of side effects.²

3.3.1.2 Safe Drug Handling Examples

Organizations are encouraged to develop a comprehensive safe handling program for hazardous drugs. A listing of the

NIOSH recommendations for safe handling of antineoplastic and other hazardous drugs is provided in Table 3-4.

Some examples of interventions to promote safe drug handling are shown in Sidebar 3-3, page 91.

3.3.1.3 Safe Disposal of Hazardous Drugs or Waste

Care should also be taken when handling waste resulting from hazardous drug preparation or administration. All materials that come into contact with hazardous drugs or waste from patients receiving therapy with hazardous drugs (antineoplastics, radionuclides, etc.) can potentially contain hazardous materials or their metabolites. They should be treated as hazardous and should be handled in the same manner as the parent material. Personnel collecting and transporting these materials should take the appropriate precautions, such as wearing the recommended PPE and following the institution's protocols. In addition, each facility or institution should develop a policy for separation and safe disposal of hazardous drug material. The NIOSH Alert (see Resources 3-5, pages 92–93) also provides specific tips regarding hazardous drug waste disposal.⁶¹

3.3.1.4 Survey of Health Care Worker Extent and Exposure to Hazardous Chemical Agents

Results from a recently completed NIOSH Health and Safety Practices Survey of Healthcare Workers promise to provide important new information about health care workers' work experiences concerning use of hazardous chemicals.⁷⁹ Twenty-one professional health care organizations partnered with NIOSH and invited their members to participate in the voluntary web-based survey. The purpose of the survey was to better understand the extent and circumstances of exposure to antineoplastic agents, anesthetic gases, surgical smoke, high-level disinfectants, chemical sterilants, and aerosolized medications. Information on the use of exposure controls (and barriers to their use, if not used) was also collected. Results are expected to be published in early 2013.

3.3.2 Radiation

Radiation is used in health care for diagnostic and therapeutic purposes. X-rays are officially classified as a carcinogen by WHO's International Agency for Research on Cancer, the CDC's Agency for Toxic Substances and Disease Registry, and by the NIH National Institute of Environmental Health Sciences.⁶² Identified risks related to radiation exposure include burns, cancer, and other

injuries.⁶² Like the drugs used in chemotherapy, radiation places health care workers at risk for unintentional exposure, whereas patients are at potential risk for adverse outcomes related to dosage and frequency of exposure. New technology has increased the availability and utilization of medical imaging procedures, some of which require the clinician to maintain close physical contact with the patient during radiation exposure.⁸⁰ Increased use of diagnostic imaging in the past two decades has almost doubled the total exposure to ionizing radiation in the US population.⁶² Dental radiography also exposes patients and staff to low-dose ionizing radiation, which may be associated with increased risk for thyroid cancer, particularly with multiple exposures.⁸¹

Findings of a recent congressional analysis reported in the media found that patients with cancer and other diseases who are being treated with radioactive materials, such as radioactive iodide, can now choose to be released from the hospital to their home or a hotel for recovery, potentially exposing family and others to radiation.⁸² Members of the population at greatest risk of harm from exposure are pregnant women and young children. Contamination of the patient's environment can include bedding, personal laundry, room surfaces, and so on. Currently, regulations in the United States allow patients treated with radioisotopes to be sent home, in contrast to other countries where hospitalization is required for treatment.⁸² Protecting those individuals around the patient depends heavily on educating the patient and family on risk precautions and limiting exposure to vulnerable individuals.

3.3.2.1 Impact on Staff and Patients

Data gathered from studies of health care workers exposed to radiation prior to 1950 show excess risk of leukemia, skin cancer, and female breast cancer.⁶³ The introduction of risk-mitigation procedures, such as lead aprons, increased worker and patient safety. However, as noted previously, the development of new and complex imaging technologies combined with the increased utilization of medical imaging requires new epidemiological studies to evaluate the impact on patients and workers. While safety guidelines and federal regulations require dose exposure monitoring for some health care personnel working with radiation technologies,⁸³ more study is needed on the average annual, time-trend, and organ doses from occupational radiation exposures, as well as assessment of lifetime cancer risks for these workers.⁶³

Researchers have studied patient risk for development of cancer due to diagnostic radiation exposure. For example, one study estimated that 29,000 future cancers could

Table 3-4: NIOSH Recommendations for Safe Handling of Antineoplastic and Other Hazardous Drugs

Activity	Recommendations
Receiving and storage of drugs	Wear Personal Protective Equipment (PPE) suitable for task being performed Properly label all hazardous drugs Store and transport drugs in proper containers
Preparation and administration of drugs	Evaluate drug preparation and administration policies Wear suitable PPE, including double gloves for task being performed Limit access to areas where drugs are prepared Use proper engineering controls when preparing drugs Wash hands with soap and water before donning and after removing gloves Prime intravenous tubing in a ventilated cabinet Use needleless or closed systems when preparing and administering drugs Do not disconnect tubing from an intravenous bag containing a hazardous drug Dispose of used materials in the appropriate container
Ventilated cabinets	Perform all preparations with hazardous drugs in a ventilated cabinet designed to reduce worker exposure Do not use supplemental engineering controls as a substitute for a ventilated cabinet When asepsis is required, select a cabinet designed for both hazardous drugs containment and aseptic processing Horizontal laminar-flow clean benches should not be used for preparation of hazardous drugs Properly maintain engineering controls as required by the manufacturer
Routine cleaning, decontamination, housekeeping, and waste disposal	Use suitable PPE for the task being performed Establish periodic cleaning routines for all work surfaces and equipment used where hazardous drugs are prepared or administered Consider used linen and patient waste to be contaminated with the drugs and/or their metabolites Separate wastes according to institutional, state, and federal guidelines and regulations
Spill control	Manage spills according to written policies and procedures Locate spill kits in areas where exposures may occur Adhere to OSHA respiratory protection program Dispose of spill material in a hazardous chemical container
Medical surveillance	Participate in medical surveillance programs at work, or see your private health care provider if one does not exist Medical surveillance should include the following: • Reproductive and general health questionnaires • Complete blood count and urinalysis • Physical examination at time of employment and periodic health status questionnaire review • Follow-up for workers who have shown health changes

Adapted from source: Connor TH, McDiarmid MA. Preventing occupational exposures to antineoplastic drugs in health care settings. CA Cancer J Clin. 2006 Nov-Dec;56(6):354-65. Review. PubMed PMID: 17135692.

develop from the 72 million computerized tomography (CT) scans performed in 2007 in the United States.⁸⁴ The patients at higher risk for harm from diagnostic radiation include pregnant women, children, young adults, and individuals with increased sensitivity due to metabolic conditions (for example, diabetes mellitus, hyperthyroidism).⁶² As

with health care workers, the cumulative effect and dosage exposures impact the risk for each patient.

3.3.2.2 Examples of Interventions

The Image Gently program developed by the Society of Pediatric Radiology targets safe imaging guidelines for

Sidebar 3-3: Examples of Interventions to Promote Safe Drug Handling

Administration – Management – Leadership

- Resources (financial and human) to implement a comprehensive safe handling program.*
- Initial and periodic training.†
- Policies and procedures that address areas such as the following: storage, preparation, administration, and disposal of drugs; prohibition of food and beverages in preparation areas; use of PPE; hazardous-spill management and cleanup; and workers' hazardous drug handling during pregnancy or breast feeding.††
- Identification/communication of hazardous drugs used and updates as new drugs are added (maintain a list of drugs or electronically tag hazardous drugs in facility records systems, signage).*†
- Limit employee access to preparation areas to those involved in drug preparation.†

Engineering – Equipment – Environment

- Use of biological safety cabinets (BSC) or compounding aseptic containment isolators (CACI) and approved ventilation for preparation areas.*†§||
- Use of closed-system drug transfer devices.†
- Use of closed IV systems/needleless systems.†#
- Use of PPE (gowns, respirators, gloves).†§
- Favorable practice environment (physical layout and design of workspace).†§||
- Proper use and maintenance of equipment.†||
- Storage of hazardous drugs separate from other drugs in areas with adequate ventilation to dilute and remove any airborne contaminants.†
- Environmental services management of waste, housekeeping, laundry.†||

Behaviors – Health Care Workers – Patients – Others

- Medical surveillance of all workers at risk of exposure to hazardous drugs.†||**††
 - Physical examination at time of hire and repeated as needed.†||††
 - Initial laboratory tests such as a complete blood count.†||††

- Employee completion of health questionnaires at time of hire and periodically thereafter.† ††
- Participate in training on handling hazardous drugs and updates as new information becomes available.†||
- Consistent use of recommended PPE.†§††
- Washing hands after drug-handling activities and removal of PPE.†§||
- Adherence to guidelines for handling hazardous drugs.†§
- Adherence to policies and procedures for handling hazardous drugs.†

References:

- * Massoomi FF, Neff B, Pick A, Danekas P. Implementation of a safety program for handling hazardous drugs in a community hospital. *Am J Health Syst Pharm*. 2008 May 1;65(9):861-865.
- † Department of Health and Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health [Internet]. Cincinnati (OH): Department of Health and Human Services; [updated 2004 Sep; cited 2011 Aug 19]. Preventing Occupational Exposure to Antineoplastic and Other Hazardous Drugs in Health Care Settings; [about 58 p.]. Available from: <http://www.cdc.gov/niosh/docs/2004-165/>.
- ‡ Polovich M. Safe handling of hazardous drugs. *Online J Issues Nurs*. 2004 Sep 30;9(3):6. Review. PubMed PMID: 15482092.
- § US Pharmacopeial Convention [2008]. Pharmaceutical compounding sterile preparations. Chapter <797>. 31st ed. Rockville, MD: United States Pharmacopeial Convention.
- || OSHA Technical Manual; Section VI, Chapter 2: Controlling Occupational Exposure to Hazardous Drugs [OSHA 1999].
- # American Society of Health-System Pharmacists (ASHP). ASHP Guidelines on Handling Hazardous Drugs: *Am J of Health-Syst Pharm*. 2006; 63:1172–1193.
- ** ONS 2011: Polovich M, Bolton DL, Eisenberg S, Glynn-Tucker EM, Howard-Ruben J, McDiarmid MA, Power LA, Smith CA. Safe handling of hazardous drugs. *Oncol Nurs Society*. Second Edition. February 2011.
- †† Department of Health and Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health [Internet]. Cincinnati (OH): Department of Health and Human Services; c2007 [cited 2011 Oct 11; updated 2007 Apr]. Workplace Solutions: Medical Surveillance for Health Care Workers Exposed to Hazardous Drugs, DHHS (NIOSH) Publication Number 2007-117; [about 4 p.]. Available from: <http://www.cdc.gov/niosh/docs/wp-solutions/2007-117/>.

Resources 3-5: Hazardous Drugs and Substances

Title and Website	Description
American Society of Health System Pharmacists (ASHP)	
Case Study Implementation of a safety program for handling hazardous drugs in a community hospital http://www.ashp.org/DocLibrary/Policy/compounding/HD_Masoomi.aspx	A case study of a community hospital safe drug-handling program
Guidelines on Handling Hazardous Drugs http://www.ashp.org/DocLibrary/BestPractices/PrepGdlHazDrugs.aspx	The American Society of Health-System Pharmacists (ASHP) is the membership organization that works on behalf of pharmacists who practice in hospitals and health systems The primary goal of this document is to provide recommendations for the safe handling of hazardous drugs
National Institute for Occupational Safety and Health (NIOSH)	
Website Hazardous Drug Exposures in Health Care http://www.cdc.gov/niosh/topics/hazdrug/	Information on identifying hazards, determining appropriate controls, and applying safe practices regarding hazardous materials in health care settings
Publication NIOSH Alert: Preventing Occupational Exposure to Antineoplastic and Other Hazardous Drugs in Health Care Settings http://www.cdc.gov/niosh/docs/2004-165/	Alert to increase awareness among health care workers and their employers about the health risks posed by working with hazardous drugs and to provide them with measures for protecting their health
Publication Medical Surveillance for Health Care Workers Exposed to Hazardous Drugs http://www.cdc.gov/niosh/topics/hazdrug/	Description of a medical surveillance program as part of an organizational effort to minimize workplace exposure to hazardous drugs; to be updated in late 2012
Publication Personal Protective Equipment for Health Care Workers Who Work with Hazardous Drugs http://www.cdc.gov/niosh/docs/wp-solutions/2009-106/	NIOSH PPE recommendations for workers who handle hazardous drugs in the workplace
Report McDiarmid MA and Leone M. Chapter 14: Hazardous Drugs In: US Department of Health and Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health [Internet]. State of the Sector Healthcare and Social Assistance: Identification of Research Opportunities for the Next Decade of NORA. DHHS (NIOSH) Publication Number 2009-139. Available from: http://www.cdc.gov/niosh/docs/2009-139	This 236 page document, developed by the NORA Healthcare and Social Assistance Sector Council, addresses the "state of the sector," including magnitude and consequences of known and emerging health and safety problems, critical research gaps, and research needs that should be addressed over the next decade of NORA. Chapter 14 discusses hazardous drugs.

Resources 3-5: Hazardous Drugs and Substances (continued)

Title and Website	Description
National Institute for Occupational Safety and Health (NIOSH) [continued]	
Listing NIOSH List of Antineoplastic and Other Hazardous Drugs in Healthcare Settings 2010 http://www.cdc.gov/niosh/docs/2010-167/	Updates the list of antineoplastic and other hazardous drugs in earlier document, National Institute for Occupational Safety and Health NIOSH Alert: Preventing Occupational Exposures to Antineoplastic and Other Hazardous Drugs in Health Care Settings 2004
Occupational Safety and Health Administration (OSHA)	
Hospital Training Tool Hospital eTool http://www.osha.gov/SLTC/etools/hospital/index.html	A stand-alone, interactive, Web-based training tool on occupational safety and health topics. This eTool focuses on some of the hazards and controls found in the hospital setting, and describes standard requirements as well as recommended safe work practices for employee safety and health
Standards Part 1910 – OSHA standards http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9696	Standards for health care facilities including hazardous materials and PPE
Manual OSHA Technical Manual (OTM) Section VI: Chapter 2 Controlling Occupational Exposure to Hazardous Drugs http://www.osha.gov/dts/osta/otm/otm_vi/otm_vi_2.html	OSHA Compliance Safety and Health Officers (CSHOs) use the OTM as a reference for technical information on occupational safety and health issues
Hospital eTool Healthcare Wide Hazards: Hazardous Chemicals http://www.osha.gov/SLTC/etools/hospital/hazards/hazchem/haz.html	Website that covers a number of aspects of the hospital setting in regards to hazardous drug handling
Oncology Nurses Society (ONS)	
Publication Safe Handling of Hazardous Drugs (Second Edition) http://www.ons.org/ClinicalResources/SafeHandling	This publication includes information on procedures needed to promote safety in the workplace. Information on issues such as drug administration, management of spills, and safety measures as well as details on the adverse effects of hazardous drugs and evidence of occupational hazardous drug exposure are included.

Resources 3-5: Hazardous Drugs and Substances (continued)

Title and Website	Description
Oncology Nurses Society (ONS) [continued]	
Standards ASCO/ONS Chemotherapy Safety standards http://www.ons.org/Publications/Books/Excerpts/INPU0542toc	ONS and the American Society of Clinical Oncology (ASCO) have collaborated to develop the first national standards for the safe administration of chemotherapy drugs, which was released in 2009 and focused on the adult population in the ambulatory setting. In 2011 a workgroup was convened to review feedback and revise the safety standards as needed. The scope has been extended to both the outpatient and inpatient settings.
Washington State	
Washington Department of Labor and Industries Hazardous Drugs Rule http://www.washingtonworkplacelaw.com/regulatory-compliance/new-duties-for-health-care-facilities-to-protect-workers-against-hazardous-drugs/	New duties for health care facilities to protect workers against hazardous drugs

providing imaging radiation (and fluoroscopy) to the pediatric patient.⁸⁵ Similarly, the Image Wisely program from the American College of Radiology and the Radiological Society of North America in collaboration with the American Society of Radiologic Technologists, provides imaging guidelines for adult patients.⁸⁶ Multiple federal agencies provide oversight and regulation in the area of medical devices that emit radiation. For example, the Food and Drug Administration (FDA) must be notified of any medical device-related incident that results in the death of a staff member or the hospitalization of three or more staff members.⁶ The FDA also oversees the MedWatch program (a safety and adverse event reporting program) and the Center for Devices and Radiological Health addresses the safety and effectiveness of medical devices.⁶ As with all risks in the health care setting, a safety culture that holds safety as a core organization value and focus will further promote safety in medical radiation applications.

In August 2011, The Joint Commission issued a Sentinel Event Alert on the radiation risks of diagnostic imaging.⁶² The alert highlights contributing factors to sentinel events and actions that health care organizations can take to help eliminate avoidable radiation doses. Contributing factors

to, and activities that can help eliminate, avoidable radiation doses include the following:

- Awareness of the potential dangers from diagnostic radiation among organizational leadership, staff, and patients
- Development of a comprehensive patient safety program, including education about dosing in imaging departments
- Knowledge regarding typical doses
- Adequate awareness among physicians and other clinicians about the levels of radiation typically used and related risks⁸⁷⁻⁹⁰
- Training in the use of complex new technology⁹¹
- Guidance in the appropriate use of potentially dangerous procedures and equipment⁹²
- Adequately trained and competent staff
- Knowledge regarding typical doses
- Clear protocols that identify the maximum dose for each type of study
- Consulting with a qualified medical physicist when designing or altering scan protocols
- Communication among clinicians, medical physicists, technologists, and staff
- Safety, operational, and functional checks of the equipment before initial use and periodically thereafter

The *Sentinel Event Alert* further advises that organizations can reduce risks related to avoidable diagnostic radiation through raising staff and patient awareness of the increased risks associated with cumulative doses and by providing the following:

- The right test
- The right dose
- Effective processes
- Safe technology
- Safety culture

Additional information including specific action steps within each of these areas is available from: http://www.jointcommission.org/sentinel_event.aspx, Issue 47, August 24, 2011.⁶²

3.4 Violence in the Health Care Setting

3.4.1 Assault and Violence Prevention and Management, Security

Violence in the workplace is not a new phenomenon. However, over the past several years media coverage of incidents ranging from shootings to physical assaults have raised public awareness that health care settings are not immune to workplace violence.^{93–97} WHO defines *violence* as “the intentional use of physical force or power, threatened or actual, against oneself, another person, or against a group or community that either results in or has a high likelihood of resulting in injury, death, psychological harm, mal-development or deprivation.”⁹⁸ Workplace violence has been further defined by NIOSH as “violent acts (including physical assaults and threats of assaults) directed toward persons at work or on duty.”⁹⁹

Violence in the health care setting encompasses a range of behaviors and actions from criminal assaults to intimidation. Forms of intimidation can manifest as verbal (offensive or threatening language) and psychological.² Sexual harassment poses another threat to health care workers and to patients. To recognize the potential risks and develop efficacious solutions, the issues of violence and security call for an integrated approach to safety planning for patients, health care staff, visitors, and others. This section discusses a broad spectrum of violent acts, both physical and nonphysical, as well as how they might manifest and be addressed in the varied settings in which health care services are delivered.

3.4.1.1 Impact on Patients and Workers

Physical Violence in the Health Care Workplace

The provision of health care services has traditionally been associated with the acute care hospital. However, advances in technology and changes in reimbursement have shifted a large portion of service delivery to the patient’s home and other outpatient venues. Specialty care such as behavioral health services may be delivered in freestanding institutions. Care settings for the aged and cognitively impaired include skilled and nonskilled care facilities as well as assisted living. Each of these health care settings share common issues as well as having unique challenges and safety risks for staff and patients.

Hospitals

The hospital setting presents an array of risks for violence impacting staff and patients. Recognized high-impact areas include the emergency department, psychiatric unit, and waiting rooms.⁹⁹ In addition to staff and patients, hospitals are open to access by visitors, physicians, delivery personnel, and other members of the public. Hospitals also have multiple security sensitive areas, including the newborn nursery unit, pharmacy, and patient record storage.¹⁰⁰

Hospitals are increasingly experiencing active threats. An active threat is a situation that occurs without warning, quickly degenerates, and has the potential to cause death or serious injury.¹⁰¹ Active threats such as an armed attacker place everyone at risk but are less common than other forms of violence. Disruptive behavior and assaults by patients against staff and other patients is a far more significant problem for most health care organizations than the armed intruder. Data from the BLS for 1999 indicate that hospital workers had a rate of nonfatal assaults of 8.3 per 10,000 workers—far higher than the rate for private-sector industries of 2 per 10,000 workers.⁹⁹ While staff is usually at greatest risk when a patient becomes violent, other patients can also be targeted, as occurred in 2008 when a patient noted to be angry and anxious on admission awoke the following morning and began punching his roommate in the face.¹⁰² As noted previously, patient care areas at greater risk for violence include emergency rooms, waiting rooms, mental health units, and units for cognitively impaired.^{2,100,103,104} Nurses are a primary target for violence although physicians, other staff, and patients can also be impacted. Types of violent interactions identified by nurses include physical

Resources 3-6: Radiation

Title and Website	Description
American College of Radiology (ACR), the Radiological Society of North America (RSNA)	
Initiative A collaborative initiative of the American College of Radiology (ACR), the Radiological Society of North America (RSNA), the American Society of Radiologic Technologists (ASRT), and the American Association of Physicists in Medicine (AAPM) Image Wisely http://www.imagewisely.org	The initiative aims to optimize the use of radiation in adult medical imaging and to ensure that patients receive only necessary scans. Radiologists, medical physicists, and radiologic technologists are encouraged to visit imagewisely.org where they can take the pledge to Image Wisely.
Publication Appropriateness Criteria http://www.acr.org/Quality-Safety/Appropriateness-Criteria/About-AC	The American College of Radiology states that the criteria are evidence-based guidelines to assist referring physicians and other providers in making the most appropriate imaging or treatment decision for a specific clinical condition. By employing these guidelines, providers enhance quality of care and contribute to the most efficacious use of radiology.
National Institute for Occupational Safety and Health (NIOSH)	
Report Condon M, Chen L, and Weissman D. Chapter 15: Chemical and Other Hazardous Exposures In: US Department of Health and Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health [Internet]. State of the Sector Healthcare and Social Assistance: Identification of Research Opportunities for the Next Decade of NORA. DHHS (NIOSH) Publication Number 2009-139. Available from: http://www.cdc.gov/niosh/docs/2009-139	This 236-page document, developed by the NORA Healthcare and Social Assistance Sector Council, addresses the "state of the sector," including magnitude and consequences of known and emerging health and safety problems, critical research gaps, and research needs that should be addressed over the next decade of NORA. Chapter 15 discusses chemical and other hazardous exposures.
The Alliance for Radiation Safety in Pediatric Imaging	
Initiative Image Gently http://www.imagegently.org Founding agencies of the alliance include: The Society for Pediatric Radiology, American Association of Physicists in Medicine, American College of Radiology, and American Society of Radiologic Technologists	The Image Gently campaign is an initiative of the Alliance for Radiation Safety in Pediatric Imaging. The campaign goal is to change practice by increasing awareness of the opportunities to promote radiation protection in the imaging of children.
The Joint Commission	
Sentinel Event Alert Issue 47 Radiation Risks of Diagnostic Imaging http://www.jointcommission.org/sea_issue_47/	Alert describing the risks of unintended radiation exposure related to diagnostic imaging as well as suggested steps to prevent occurrences in the future.

assault; verbal attack, including swearing or threat-making; and unwanted physical contact.¹⁰⁵ In several studies, the percentage of emergency room nurses reporting assaults or being victims of violence ranged from 8–67%.^{106,107} This number may seem alarming, but in fact, the real numbers are probably even higher. Many health care staff, especially those working in high-risk units, do not report assaults,¹⁰⁸ sometimes expressing the belief that it is an unavoidable part of the job.^{109,110} Protecting staff and patients from active threats is a critical responsibility for management of health care institutions.

Home Care

Home care represents one of the fastest growing segments of health care services. The home care setting possesses some of the same risks for violence found in the hospital setting but also presents others unique to the community environment. For example, staff may be working alone in high risk districts with known criminal or gang-related activity. The presence of other household members, firearms, animals, and illicit drugs may present additional safety risks.^{111,112} Night visits, lack of safety training, and failure to provide security escorts also increase the risks for home health workers. Most significantly, the security of the client's home and the community environment are not under the control of the home care agency, thus eliminating prevention options available in the institutional setting (see Sidebar 3-5, page 98).

Recent research has suggested that staff and patient safety in home health care are linked.¹¹³ It has been observed that staff response to safety risks may impact service delivery by causing visits to be shortened, avoided, or even cancelled, thereby affecting quality of and access to care.¹¹¹

Other Care Settings

Risks for violence are noted to be high in facilities providing residential care and treatment for the aged, cognitively impaired, and mentally ill. In fact, all types of aggressive behaviors, including nonfatal physical and verbal assaults, occur in this care setting.¹¹⁴

Nursing assistants and support staff are often the target for these attacks. A national survey conducted in 2004 of nursing assistants working in nursing homes found that 34% of respondents reported having experienced physical injuries resulting from resident assaults in the previous year.¹¹⁵ The survey further noted that factors associated with assault-related injury included mandatory overtime and insufficient

Sidebar 3-4: What Are the Risk Factors for Violence?

The risk factors for violence vary across settings depending on location, size, and type of care. Common risk factors include the following:

- Staff work practices
 - Working alone
 - Working when understaffed—especially during meal times and visiting hours
 - Transporting patients
- Environmental factors
 - Long waits for service
 - Overcrowded, uncomfortable waiting rooms
 - Poor environmental design
 - Inadequate security
 - Unrestricted movement of the public
 - Poorly lit corridors, rooms, parking lots, and other areas
 - Lack of staff training and policies for preventing and managing crises with potentially volatile patients
- Patient population factors
 - Working directly with volatile people, especially if they are under the influence of drugs or alcohol or have a history of violence or certain psychotic diagnosis
 - Access to firearms

Adapted from source: Department of Health and Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health [Internet]. Cincinnati (OH): Department of Health and Human Services; c2002 [updated 2002 Apr; cited 2012 Jan 31]. Violence: Occupational Hazards in Hospitals, DHHS (NIOSH) Publication No. 2002-101; [about 15 p.]. Available from: <http://www.cdc.gov/niosh/docs/2002-101/>.

time to assist residents with their activities of daily living. Residents with behavioral and psychiatric disturbances pose greater risks for violent acts.

Bullying, Harassment, and Disruptive Behaviors Among Health Care Professionals

The health care workplace is a complex environment in which a variety of professionals interact with each other as well as patients, families, students in health care disciplines, and others. As the health care work environment has come under more scrutiny, attention has been drawn to the prevalence and impact of disruptive behaviors among health care professionals.

Sidebar 3-5: Risks for Violence in Home Visits

The risk for violence in home health care is influenced by many factors and will vary by the geographic location, types of services provided, and agency resources. In one study to develop and test three measures for assessing the risk of violence toward staff making home visits, the following risk factors were identified:

- A household where someone has a prior history of violent behavior
- A visit in which either the client/patient or household members are under the influence of alcohol or illicit drugs
- A visit to any household where someone is dually diagnosed with a substance abuse disorder and a mental illness
- A visit providing personal care to a client with a cognitive impairment
- A household where lethal weapons (such as guns) are not locked up
- The status of the risk factors is unknown.

Source: McPhaul K, Lipscomb J, Johnson J. Assessing risk for violence on home health visits. *Home Healthc Nurse*. 2010 May;28(5):278–289. Used with permission.

Sidebar 3-6: Examples of Disruptive Behaviors

- Targeting individuals for mistreatment
- Belittling or denigrating someone's opinion
- Using condescending language and attitude
- Engaging in patronizing nonverbal communications, such as eye rolling, raised eyebrows, smirking, and so on
- Refusing to answer legitimate questions
- Incessantly criticizing, finding fault, and scapegoating
- Displaying an attitude of superiority regarding another's knowledge, experience, and/or skills
- Undermining the effectiveness of a person or team
- Spreading rumors and making false accusations
- Putting staff members in conflict with each other
- Engaging in tantrums and angry outbursts
- Engaging in unnecessary disruption
- Assaulting a fellow employee

Adapted from source: The Joint Commission. Putting the Brakes on Health Care "Road Rage." *Environment of Care News*. Oak Brook (IL): Joint Commission Resources; 2010 Jan [cited 2012 Jan 30];13(1):[about 3 p.].

A range of behaviors, from bullying to harassment to what is termed "horizontal" or "lateral" violence are included (see Glossary, page 140 for a full description of included behaviors). In a review of the research, Vessey et al.¹¹⁶ noted that bullying differed from horizontal violence "in that a real or perceived power differential between the instigator and recipient must be present in bullying, while horizontal violence occurs among peers."^{116,(p.136)} However, they also noted that all of these terms are used interchangeably in the literature. For the purposes of their review, the authors defined bullying, harassment, and horizontal violence (BHHV) collectively as "repeated, offensive, abusive, intimidating, or insulting behavior, abuse of power, or unfair sanctions that makes recipients upset and feel humiliated, vulnerable, or threatened, creating stress and undermining their self-confidence."^{116,(p.136)}

Nursing is frequently the professional group identified as victims and perpetrators of horizontal violence. Nurses, especially those who have recently graduated or are new to the unit, can often be targeted.¹¹⁷ In addition, the historical role of nurses in a hierarchical organization has often placed them in vulnerable positions. However, this type of violence is not limited to nurses. It has been reported across many other health care team members, including pharmacists, therapists, nursing assistants, and support staff.^{116,118}

The dynamic nature of health care and the unique cultural environment contribute to the climate in which disruptive behaviors can occur. Specifically, working in high stress and emotional situations, often under staffing constraints and compounded by factors such as fatigue, are contributing risk factors.¹¹⁸ The impact of disruptive behaviors in the workplace on staff and patients is not insignificant. The workplace can become an unhealthy and even hostile environment, increasing the risk to the organization for litigation from both employees and patients.¹¹⁸ Vessey et al.¹¹⁶ noted that the literature documents a range of responses in staff who are victims of horizontal violence, including, but not limited to, stress, avoidance and withdrawal behaviors, physical symptoms from sleep disorders to headaches, anxiety, depression, and loss of confidence and self-esteem. The reviewed research further demonstrated that victimized nurses experienced decreased self-confidence and competence; potentially influencing the quality of nursing care provided and subsequently patient care outcomes. Respondents to a 2004 survey by The Institute for Safe Medication Practices

Side Bar 3-7: Factors Contributing to Behaviors that Undermine a Culture of Safety

- High-stress environments
- High patient acuity
- Increased productivity demands
- Cost-containment requirements
- Embedded hierarchies
- Daily changes in shifts, rotations, and support staff

Source: The Joint Commission [Internet]. Oakbrook Terrace (IL): The Joint Commission: c2012 [updated 2008 Jul 9; cited 2012 Jan 30]. Sentinel Event Alert, Issue 40: Behaviors that undermine a culture of safety; [about 3 p.]. Available from: http://www.jointcommission.org/sentinel_event_alert_issue_40_behaviors_that_undermine_a_culture_of_safety/.

noted that a previous experience of verbal abuse when contacting a physician to question or clarify an order had influenced a future decision to question a medication order.¹¹⁹ The compromise to communications critical to safe patient care caused by disruptive behaviors between team members increases the risk for errors and adverse events. It also impacts the health and well being of health care professionals, whether they are the direct target or an observing bystander.

3.4.1.2 Examples of Interventions

As discussed in the preceding paragraphs, the types of violence and the multiple settings in which health care services are provided present unique challenges to planning preventive strategies. Successful violence prevention must begin with a safety vision championed by organizational leadership and supported by resources across departments and professional disciplines. It should also include patient concerns. In 1996 OSHA issued guidelines for preventing workplace violence in health care that could be applied to reduce risks across settings and are applicable to a wide range of health care workers. (See Sidebar 3-8.) In combination with other industry standards and regulations addressing patient safety, health care organizations can use these resources to develop a violence prevention program that meets the needs of staff and patients.

Criminal Acts and Active Threats

Managing the risk for serious—even criminal—violent events requires multiple approaches. The advent of the 2001

Sidebar 3-8: Elements for Developing a Violence Prevention Program in Health Care Organizations

- 1. Management commitment** must be evident in the form of high level management involvement and support for a written workplace violence prevention policy and implementation.
- 2. Meaningful employee involvement** in policy development, joint management-worker violence prevention committees, post-assault counseling and debriefing, and follow-up are all critical program components.
- 3. Worksite analysis** includes regular walk-through surveys of all patient care areas and the collection and review of all reports of worker assault. A successful job hazard analysis must include strategies and policies for encouraging the reporting of all incidents of workplace violence, including verbal threats that do not result in physical injury.
- 4. Hazard prevention and control** includes the installation and maintenance of alarm systems in high risk areas. It may also involve the training and posting of security personnel in emergency departments. Adequate staffing is an essential hazard prevention measure, as is adequate lighting and control of access to staff offices and secluded work areas.
- 5. Training and education** must include preplacement and periodic, educationally appropriate training regarding the risk factors for violence in the health care environment and control measures available to prevent violent incidents. Training should include skills in aggressive behavior identification and management, especially for staff working in the mental health and emergency departments.

Adapted from source: US Department of Labor. Occupational Safety and Health Administration [Internet]. Washington (DC); [updated 1996; cited 2012 Jan 30]. Guidelines for Preventing Workplace Violence for Health Care & Social Service Workers, OSHA 3148; [about 15 p.]. Available from: <http://www.osha.gov/Publications/OSHA3148/osha3148.html>.

terrorist attack on the United States raised a new level of awareness for the potential risks intrinsic to public places such as airports and high-impact targets such as nuclear power plants. The potential for criminal activity or other active threats requires assessing the entire physical plant's security for the protection of patients and staff alike.

Until recently, public awareness of serious, even fatal, physical assaults in the health care workplace has been limited. But today, publicized shootings and acts of violence in health care settings have raised a new awareness that no workplace—even a hospital—is immune from these dangers. Furthermore, data suggests that the incidence of violence in health care is increasing.¹²⁰

Security—Institutional Setting

Hospitals in particular are at risk for criminal activity such as violent acts by individuals, kidnapping, and theft of patient data, pharmacologic or radiologic agents, and other sensitive materials. Therefore, providing for the security of the physical environment is an important element of protecting patients and workers. The importance of securing the structures in which health care services are provided cannot be overstated and can present significant challenges when the public and multiple care providers and staff access these facilities around the clock.¹⁰⁰ Organizations should begin with a thorough assessment of building security, as noted above. Special attention should be paid to high risk areas such as the emergency department, where there is a large volume of traffic and high stress levels.¹⁰⁰ Access to sensitive areas including pharmacy, lab and x-ray, medical records, and the mother-baby unit requires additional levels of security.

Building Design

Building new or remodeling existing health care facilities is an opportunity to integrate functions of safety and security into the building structure and design. Emerging evidence-based design solutions are supporting construction of facilities that maximize patient care delivery in environments that are not only secure but also promote patient and worker well-being. Planning a safer health care facility is enhanced by integrating architectural design and the needs of patients, families, and health care professionals.¹²¹

Controlling Access

Examples of traditional approaches to controlling access include physical barriers, such as door locks and fences, combined with special lighting, cameras, and security guards. Sophisticated electronic security systems using technology such as key card entry and user recognition are increasingly being deployed. This allows for selectively controlling access only by approved individuals. But these systems can be expensive and may create a false sense of security when used as the sole solution. Technology alone

will not fully provide effective facility security. It must be combined with comprehensive employee training.

In a review of the Joint Commission's Sentinel Event Database from 2004 to 2009, the following contributing causal factors regarding criminal events in health care organizations were identified most frequently¹⁰⁰:

- *Leadership*, noted in 62% of the events, most notably problems in the areas of policy and procedure development and implementation.
- *Human resources—related factors*, noted in 60% of the events, such as the increased need for staff education and competency assessment processes.
- *Assessment*, noted in 58% of the events, particularly in the areas of flawed patient observation protocols, inadequate assessment tools, and lack of psychiatric assessment.
- *Communication failure*, noted in 53% of the events, among staff, patients, and families.
- *Physical environment*, noted in 36% of the events, in terms of deficiencies in general environmental safety and security practices.
- *Problems in care planning*, information management, and patient education were causal factors identified less frequently.

Preventing violence and enhancing security requires a multi-pronged approach that includes defined and successfully implemented policies and procedures, together with a well-educated workforce that have practiced responding to threatening situations. Finally, nothing can substitute for alert employees who speak up. As noted by Russell Colling, MS, CHPA:

“The most important factor in protecting patients from harm is the caregiver—security is a people action and requires staff taking responsibility, asking questions, and reporting any and all threats or suspicious events.”^{100(p. 2)}

A more extensive list of suggested actions to prevent violence in health care organizations can be found in the Joint Commission *Sentinel Event Alert* Issue 45 (see Resources 3-7, page 104).¹⁰⁰

Security—Non-Institutional Settings

Institutional interventions cannot be fully duplicated in the community workplace. Obvious limitations are related to the lack of control over the physical structure in which serv-

ices are delivered, eliminating the options for building security outlined previously. However, there are still interventions that should be implemented to protect staff and patients in the community setting.

Developing a safety program for the home care setting involves including elements common to the institutional setting, such as leadership; policies and procedures; staff education and practice; and assessment of the patient, informal caregivers, and family members. It will also require scrutiny of the physical environment—both in the home and the immediate community—as well as elements unique to the setting. Conducting thorough and ongoing assessments of the hazards through surveillance will inform safety program planning, resource allocation, and development of risk prevention strategies. Staff education and training in violence prevention and response to disruptive behavior is a key element of a safety program. Involving the patient and family in safety planning is also critical, as they control the care environment and will be the ones to implement plans suggested by the visiting health professional.¹¹³ Home care agencies can also provide services to staff, such as alarms, cell phones, and security escorts. Communication mechanisms to ensure that staff is informed of in-home threats related to weapons, animals, substance abuse, mental illness, and so on are key to safe visitation.

Violence Prevention—Disruptive Behavior

Methods to address disruptive behaviors displayed by patients and families toward health care personnel differ from those directed toward horizontal violence. While violent verbal outbursts by patients and families cannot always be predicted, health care personnel can be attuned to signs of increasing agitation. Anxiety connected with pain and fear, compounded by long waiting periods and lack of information, can become triggers of explosive behavior. Early intervention, such as keeping patients and families informed, will help control anxiety.¹⁰⁶ When disruptive behaviors do occur, staff who have been educated in methods of de-escalating these behaviors may be able to effectively calm the patient and enhance care outcomes. Some programs have been developed to improve management and care outcomes for patients known to have a history of disruptive behavior (see Case Study 3-6, page 108).

As noted previously, horizontal violence involves many variables, both individual and organizational. All health care organizations are encouraged to adopt policies to indicate this behavior is unacceptable.^{117,118} This policy

Sidebar 3-9: Strategies for Managing Potentially Explosive Behavior

- **Ensure your personal safety.** Assess your safety in each situation, watch for warning signs, and don't ignore your feelings. Use simple, direct commands to gain patient cooperation, and protect yourself by asking for assistance if necessary.
- **Keep a colleague informed.** Always tell a colleague where you're going and about how long you expect to be with a patient.
- **Assess the area:** Inspect the patient surroundings for items that might be used as weapons, stay at least two arm lengths away from an agitated patient, and don't turn your back on an agitated patient.
- **Create an exit:** Be aware of where the exit is located and don't allow the patient to get between you and the door.
- **Direct bystanders away:** For their own and the patient's protection and to prevent them from accidentally getting in the way, ask bystanders to move away from the area.
- **Keep waiting areas separate:** If possible, separate patients, families, or others involved in a conflict to different waiting areas. If not possible, request additional security personnel.
- **Use verbal interventions:** Use established techniques and recommended verbal responses to de-escalate agitation. Avoid arguing or using inflammatory statements.
- **Treat the patient with dignity and respect:** Communicate respect by listening carefully and demonstrating nonaggressive, nonchallenging body language.
- **Offer choices:** Give the patient and family a sense of control by offering choices when appropriate.
- **Help patients regain self-control:** Ask patients what would help them calm down or make them comfortable. Show them you are trying to meet their needs.

Source: Leckey DK. Ten strategies to extinguish potentially explosive behavior. *Nursing*. 2011 Aug;41(8):55-59. Used with permission.

should be supported by defined strategies and enforcement. Suggested areas for improvement include interdisciplinary collaboration, communication, and education and training.¹¹⁷ Organizations may wish to start by surveying staff to gain an understanding of the prevalence and nature of disruptive behaviors (a table describing five instruments to measure constructs of disruptive behavior is provided in Vessey et al., 2010, pages 148–149).¹¹⁶

3.4.1.3 Case Studies

The following case studies address different aspects of violence prevention and security within various health care settings. They present a range of interventions from the development of a violence prevention program involving patients and staff in a public hospital behavioral health facility, to a unique security system in a large multifacility health system, to a behavioral management program for patients with recurring episodes of disruptive behavior cared for in a national health care system.

Resources 3-7: Assaults and Violence

Title and Website	Description
American Association of Critical-Care Nurses	
Position Statement Zero Tolerance for Abuse (2004) http://www.aacn.org/wd/practice/docs/publicpolicy/zero-tolerance-for-abuse.pdf	Statement condemns acts of abuse perpetrated by or against any person. It calls for a zero-tolerance stance on any abuse and disrespect in the workplace.
Position Statement Workplace Violence Prevention (2004) http://www.aacn.org/wd/practice/docs/publicpolicy/workplace_violence.pdf	Statement condemns acts of violence perpetrated by or against any person and calls upon health care institutions to create organized programs to prevent and combat workplace violence
American Nurses Association (ANA)	
Resolution Workplace Abuse and Harassment of Nurses (2006) http://nursingworld.org/MainMenuCategories/WorkplaceSafety/Healthy-Nurse/WorkplaceAbuseandHarassmentofNurses-1.pdf	Summary of proceedings of the American Nurses Association 2006 House of Delegates on Abuse and Harassment of Nurses in the Workplace.
Brochure ANA Brochure: Preventing Workplace Violence http://nursingworld.org/MainMenuCategories/WorkplaceSafety/bullyingworkplaceviolence/PreventingWorkplaceViolence.pdf	Discusses three categories of risk factors: environmental, work practices, and characteristics of victims and perpetrator
Brochure ANA Brochure: Your Health and Safety Rights http://nursingworld.org/MainMenuCategories/WorkplaceSafety/bullyingworkplaceviolence/YourHealthandSafetyRights.pdf	Discusses risk factors that can lead to workplace violence, and ways to prevent workplace violence and take action if violence occurs
Web Site http://nursingworld.org/MainMenuCategories/WorkplaceSafety/bullyingworkplaceviolence	This site includes both complimentary informational materials, and educational tools and courses for purchase.

Resources 3-7: Assaults and Violence (continued)

Title and Website	Description
ECRI Institute	
Publication ECRI Institute [Internet]. Plymouth Meeting (PA): 2005 Sep [cited 2010 Mar 11]. Violence in Healthcare Facilities. Healthcare Risk Control. Available from: https://www.ecri.org/Forms/Pages/Violence_in_Healthcare_Facilities.aspx	Topics include techniques for identifying potentially violent individuals, violence de-escalation tools that health care workers can employ, violence management training, conducting a violence audit, and responding in the wake of a violent event
International Critical Incident Stress Foundation	
Course Assaulted Staff Action Program (ASAP) Coping with the Psychological Aftermath of Violence http://www.icisf.org	A course designed for staff in agencies where violence is a regular issue. ASAP is a Critical Incident Stress Management intervention (CISM) to assist persons who are victims of violence and/or who witness violence happening to others.
International Association for Healthcare Security and Safety	
Healthcare Security: Basic Industry Guidelines http://www.iahss.org/About/Guidelines-Preview.asp	A resource for use in planning, developing, and managing a security management plan, conducting security training and investigations, identifying high risk and more
National Institute for Occupational Safety and Health (NIOSH)	
Fast Facts Home Healthcare Workers How to Prevent Violence on the Job http://www.cdc.gov/niosh/docs/2012-118/	A fact sheet on risks in home care providing advice for the employer and employee in preventing and managing danger
Report Palermo T and Hodgson MJ. Chapter 13: Violence In: US Department of Health and Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health [Internet]. State of the Sector Healthcare and Social Assistance: Identification of Research Opportunities for the Next Decade of NORA. DHHS (NIOSH) Publication Number 2009-139. Available from: http://www.cdc.gov/niosh/docs/2009-139	This 236-page document, developed by the NORA Healthcare and Social Assistance Sector Council, addresses the "state of the sector," including magnitude and consequences of known and emerging health and safety problems, critical research gaps, and research needs that should be addressed over the next decade of NORA. Chapter 13 discusses violence.
Article Workplace Violence in the Healthcare Setting http://search.medscape.com/viewarticle/749441 Dan Hartley, EdD, and Marilyn Ridenour, BSN, MBA, MPH	Examines three diverse data sets, each with a different level of injury severity that provide information on the prevalence of workplace violence and the need for prevention strategies in all health care facilities These authors are also developing a free online training course that should be available from CDC in 2012.
Website Occupational Hazards in Hospitals http://www.cdc.gov/niosh/topics/violence/	Provides links to NIOSH's field studies and surveys, as well as publications in occupational violence in regard to risk factors and prevention strategies

Resources 3-7: Assaults and Violence (continued)

Title and Website	Description
National Institute for Occupational Safety and Health (NIOSH) [continued]	
Publication Workplace Violence Prevention Strategies and Research Needs http://www.cdc.gov/niosh/docs/2006-144/	Provides a useful framework for thinking about the current state of workplace violence research, prevention, and communication activities in the United States
Occupational Safety and Health Administration (OSHA)	
Booklet Guidelines for Preventing Workplace Violence for Health Care and Social Service Workers (2004) http://www.osha.gov/Publications/osha3148.pdf	Advisory guidelines intended to help employers establish effective workplace violence prevention programs adapted to their specific worksite. It does not address issues related to patient care and does not provide standards or regulations.
The International Council of Nurses (ICN)	
Position Statement Abuse and Violence Against Nursing Personnel http://www.icn.ch/images/stories/documents/publications/position_statements/C01_Abuse_Violence_Nsg_Personnel.pdf	Condemns all forms of abuse and violence against nursing personnel, ranging from passive aggression to homicide and including sexual harassment
The Joint Commission	
Sentinel Event Alert Issue 45: Preventing Violence in the Health Care Setting http://www.jointcommission.org/sentinel_event_alert_issue_45_preventing_violence_in_the_health_care_setting/	Addresses the increasing problem of violence in the health care setting and provides suggested preventive actions that organizations can take
Sentinel Event Alert Issue 40: Behaviors That Undermine a Culture of Safety http://www.jointcommission.org/sentinel_event_alert_issue_40_behaviors_that_undermine_a_culture_of_safety/	Discusses intimidating and disruptive behaviors that can foster medical errors and contribute to poor patient satisfaction and to preventable adverse outcomes

CASE STUDY 3-4: LEMUEL SHATTUCK HOSPITAL: REDUCING ASSAULTS IN A BEHAVIORAL HEALTH UNIT

Lemuel Shattuck Hospital
Jamaica Plain, Massachusetts

The Violence Reduction Program

In response to a high rate of assaults resulting in injuries by patients against other patients and staff, leadership for

the Metro Boston Mental Health Units (MBMHU) of the Lemuel Shattuck public health hospital sought to create a violence reduction program that combined existing best practices and evidence-based practices in use at this and other facilities. Founded in 1954, the hospital has 12 stories and 258 beds, with 143 medical beds on 4 floors and 115 behavioral health beds on 3 floors. Patients admitted to behavioral health come primarily from three sources: acute care hospitals (treatment has failed or patient presents a risk of violence to self or others); a correctional state psychiatric facility; and the courts. The median length of stay is approximately seven months. There are five behavioral health units with 23 patients each, along with limited on-site and extensive off-site rehabilitation

services, as most of the patients are able to leave the units during the day. These units provide mental health services for residents of Massachusetts, but especially in the greater Boston metropolitan area.

Defining the Program

In recognition of the risk for violence in this patient population, and in response to a high rate of assaults by patients against other patients and staff resulting in injuries, MBMHU's leadership began to examine evidence-based practices and active programs in use at other facilities in June 2010. Leaders established the primary goal to reduce incidents of assault through culture change, training, and clinical interventions. A multidisciplinary committee led by the chief operating officer and the director of nursing of the behavioral health units, with representation from social work, occupational therapy services, mental health workers, registered nurses, psychology services, and psychiatrists was convened to facilitate development and introduction of a violence reduction program within this organization. The group worked to define what constituted violence (actual versus attempted or threatened assaults).

The resulting program comprised three major activities:

1. *The Safety and Respect Group* – Staff and patients meet twice each week to increase awareness of the impact of violence and to suggest, teach, role-play and support alternatives to violence. In addition, the Safety and Respect group processes violent events in order to increase appreciation for the impact of violence in a therapeutic environment.
2. *The Assaulted Staff Action Program (ASAP)* – The ASAP is an ongoing statewide Massachusetts program that is operated at all Department of Mental Health inpatient facilities. At MBMHU, its purpose is to render “emotional first-aid” to assaulted staff, which includes debriefing, support, and follow-up. While there are several staff at this facility who provide these services, their numbers have not been able to keep up with demand, so MBMHU is attempting to recruit and train additional responders.
3. *Staff Education* – Staff receive regular education on how to prevent assault using effective communication techniques, how to recognize warning signs of aggression, and how to quickly identify when increased staff support is indicated.

Development and implementation of strategy one, the Safety and Respect Group, is described in more detail.

Introducing the Safety and Respect Group

The Safety and Respect group is a twice-weekly unit level meeting that focuses on conflict resolution, the impact of violence and assault, alternatives to violence, and other topics that contribute to violence prevention. The Safety and Respect pledge is said at the end of Safety and Respect meetings so that there is a strong experiential connection for patients on and off the unit (see Case Study Figure 3-3). This pledge is written on T-Shirts in Spanish and Portuguese for non-English-speaking patients.

Leadership for the group rotates between social work, occupational therapy, psychology, rehabilitation staff, and mental health workers, thereby supporting ownership at the unit level. Group facilitators meet weekly to ensure that there is consistency in how the group is run, as well as to plan for future meetings.

This program was initially introduced on a single unit (10 South) before being rolled out over time to four other units. In November 2011, the patients were offered an opportunity to sign a Safety and Respect pledge for the first time. Special T-shirts (see Case Study Figure 3-4) made by patients were distributed to all who signed the pledge. This event took place in the main lobby of the hospital and acted to reinforce already-existing program elements of violence reduction and, in particular, the Safety and Respect Group. There continue to be periodic pledge events on the units so that new admissions and patients who did not pledge the first time can participate when they are ready. Additional expressive therapies that include the use of music and ritual (for example, a candle-light walk) help to reinforce the groups' progress toward goals.

There has been robust patient participation in the group and recently a peer representative with previous “lived experience” has been hired to join the facilitator group. Feedback from staff and patients in 10 South generated interest in expanding the program. As of July 2012, the program has become active on all targeted units.

Assessing Program Impact

The Safety and Respect Group sessions have been well received by both patients and staff, who provided a great deal of positive feedback. Participants expressed they felt affirmed and supported; they appreciated having a safe place to discuss violence and aggression, and they believe the group supports a safer environment.

My Safety Pledge

Please recite this pledge out loud before signing, and repeat it often!

May I be Safe

May I be Happy

May I be Healthy

May I be free from inner and outer harm

May my heart be filled with compassion and wisdom

By signing this pledge I, _____, commit to actively participating in creating a safe and respectful community.

By accepting a “We all deserve to feel safe” shirt, I will wear it with pride and respect. I acknowledge that I can spread the message of safety to the wider community. I understand that safety is the responsibility of all of us.

Case Study Figure 3-3: Safety and Respect Pledge

Source: Lemuel Shattuck Hospital. Jamaica Plains, MA. Used with permission.



Case Study Figure 3-4: Safety T-Shirt

Source: Lemuel Shattuck Hospital. Jamaica Plains, MA. Used with permission.

Quantifying the impact of the Safety and Respect Group was more challenging. Initially, the workgroup determined that the unit of measurement for assessing program impact would be the number of patients assaulting rather than the number of assaults. This was because particular patients may engage in repeated assaults, therefore the number of assault events might be skewed by a single individual. Another complicating factor was the fact that patients transferred between units, and units were in different stages of implementing the Safety and Respect Group meetings. To better reflect the impact of the program, the group decided to include only patients who did not transfer as part of the unit's evaluation. However, these factors limited the size of the population of interest, so the evaluation period was expanded to six months. Though the initial decline in assaults did not maintain a consistent trend over time there were many anecdotal observations of fewer “retaliatory assaults” including assaults by patients who had been transferred to other units.

Eventually, the group determined that measuring “staff days lost from injury resulting from an assault” was a more useful and meaningful metric to track. Using this metric, the days lost declined from 316 (during January to June of 2011) to 206 (from July to December), which was a 35% decrease. This metric will continue to be used for program evaluation.

Celebrating Success and Looking Ahead

The hospital recognizes success at the unit-level in a number of ways. Success is rewarded with verbal praise and special food treats on the unit, such as an ice cream party after two weeks of no assaults. There are visual reminders on the unit as well, such as drawings of pizza slices depicting the number of days without an assault.

Patient and staff enthusiasm for the Safety and Respect Group continues to reinforce the value of this strategy in addressing safety for both patients and staff. The full implementation of the Safety and Respect Groups provides greater opportunities to evaluate the effectiveness and impact of the program over time.

**CASE STUDY 3-5:
ATLANTIC HEALTH: SECURING A HEALTH
SYSTEM RED CELL PROGRAM**

**Atlantic Health System
Morristown, New Jersey**

The “Red Cell” Program

Atlantic Health System (AHS) has 100-plus facilities with 11,000 employees systemwide and logs 145,000 emergency room visits annually between 3 acute care hospitals. In total, AHS maintains approximately 9 million square feet of physical plant and campus, spread throughout New Jersey. The terrorist attacks of September 11, 2001, followed by threats of anthrax and the sniper killings—as well as concern for security-sensitive assets such as nuclear material and vulnerable patient populations—served as an impetus for a comprehensive review of security at AHS. Protection and Security Services/Emergency Management leadership brought together administration, clinical, and patient safety staff to develop a new security-risk assessment program. This new program that includes infiltration (unauthorized access) testing is called a “Red Cell” program. Key elements of the program include quarterly infiltration surveys (inspections/attempts to gain access to security-sensitive areas) and Security Awareness Training (orientation and annual employee education on basic security principles). Any Red Cell program, by design, targets security-sensitive areas to test infiltration and report results.

Patients and families are engaged in education, too. For example, parents in the mother-baby unit are educated on infant security concepts promoted by the National Center for Missing and Exploited Children, such as identifying staff who wear specially marked identification cards. In addition to the quarterly infiltration surveys, facility security personnel regularly sweep the building and are visible to patients and families, especially at key times such as the end of visiting hours.

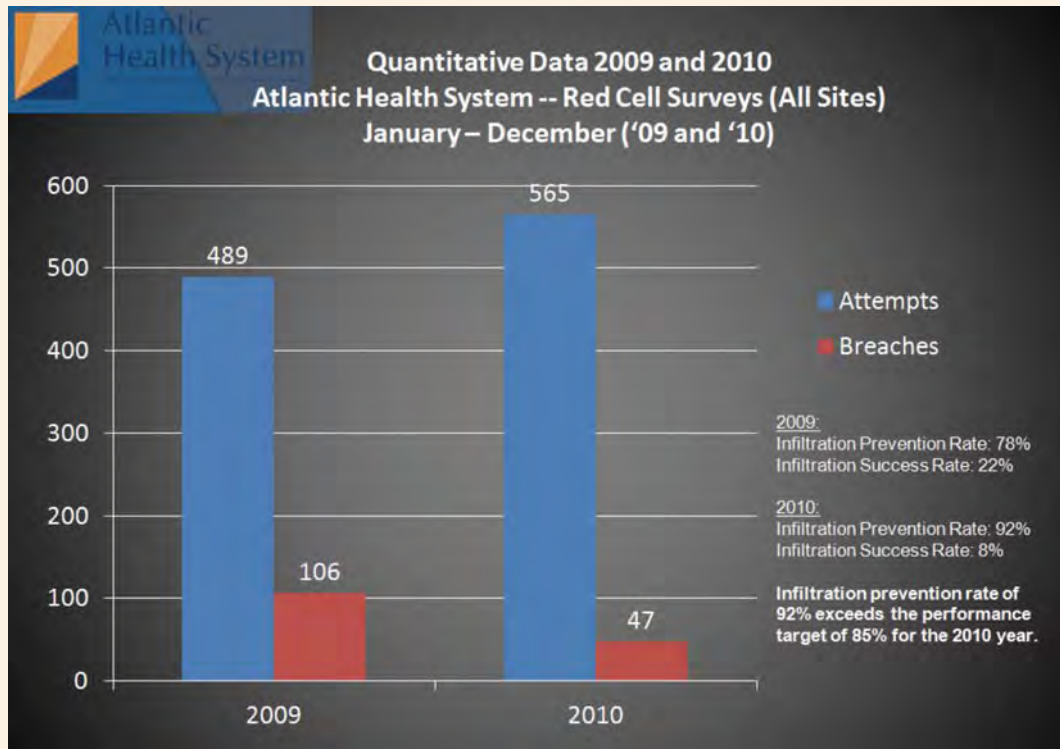
A team of contracted plainclothes security and law enforcement professionals conducts these surveys at AHS. However, infiltration surveys could be conducted at a minimal cost by using employees from different depart-

ments, sister facilities or even working with a volunteer organization. The survey tests locks and other access control equipment as well as the ability of employees to question or challenge an individual who may not be authorized to be in the area. According to Alan Robinson, Director of Protection and Security Services/Emergency Management, “The employee is critical—the best equipment can be defeated by one lax employee letting someone in who does not belong there.”

The impact of this innovative program has been evident in feedback from staff, patients, and families. Using written reports generated after each quarterly survey, data on the infiltration prevention rate has been tracked since 2009. In 2010, only 47 breaches occurred for 565 attempts, showing a successful infiltration prevention rate of 92% compared with a rate of 78% in 2009, exceeding the established 2010 performance goal of 85% (see Case Study Figure 3-5, page 108).

One report generated from responses to the annual employee engagement survey showed 86% of employees answering favorably to the safety and security item, “My location pays attention to health and safety.” Safety is now ranked as one of the top 10 areas of satisfaction. In addition, statistics that include data from occupational medicine demonstrate a significant reduction in workplace violence between 2007 and 2010. Furthermore, according to Donald Casey Jr., M.D., Chief Medical Officer and Vice President of Quality for AHS, “Physicians have noted the positive influence a safe environment has on patients and families when they are selecting a facility for care.”

In addition to positive internal responses, this program along with several other security initiatives managed by the AHS Protection and Security Services/Emergency Management Department has been recognized by Security Magazine and ranked fourth in a 2010 national review of 75 health care facilities. The magazine noted AHS as a security leader that demonstrated increased responsibility and utilized strategic business management approaches. As part of the evaluation, organizations must also demonstrate either quantitative and/or qualitative results. While the protection of sensitive materials and information is an important program outcome, maintaining the safety of all individuals within the health care facility is arguably its greatest success. The programs’ approaches are Internet protocol (IP) driven and enterprise-centric, allowing the



Case Study Figure 3-5: Red Cell Graphs 2009–2010 (Atlantic Health)

Source: Atlantic Health System. Morristown, NJ. Used with permission.

Protection and Security Services Department/Emergency Department to tie all AHS activities into a readily accessible, reportable, and auditable form. Additional information on the Atlantic Health System “Red Cell” Program is available from Alan Robinson, Director of Protection and Security Services/Emergency Management, Atlantic Health System, Morristown, New Jersey at alan.robinson@atlantichealth.org.

Source

Security Magazine [Internet]. Troy (MI): BNP Media; c2012 [updated 2010 Nov 1; cited 2012 Jan 30]. 2010 Security 500 List; [about 20 screens]. Available from: <http://www.securitymagazine.com/articles/2010-security-500-list-1>.

CASE STUDY 3-6: VETERANS HEALTH ADMINISTRATION (VHA) REDUCING DISRUPTIVE PATIENT BEHAVIOR: THE BEHAVIORAL THREAT MANAGEMENT PROGRAM

US Department of Veterans Affairs The Behavioral Threat Management Program

The Department of Veterans Affairs (VA), Veterans Health Administration (VHA) is committed to providing safe and effective care to all eligible veterans, including those who demonstrate serious behavioral problems and disrupt health care processes and facilities. Violence in the health care workplace represents a substantial hazard to patients and health care workers. Furthermore, violence and disruptive patient behavior pose obstacles to the delivery of safe and effective care. To meet this challenge, the VA initially developed a violence prevention program in the late 1970's.*

Currently, the Behavioral Threat Management Program consists of the following key components:

- Behavioral Threat Management Program (BTMP) – The overarching program responsible for systems threat assessment and management and for frontline worker protection strategies
- Prevention and Management of Disruptive Behavior Program (PMDB) – An employee education curriculum
- Disruptive Behavior Committee (DBC) – Facility-specific multidisciplinary teams under senior clinical leadership
- Automated Safety Incident Surveillance and Tracking System (ASISTS) – A national electronic injury management system
- Patient Record Flags (PRF) – A behavioral flag visible throughout the national electronic medical record system managed by the DBC that provides guidance on managing potentially violent patients

Disruptive behavior can affect the delivery of care by interfering with clinical examination, testing, and treatment. In many private sector systems it results in patient dismissal, though this approach represents a violation of patients' due process rights in the VA, as they are entitled to care by statute. The overall goals and consequences of the BTMP are improved quality of care for disruptive patients through the following:[†]

- Facility preparedness
- Successful interaction during the first few minutes of contact—critical to preventing later difficulties
- Improved control of the patient's behavior
- Delivery of better and more complete medical care

Health care providers have access to quick and reliable information that assists them in deploying appropriate interventions that enhance the safe delivery of care for both the patient and staff.

Defining Program Components

Behavior Threat Management Program: BTMP has three primary purposes. It conducts training, including one-week on-site mini-residencies for Disruptive Behavior Committee (DBC) chairs and members in formal threat assessment and management techniques, together with a monthly field training and management call. It guides overall violence prevention program evaluation and quality improvement. Finally, it defines gaps in policies and knowledge and identifies and provides solutions.

Prevention and Management of Disruptive Behavior: The PMDB curriculum is divided into the following four elements:

- 1) General knowledge
- 2) Personal safety skills (“break away” skills)
- 3) De-escalation skills
- 4) Therapeutic containment, that is, containment strategies for out-of-control patients

Hands-on training is required for parts 2, 3, and 4. That training relies on a national system of master trainers, with a structured process for development. The master trainers receive regular updates and skills evaluation/recalibration in violence prevention and management training. They are then deployed to develop trainers at the local facility level. Recalibration conferences maintain trainers' skill levels. Local trainers and DBC members complete the education and training for health care employees within each facility. Facilities identify the level of required training through a formal process of risk assessment. The curriculum has been continuously evaluated and updated over the past 25 years.

The DBC was initially developed at the Portland Veterans Administration Medical Center in the mid 1980s[‡] and was implemented as national policy and infrastructure. The DBC has a mission to conduct violence risk assessments and recommend behavioral management strategies captured in a note behind the electronic medical record. This interdisciplinary facility-level committee reports directly to the chief of staff. DBC membership across VA facilities must include a senior clinician with expertise in assessment of patient behavior, chief of staff, patient safety staff, a social worker, facility safety manager, nurse manager, chief of mental health services, and others.

As part of the threat assessment and management system, the clinically-led DBC assesses violent incidents, distinguishes various forms of affective and predatory violence, determines the likelihood of recurrence, and provides guidance on prevention. Various approaches used by the DBC to set limits with disruptive patients include warning letters, patient conferences, employee education, amendments to the patient's treatment plan, and health care treatment agreements.^{§||}

The VA pioneered a patient assessment process that combines clinical knowledge and decision making with safety and security approaches from law enforcement. It begins with a formal evaluation of any veteran/patient who creates

a significant or repeated disturbance. The DBC conducts a careful review of incident reports to identify patients at high risk for repeated violence. An early survey at one VA facility found that 25% of disruptive patients were responsible for 38% of all incidents.[†] If the committee reaches consensus that there is a pattern of seriously disruptive behavior, a Patient Record Flag (PRF) is added to the patient's electronic database record.

The PRF is an electronic flag that is designed to alert medical staff to the patient's potential for violence. It appears as an advisory note and triggers a subtle audio signal when the patient is checked in for an appointment. The flag provides a brief descriptive warning of past difficulties and allows clinicians to initiate appropriate measures before interacting with the patient. As with other medical information, precautionary flags are protected from general disclosure but are not concealed from patients.[‡]

In 2002, the VA mandated the use of an electronic injury management system to monitor injury reports and adverse staff events.[#] The ASISTS database provides a source for tracking the rate of reported employee assaults, which provides data for program assessment. A separate data system reports workers' compensation claims. Finally, VHA conducts national questionnaire surveys regularly to assess population-based response rates.

Changing the Assault Rates Over Time and Improving Quality of Care

A study to evaluate specific program dimensions led to the development and testing of a 110-question evaluation instrument.[#] The dimensions that were evaluated include the following: PMDB, committee formation and structure, training, workplace practices, recording systems, patient record flagging, formal threat assessment, environmental control, security precautions, and security rounds. The study was designed to examine the relationship between changes in the assault rates over time and the implementation of the violence prevention program in 138 VA facilities. After controlling for variables, including hospital characteristics, geographic region, and others, Mohr et al.[#] reported a modest change in national-level assault rates over a six-year period (2004–2009). Study authors identified several possible reasons for the modest change, including the following: off-setting facility-level assault rate decreases and increases, improved staff reporting of assaults leading to higher rates, and an increased number of patients seeking services for severe mental health conditions following deployment.

However, it was also observed that workers' compensation claims between 2001 and 2008 declined 40%, a fact that may suggest a reduction in the severity of assaults. A survey of VHA chiefs of staff shows satisfaction with violence prevention processes and perceptions of increased program effectiveness as policies are fully implemented. The violence prevention strategies support deployment of consistent, effective communication and behavior management techniques, leading to improved cooperation and complete clinic visits for difficult patients.

Important Lessons and Next Steps

The creation of a committee for clinical assessment and management of violence and threatening behavior, combined with training of frontline staff in verbal de-escalation techniques and use of other behavior management strategies, is a powerful tool that supports clinicians in managing difficult patients. The presence of a systemwide, accessible electronic record is essential for the appropriate functioning of a flag that is visible on all charts, regardless of where the patient presents for care. Patients and staff experience safer and more effective clinical interactions when behavior management recommendations are consistently implemented according to established policies.

Ongoing evaluation of program effectiveness, development of additional training in personal safety skills, and a more formal staff certification program and process are under development over the next two years. Continued program assessment will help identify other factors that impact the assault rate and inform the development of effective interventions to protect patients and health care workers from violence.

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3.5 Staffing, Fatigue, and Support for Health Care–Induced Emotional Distress

3.5.1 Workforce Staffing and Fatigue

Chapter 2 discussed practices of safety-sensitive industries such as adopting measures to reduce human and organizational-related risks for occupational injury and performance errors. The value of adapting characteristics of high reliability organizations to health care is to reduce the potential for adverse events for both workers and patients. Industries that operate around the clock share common challenges to meet workplace staffing demands.

Organizational staffing practices are increasingly being scrutinized against measures of performance and employee well-being, enhancing the understanding of this relationship. While health care organizations providing 24-hour care have always faced staffing challenges, several trends since the late 1970s, including nursing shortages, increased patient acuity, and rapid admission-discharge cycles, have influenced management practices. Specifically, shifts for nurses have often increased from the traditional 8-hour rotation to 10–12 hours in length and often do not follow traditional patterns of day, evening, and night shifts.¹²² Noted across diverse safety-sensitive industries, work factors associated with increased risks for poor employee well-being and performance errors include the following:

- Shift work^{2,122}
- Rotating shifts and night shifts^{122,123}
- Extended work hours (more than 12 hours in a 24-hour period)^{2,124,125}
- Overtime^{124,126}
- Excessive workloads^{2,123,124}

Research on the effects of shift work, extended work hours, nighttime shifts, insufficient or nonexistent work breaks, inadequate rest between tours of duty, and heavy workloads

documents elevated risks. These work factors may be associated with outcomes for employee well-being and performance that include the following:

- Fatigue and exhaustion^{2,123–125,127,128}
- Sleep deprivation^{2,123,125,127}
- Slowed reaction time^{122,129}
- Lapses of attention to detail^{122,125,129}
- Compromised problem solving^{122,129}
- Occupational injuries^{2,122,125,126,128}
- Increased incidence of errors^{2,122,124–126}

3.5.1.1 Impact on Patients and Workers

Health Care Workers

Occupations that have extended shifts, especially in excess of 12.5 hours, rotating shifts, and high workloads are associated with health care worker fatigue and sleep deprivation. These in turn contribute to occupational injuries and accidents as well as performance errors.^{2,126,127} Fatigue is associated with cognitive, psychomotor, and behavioral impairment.¹²² Furthermore, sleep deprivation and fatigue may adversely affect nervous, cardiovascular, metabolic, and immune functioning.² In addition, overwhelming workload demands and the need for speed contribute to personnel taking shortcuts or using workarounds for patient care processes. In one study of 393 registered nurses, 14% of respondents reported working 16 or more consecutive hours at least once during the 4-week survey period with the longest reported shift lasting 23 hours and 40 minutes.¹²⁴ In addition to working longer than the scheduled hours, nurses often do not take meal or periodic rest breaks that might improve short-term performance and reduce fatigue.^{122,126,130} Even when taking breaks, nurses rarely relinquish patient care responsibilities totally.¹²⁷ Multiple reasons such as difficulty in handing off care responsibilities or fear of missing a return call from a doctor make nurses reluctant to take uninterrupted breaks.¹²⁷ Furthermore, organizational scheduling practices do not always allow time for recovery between shifts or follow a clockwise (forward) directional pattern (day–evening–night) that is easier to adjust to.¹²² Finally, the risk of needlestick and sharps injuries is significantly higher with extended-duration work shifts¹²⁵ and long work hours with physical demands increase the risk for work-related musculoskeletal injuries.¹³¹

Heavy workloads and inadequate staffing levels, increasing patient acuity levels, and unpredictable and often traumatic events all place emotional demands on staff and contribute to the risk of burnout, exhibited in symptoms

including depersonalization and emotional exhaustion.^{2,132} Burnout is known to be a significant factor in employee well-being, job satisfaction, and turnover and has also been associated with staff perceptions of a less safe environment and a lower incidence of near-miss error reporting.¹³³ Burnout and exhaustion may also place staff at greater risk for occupational injuries. Halbesleben found that “employee exhaustion was positively associated with the use safety workarounds, which were positively associated with occupational injuries.”^{128,(p.8)}

Like extended work shifts in nursing, traditional 24–30-hour on-call shifts for physicians-in-training have raised health and safety concerns for professionals and patients.^{125,126} Residents and interns working the traditional extended-hour schedule make more serious medical errors and experience increased risk for sharp injury and even motor vehicle accidents.^{125,126}

Patients

An association between health care worker fatigue, sleep deprivation, and patient safety has been explored in several studies. In one study, the physicians-in-training working traditional schedules (24–30 hours) made 36% more serious medical errors and five times as many serious diagnostic errors than those working limited hours.¹³⁴ Similarly, Rogers et al.¹²⁴ found the likelihood of making nursing errors was three times higher for nurses working shifts longer than 12.5 hours. More than half of the reported errors (58%) and near errors (56%) involved medication administration while other errors included procedural errors, charting errors, and transcription errors. Medication, procedural, and transcription errors all pose a risk for patient harm.

The shortage of critical health care workers, especially nurses, has contributed to the development of extended hour shifts, heavy workloads, and overtime. Time pressures created by a heavy workload can leave nurses with little or no time to double check procedures and may lead to dangerous workarounds—“alternative work processes undertaken to ‘work around’ a perceived block in work flow, such as a safety procedure.”¹²⁸ Retrospective studies have linked staffing hours below target levels with increased patient mortality.¹³⁵ An AHRQ evidence report meta analysis concluded that increased nurse staffing in hospitals was associated with lower mortality and failure to rescue, along with better outcomes in ICU and surgical patients.¹³⁶

3.5.1.2 Examples of Interventions

Regulations and Recommendations

Regulations and strategies to combat worker fatigue and associated adverse outcomes have been developed in other industries. For example, the National Transportation and Safety Board has adopted measures including limiting time on duty, mandating opportunities for sleep, and using controlled rest periods.¹³⁷ However, in health care, there are no universal measures in place across all states, health care settings, and professions. By contrast, as early as 1993, the European Union issued the European Working Time Directive that was implemented by law in 1998 in the United Kingdom.¹²⁶ This directive limits not only physicians-in-training but also nurses and senior physicians to a maximum of 13 consecutive hours of work and 48 hours of work per week.¹²⁶

While at this time there are no national regulations restricting the number of hours a nurse can voluntarily work, some states have passed laws prohibiting mandatory overtime.^{122,124} A number of states have introduced some version of safe RN staffing legislation aimed at addressing nurse/patient ratios, which have become a concern due to the impact of the nursing shortage.¹³⁸ Brief rest breaks and meal breaks are not mandated in the Code of Federal Regulations, and fewer than half the states have legislation providing workers the legal right to these breaks.¹²² However, evidence linking provider fatigue with occupational illness and injury as well as patient safety issues has generated research and recommendations on work hours, breaks, and scheduling. For example, evidence of the risks of lengthy work tours led to the development of Duty Hour Standards by the Accreditation Council for Graduate Medical Education (ACGME) in 2003.¹³⁹ At the request of Congress in 2007, the Institute of Medicine charged the Committee on Optimizing Graduate Medical Trainee (Resident) Hours and Work Schedules to evaluate available evidence and develop strategies to optimize work schedules.¹²³ The review led to recommendations that adjustments to the 2003 ACGME rules were needed. The committee noted that it is necessary to look beyond work hours to consider factors such as sufficient time for sleep, appropriate workload, and effective handovers of patient care.¹²³ The recommendations are designed to dovetail with an institutional culture of safety that reduces errors and enhances patient safety. The ACGME released rule revisions in July 2011, accompanied by new support features such as “Frequently Asked Questions.”¹³⁹ The ANA also

advocates that employers provide a work schedule that includes adequate rest and recuperation, sufficient staffing resources to foster a safe and healthful environment that encourages the elimination of excessive overtime, and shift rotations.¹²⁹ The Institute of Medicine has recommended that all nursing shifts greater than 12 hours be eliminated.¹²³ Studies of evidence-based intervention schedules have demonstrated the feasibility of implementing shorter tours of duty; however, adoption of evidence-based scheduling has lagged in the United States.

In an effort to reduce performance errors and occupational accidents and injuries, some safety-sensitive industries have developed and implemented measures such as hours of service regulations, appropriate scheduling practices, changes in workplace design and technology, and fatigue management research.¹²⁷ Fatigue risk-management systems represent a relatively new approach being applied in high reliability industries that addresses several areas, including management policy (such as limits on work hours); risk management; a reporting system for employee-related near-miss events; incident investigation; training for managers and workers; sleep disorder management; and corrective actions for continuous improvement.¹⁴⁰

Providing a framework of regulations is a good starting point. However, numerous employer and employee-generated interventions are needed to effectively achieve improved health and safety outcomes for workers and patients. Researchers have noted that success will require a change in culture, both institutional and professional. Adoption of evidence-based work schedules requires significant planning and adequate workforce resources. While evidence supports a recommendation that health care workers take uninterrupted periodic rest and regular meal breaks, implementation requires a change in the current cultural attitude that self-care should take a back seat to patient needs.¹²⁷ Old policies prohibiting an employee from napping while on duty still exist, and many organizations do not have designated places convenient to work assignments where employees can rest comfortably.¹²⁷ Employees must also address lifestyle changes that support restful, adequate, and uninterrupted sleep on a daily basis. Well-documented strategies such as planned naps; strategic use of caffeine; creating a quiet, dark, and designated area for sleep; turning off electronic devices; and so on fall to the employee to implement. Table 3-5 offers a few suggestions for organizational and personal interventions to reduce health and safety risks for health care workers and patients associated with workforce factors and working conditions.

Table 3-5: Workforce and Working Condition Interventions to Improve Worker Well-Being and Patient Safety

Professional and Educational Organizations and Agencies	Health Care Organization Management and Administration	Health Care Workers
Develop evidence-based work strategies and interventions to reduce risks to health care workers and patients by pursuing research priorities.*	Utilize the latest research on working conditions in safety-sensitive industries, especially health care.† Assess for fatigue-related risks. This includes an assessment of off-shift hours and consecutive shift work and a review of staffing and other relevant policies to ensure they address extended work shifts and hours.†‡§	Be aware of the work environment and voice safety concerns.¶
Pursue research recommendations as proposed by NORA in <i>State of the Sector Healthcare and Social Assistance</i> Chapter 5 “Work Organization and Work-Related Stress Disorders in the HCSA Sector. (See Reference List)*	Comply with established hours-of-service regulations. Eliminate mandatory overtime and monitor voluntary overtime practices. Work with staff nurses to develop flexible staffing strategies.¶§ Since patient hand-offs are a time of high risk—especially for fatigued staff—assess the organization’s hand-off processes and procedures to ensure that they adequately protect patients.¶§	Limit voluntary overtime to recommended hours of service per week. Evaluate impact of working multiple jobs on personal health and fatigue.¶** Recognize obligation to patient safety and personal health by declining assignments if impaired by fatigue.

Table 3-5: Workforce and Working Condition Interventions to Improve Worker Well-Being and Patient Safety (continued)

Professional and Educational Organizations and Agencies	Health Care Organization Management and Administration	Health Care Workers
Ensure professional curriculums educate students in the relationship between work-related fatigue, occupational injuries and work errors, and fatigue countermeasures.*	Create a partnership between occupational health, patient safety, human resources, and nursing administration to examine health and safety issues related to workplace conditions for both workers and patients.[†] Create and implement a fatigue management plan that includes scientific strategies for fighting fatigue.^{ll} These strategies can include: engaging in conversations with others (not just listening and nodding); doing something that involves physical action (even if it is just stretching); strategic caffeine consumption (don't use caffeine when you're already alert and avoid caffeine near bedtime); taking short naps (less than 45 minutes).^{#§} Educate staff about sleep hygiene and the effects of fatigue on patient safety.^{#ll§} Provide opportunities for staff to express concerns about fatigue. Support staff when appropriate concerns about fatigue are raised and take action to address those concerns.[§]	Recognize signs and symptoms of work-related fatigue, express concerns and seek assistance as necessary (for example, fatigue and stress management programs).^{†ll} Develop good personal sleep hygiene habits.[†] Implement recommended fatigue-management strategies when indicated.[#]
Courses on improving patient safety and quality of care could be offered jointly to students in schools from diverse disciplines (for example, nursing, pharmacy, medicine, allied health, health care management) to foster teamwork and shared responsibilities. ^{††}	Collect and analyze data to identify patterns on work hours for health care workers, as well as overtime, scheduling patterns, absenteeism, workers' compensation claims, turnover, and employee satisfaction; collect and analyze error reports and adverse events for patients. [†]	Contribute to organizational assessments by participating in research if available and completing staff surveys. [#]
Support evidence-based scheduling and hours of service regulations when available. ^{ll‡}	Conduct screening to detect workers who exhibit symptoms of sleep deprivation or work-related fatigue.[†] (See resource list for an example of a screening tool.) Provide all staff with education on the risks of work-related fatigue, signs and symptoms of sleep deprivation, and the importance of rest and meal breaks.^{†ll}	Work with organizational management to provide adequate physical space for staff rest breaks if not currently available and policy permits.[#] Take periodic rest breaks and uninterrupted meal breaks during shifts.[†]
Conduct research on creative staffing patterns to meet patient care needs and the well-being of nurses. ^{ll}	Adopt evidence-based scheduling practices for nurses and health care workers, for example, schedule in a clockwise (forward) direction.[†] Encourage teamwork as a strategy to support staff who work extended work shifts or hours and to protect patients from potential harm. For example, use a system of independent second checks for critical tasks or complex patients.^{ll§}	Participate in work groups and improvement initiatives to examine staffing and scheduling practices in your organization.

Table 3-5: Workforce and Working Condition Interventions to Improve Worker Well-Being and Patient Safety (continued)

Professional and Educational Organizations and Agencies	Health Care Organization Management and Administration	Health Care Workers
Conduct research on the application of fatigue countermeasures (such as checklists) developed in other safety-sensitive industries. [#]	Incorporate practices that promote high reliability and bridge patient and worker safety activities. Develop policies that support periodic rest and regular meal breaks by providing uninterrupted coverage of all responsibilities (including coverage of both admissions and all continuing care by another provider) and carrying pagers and phones. Remove policies that are in conflict with evidence-based recommendations for rest during work shifts.[#] Consider fatigue management, ergonomics, and human factors research related to workplace design and technology.^{#§}	Report unsafe working conditions.^{**} Maintain vigilance for safety risks and hazards. Share concerns and search out solutions. Comply with recommended practices to combat fatigue during work shifts, such as taking rest and meal breaks.^{#†}
Support research and development for, and dissemination of, evidence-based building design that supports patient and worker safety and health. [*]	Assess physical structure for ways to provide a cool, dark, quiet, comfortable room in close proximity to patient care assignments for staff rest breaks. If necessary, provide eye masks and earplugs. ^{#§}	Utilize designated dining and break facilities for meals and rest periods. ^{†‡}
Examine error and near-miss reporting systems developed in other safety-sensitive industries for adaptability to health care.	Encourage error and near error reporting as part of quality improvement efforts and to better understand the relationship between working conditions and patient safety. Consider fatigue as a potential contributing factor when reviewing all adverse events.	Participate in voluntary reporting of safety issues impacting staff and patients, near-miss and adverse safety events to expand the knowledge base, and provide learning opportunities.

Sources:

* US Department of Health and Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health [Internet]. State of the Sector | Healthcare and Social Assistance: Identification of Research Opportunities for the Next Decade of NORA. DHHS (NIOSH) Publication Number 2009-139. Available from: <http://www.cdc.gov/niosh/docs/2009-139>.

† Witkoski A, Dickson VV. Hospital staff nurses' work hours, meal periods, and rest breaks. A review from an occupational health nurse perspective. *AAOHN J*. 2010 Nov;58(11):489–497; quiz 498–499. doi: 10.3928/08910162-20101027-02. Review. PubMed PMID: 21053797.

‡ Page A, editor; Institute of Medicine. *Keeping Patients Safe: Transforming the Work Environment of Nurses*. Washington (DC): National Academies Press, 2004.

§ The Joint Commission [Internet]. Oakbrook Terrace (IL): The Joint Commission; c2012 [updated 2011 Dec 14; cited 2011 Dec 15]. Sentinel Event Alert Issue 48: Health care worker fatigue and patient safety; [about 4 p.]. Available from: http://www.jointcommission.org/sea_issue_48/.

|| Ellis JR [Internet]. Seattle (WA): Washington State Nurses Association; c2008 [updated 2008; cited 2012 Jan 30]. *Quality of Care, Nurses' Work Schedules, and Fatigue*; [about 24 p.]. Available from: <http://www.wsna.org/Topics/Fatigue/documents/Fatigue-White-Paper.pdf>.

Scott LD, Hofmeister N, Rogness N, Rogers AE. Implementing a fatigue countermeasures program for nurses: A focus group analysis. *J Nurs Adm*. 2010 May;40(5):233–240.

** American Nurses Association [Internet]. Washington (DC): American Nurses Publishing; c2006 [updated 2006 Dec 8; cited 2011 Nov 6]. *Assuring Patient Safety: Registered Nurses' Responsibility in All Roles and Settings to Guard Against Working When Fatigued* [about 6 p.]. Available from: <http://gm6.nursingworld.org/MainMenuCategories/Policy-Advocacy/Positions-and-Resolutions/ANAPositionStatements/Position-Statements-Alphabetically/Copy-of-AssuringPatientSafety-1.pdf>.

†† Buerhaus PJ, Donelan K, Ulrich BT, Norman L, DesRoches C, Dittus R. Impact of the nurse shortage on hospital patient care: Comparative perspectives. *Health Aff (Millwood)*. 2007 May-Jun;26(3):853–862.

Resources 3-8: Workforce Staffing and Fatigue

Title and Website	Description
Accreditation Council for Graduate Medical Education (ACGME)	
Standards Duty Hours http://www.acgme.org/acgmeweb/tabid/271/GraduateMedicalEducation/DutyHours.aspx	Standards for duty hours for the graduate medical trainee (residents)
Agency for Healthcare Research and Quality (AHRQ)	
Publication Patient Safety and Quality: An Evidence-Based Handbook for Nurses http://www.ahrq.gov/qual/nursesfdbk/	A comprehensive handbook for nurses on topics related to patient safety and quality of care; working conditions and the work environment are addressed.
American College of Occupational and Environmental Medicine (ACOEM)	
Guidance Statement Fatigue Risk Management in the Workplace Lerman SE, Eskin E, Flower DJ, George EC, Gerson B, Hartenbaum N, Hursh SR, Moore-Ede M. American College of Occupational and Environmental Medicine Presidential Task Force on Fatigue Risk Management. Fatigue risk management in the workplace. J Occup Environ Med. 2012 Feb;54(2):231-58. PubMed PMID: 22269988. http://www.acoem.org/uploadedFiles/Public_Affairs/Policies_And_Position_Statements/Fatigue%20Risk%20Management%20in%20the%20Workplace.pdf	This guidance statement by the ACOEM addresses fatigue as an unsafe condition in the workplace. The statement describes the benefits and activities associated with developing and implementing a fatigue risk management system in health care organizations.
American Nurses Association	
Position Paper Assuring Patient Safety: Registered Nurses' Responsibility in All Roles and Settings to Guard Against Working When Fatigued (2006) http://www.nursingworld.org/MainMenuCategories/Policy-Advocacy/Positions-and-Resolutions/ANAPositionStatements/Position-Statements-Alphabetically/Copy-of-AssuringPatientSafety-1.pdf	A position statement on the registered nurse's responsibility in the evaluation of his/her degree of fatigue when deciding to accept or reject any assignment extending beyond their regularly scheduled work day or week, including a mandatory or voluntary overtime assignment
Position Paper Assuring Patient Safety: The Employers' Role in Promoting Healthy Nursing Work Hours for Registered Nurses in All Roles and Settings (2006) http://www.nursingworld.org/MainMenuCategories/Policy-Advocacy/Positions-and-Resolutions/ANAPositionStatements/Position-Statements-Alphabetically/AssuringPatientSafety.pdf	A position statement addressing employer roles in the development of policies and procedures that promote healthy nursing work hours and patterns that do not extend beyond the limits of safety for both nurses and patients
Journal Article	
Occupational Fatigue Exhaustion Recovery Scale (OFER) Winwood PC, Lushington K, Winefield AH. 2006. Further development and validation of the Occupational and Fatigue Exhaustion Recovery (OFER) scale. J Occup Environ Med. 2006 Apr;48(4):381-389.	Article describes a tool for screening nurses at risk for work-related fatigue. It has three subscales to determine acute fatigue, chronic fatigue, and intershift recovery.

Resources 3-8: Workforce Staffing and Fatigue (continued)

Title and Website	Description
National Institute for Occupational Safety and Health	
Publication Overtime and Extended Work Shifts: Recent Findings on Illnesses, Injuries and Health Behaviors (2004) http://www.cdc.gov/niosh/docs/2004-143/pdfs/2004-143.pdf	This document summarizes scientific findings to date concerning the relationship between overtime and extended work shifts on worker health and safety
Report Caruso CC and Geiger-Brown J. Chapter 5: Work Organization and Work-Related Stress Disorders in the HCSA Sector In: US Department of Health and Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health [Internet]. State of the Sector Healthcare and Social Assistance: Identification of Research Opportunities for the Next Decade of NORA. DHHS (NIOSH) Publication Number 2009-139. Available from: http://www.cdc.gov/niosh/docs/2009-139	This 236-page document, developed by the NORA Healthcare and Social Assistance Sector Council, addresses the "state of the sector," including magnitude and consequences of known and emerging health and safety problems, critical research gaps, and research needs that should be addressed over the next decade of NORA. Chapter 5 discusses work organization and work-related stress disorders.
The Joint Commission	
Sentinel Event Alert Health Care Worker Fatigue and Patient Safety http://jointcommission.org/sea_issue_47/	An informational paper describing the impact of, and contributing factor to, worker fatigue. Actions are suggested that health care organizations can take to help mitigate the risks of fatigue resulting from extended work hours and potential adverse patient outcomes.

3.5.2 Work-Related Emotional Injuries and Illness

High reliability organizations are continuously aware of the possibility of failure and therefore promote transparency by encouraging all employees to report adverse safety events and near-miss events. Their emphasis is on system failures, not individual failures. However, for the health care professional involved in an adverse event, or even a near miss, it is a very personal experience. Errors and near errors as well as tragic patient outcomes such as deaths—unanticipated or not—trigger intense emotional responses in even the most experienced clinician.¹⁴¹ While growing attention has rightfully been focused on making system improvements to increase safety and supporting patients who are impacted by errors, equal consideration has not always been given to the health care professionals, including physicians, involved in adverse medical events.¹⁴²

Newer studies are contributing to a body of knowledge about, and understanding of, the emotional impact on professionals who have been referred to as “second victims.”^{141,143–145} The

term *second victim* was used by Dr. Albert Wu more than 10 years ago to describe the emotional distress experienced by physicians following a medical error.¹⁴⁶ The term is now often applied across professional disciplines to describe the personal impact of medical error, near error, and unanticipated clinical events (see Sidebar 3-10, page 118). In addition to developing a greater understanding of the impact on the health care worker, emerging research is examining the potential influence on future performance and quality of care. The issue is also receiving some attention in the public media, as in the 2010 *Reader's Digest* article “White Coat Confessions,” which shares real-life stories of medical errors and near errors from professionals who convey the feelings of guilt and emotional distress they suffer.¹⁴⁷

3.5.2.1 Impact on Patients and Workers

For decades a culture that has placed emphasis on individual performance and expectations that health professionals are “error-free”¹⁴³ has contributed to the fear of reporting errors, leaving second victims to suffer alone. Symptoms reported by second victims range widely from anxiety, depression,

Sidebar 3-10: Definition of Second Victim

"A second victim has been described as a health care provider involved in an unanticipated adverse patient event, medical error and/or a patient-related injury who becomes victimized in the sense that the provider is traumatized by the event. Frequently, second victims feel personally responsible for the unexpected patient outcomes and feel as though they have failed their patients, second-guessing their clinical skills and knowledge base."

Source: Scott SD, et al. Caring for our own: Deploying a systemwide second victim rapid response team. *Jt Comm J Qual Patient Saf.* 2010 May;36(5):233.

feelings of inadequacy or concerns about their ability to perform their jobs, to burnout and even thoughts of suicide.^{141,144,145} Second victims who do not receive support may experience emotional distress, loss of sleep, and difficulty concentrating, which may diminish future job performance.¹⁴³ Based on a review of the literature, Schwappach and Boluarte¹⁴⁵ suggest a reciprocal cycle of emotional distress, burnout, and increased risk of future error potentially impacting patient care (see Figure 3-1).

In addition to emotional injury, outcomes for health care professionals involved in recognized medical errors can include litigation and in a few instances have even resulted in criminal prosecution. Other tragedies have included job termination and even suicide, as was the case for Kimberly Hiatt (see Sidebar 3-11, page 119).

Patients can experience a range of physical outcomes from no negative impact to death as a result of medical errors and adverse safety events. They may also experience emotional injuries and financial trauma. In a review of literature, O'Connor et al.¹⁴⁸ noted that after learning about a safety incident, patients may feel sad, anxious, depressed, or traumatized. In addition, they fear further errors and harm. Although patients are increasingly encouraged to be a "partner in care," their perspective is not rou-

tinely elicited following a safety event.¹⁴⁹ Family members may feel guilty for not being able to protect their family member from harm.¹⁴⁸

The direct and indirect costs associated with adverse medical events are significant. Medical treatment costs for the patient may be compounded by extended length of stay and even possible litigation. Health care workers may have increased absenteeism, illness, and diminished job performance. However, constructive outcomes have been reported when the health care professional receives support and is not targeted for blame by the organization.

3.5.2.2 Examples of Interventions

A rapid response team for second victims developed at one academic health care system is described in Case Study 3-7, page 119. Attending quickly to the emotional needs of health care professionals involved in events benefits their recovery and ability to return to optimum job performance. Resources to support second victims may be available within an organization. For example, employee assistance programs and chaplain services may be utilized. Also, training can be provided to employees willing to be part of a peer support team.

Interventions to support the emotional needs of patients who have experienced an adverse safety event have been suggested. Developing patient-assisted incident reporting to enhance the organization's incident reporting system and obtain the patient's perspective can provide valuable infor-

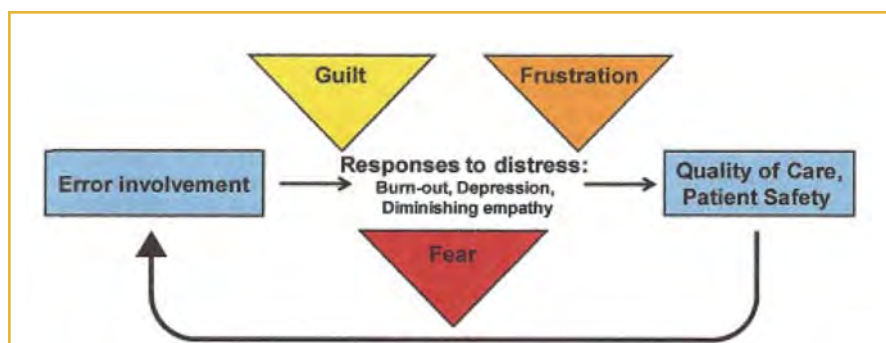


Figure 3-1: Reciprocal Cycle of Error Involvement, Emotional Distress, and Future Errors

Source: Schwappach DL, Boluarte TA. The emotional impact of medical error involvement on physicians: A call for leadership and organisational accountability. *Swiss Med Wkly.* 2009 Jan 10;139(1-2):9–15. Review. PubMed PMID: 18951201. Used with permission.

Sidebar 3-11: Kimberly Hiatt Story

This tragedy highlights the issues surrounding, and impact of, a medical error. There are two victims, patient and health care provider, involved in this serious medication error. Kimberly Hiatt, a veteran nurse with a 24-year career at one facility, acknowledged making an error resulting in the administration of an overdose of calcium chloride to a fragile baby. Hiatt immediately reported making the mistake to other staff and in the organization's electronic reporting system. Tragically, the baby who was critically ill, later died although it was not clear that the mistake could be identified as the cause. Her friends and family stated that Hiatt was devastated. In the aftermath of the error, she experienced intense media attention, job loss, and a licensure sanction from the state nursing commission and feared she would never be able to work as a nurse again. Ultimately, overcome with despair, she committed suicide six months after the mistake.

Adapted from source: Aleccia J. MSNBC Digital Network. New York: MSNBC; c2012 [updated 2011 Jun 27; cited 2012 Jan 18]. Nurse's suicide highlights twin tragedies of medical errors; [about 8 screens]. Available from: http://www.msnbc.msn.com/id/43529641/ns/health-health_care/t/nurses-suicide-highlights-twin-tragedies-medical-errors.

mation.¹⁴⁹ In fact, in postdischarge surveys, patients have reported safety incidents that occurred during their hospitalization that were not previously known.¹⁴⁹ Reports from patients may identify opportunities for safety improvements that were previously unrecognized. For example, eliciting a patient's detailed account of events surrounding a fall may uncover contributing factors not known to the caregiver, clarify educational needs, and increase patients' participation in their care. Good provider-patient communication has been reported to diminish the emotional trauma experienced by patients following a safety incident.¹⁴⁸

Patients who have experienced an adverse event need information to help them cope, such as an explanation of what happened, how and why it happened, how it will impact their health, and how future incidents might be prevented.¹⁴⁸ A majority of patients indicate that they want disclosure following an event. Disclosing safety incidents of which the patient is not aware is a complex issue. While health care professionals and patients support the concept of disclosing adverse events, there are identified barriers to disclosing as well as reasons for disclosure.¹⁴⁸ O'Connor et al.¹⁴⁸ present the issue in Table 3-6.

Sidebar 3-12: Value Added by Eliciting the Patient Perspective

- Improved understanding of an event's contributing factors and possible solutions or interventions
- Increased patient engagement in their care
- Opportunity to learn about other safety or quality concerns of the patient or family
- Opportunity to evaluate the patient's understanding of policies and educational materials

Source: Millman EA, et al. Patient-assisted incident reporting: Including the patient in patient safety. *J Patient Saf.* 2011 Jun;7(2):106-108. Used with permission.

What is clear is that as organizations continue to embrace a culture of safety, comprehensive approaches should be implemented that support patients *and* health care workers who are involved in unexpected clinical and adverse medical events. Each organization will need to ensure that management of safety events reflects core organizational safety values by protecting patients and providers both medically and emotionally.

Concern over the emotional trauma experienced by staff following unanticipated clinical events and its impact on employee well-being and patient safety was the impetus for development of a rapid response intervention at the University of Missouri health care system. The program, grounded in internal research, is described in Case Study 3-7.

CASE STUDY 3-7: UNIVERSITY OF MISSOURI: CARING FOR OUR OWN: CLINICIAN SUPPORT FOLLOWING UNANTICIPATED CLINICAL EVENTS

A Second Victim Rapid Response Program University of Missouri Health Care

A Second Victim Rapid Response Program

University of Missouri Health Care (MU Health Care) is an academic health care system that includes six facilities with approximately 5,300 faculty, staff, students, and volunteers. In 1998 MU Health Care designated the Office of Clinical Effectiveness (OCE) to oversee clinical outcomes and a

Table 3-6: Reasons to Disclose and Barriers to Disclosure of Adverse Events

Reasons to Disclose Adverse Events	Barriers to Disclosure of Adverse Events
Patients have a right to know what has happened to them, providing an ethical imperative to disclose adverse events.	Concerns over increased litigation costs
Disclosure is essential to allow consent for ongoing care.	Fear of loss of relationship with the patient
Good communication around an adverse event strengthens physician-patient relationship.	Fear of loss of reputation or damage to career progression
Later discovery of an adverse event that has not been disclosed is damaging to the physician-patient relationship.	Lack of institutional support
Disclosure can provide an opportunity for forgiveness and reconciliation after an adverse event.	Absence of training in how to go about disclosure conversations
Good disclosure practice makes effective reporting and learning more likely.	The emotional impact of adverse events on clinicians
Disclosure allows for just compensation to be sought following an adverse event.	
Disclosure may reduce the likelihood of litigation following an adverse event.	

Source: O'Connor E, Coates HM, Yardley IE, Wu AW. Disclosure of patient safety incidents: A comprehensive review. *Int J Qual Health Care*. 2010 Oct;22(5):371–379. PubMed PMID: 20709703. Used with permission.

transformation of the safety culture.* The OCE's work included the development and implementation of an electronic patient safety reporting system, coordination of safety investigations, and management of root cause analyses for the system. Safety event investigations revealed that in the aftermath of patient safety and unanticipated clinical events, clinicians were sometimes experiencing significant professional and personal distress. It was recognized that events such as patient deaths, even when expected due to terminal illness, and caring for very young patients could produce suffering among staff. Additionally, traumatic events experienced by coworkers or their family members sometimes produced distress. A growing awareness of this important staff health and well-being issue led Susan D. Scott, RN, MSN, patient safety officer at MU Health Care, and doctoral student at the MU Sinclair School of Nursing, to elevate the issue to senior management. Executive leaders responded by commissioning an interprofessional team to design a support strategy to explore what is increasingly being recognized throughout the health care community as "the second victim phenomenon." The team was composed of representatives from patient safety, risk management, physicians,

nursing staff, managers, and clergy, among others. A three-year research effort followed that included program planning, design, testing, and specialized training. It culminated in the deployment of MU Health Care's second victim rapid response team, *forYOU*. The term *second victim* has been described as a "health care provider involved in an unanticipated adverse patient event, medical error and/or a patient-related injury who become victimized in the sense that the provider is traumatized by the event. Frequently, second victims feel personally responsible for the unexpected patient outcomes and feel as though they have failed their patients, second-guessing their clinical skills and knowledge base."*

Designing a Rapid Response Program for Second Victims

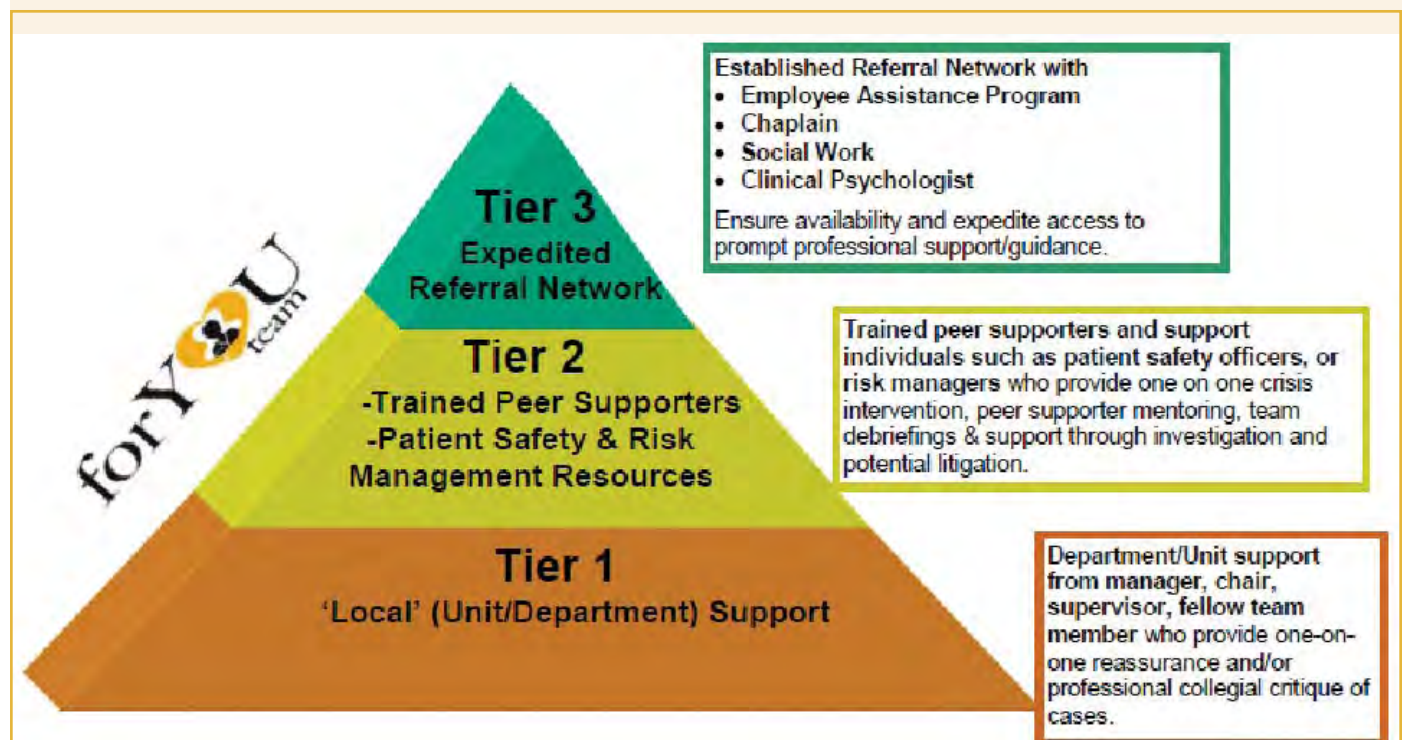
The second victim rapid response program at MU Health Care supports health care clinicians and staff members, because anyone who is involved with patient care could experience an unexpected clinical event or other emotional trauma and thereby become second victims. After studying the literature and several other peer support programs, the team conducted surveys of employees to understand the

frequency and nature of the second victim experience at MU Health Care. Surveys were completed by 898 employees across six facilities and from four professional groups. Approximately 30% (269/898) reported experiencing problems ranging from anxiety to questioning their job performance abilities as a result of some kind of event within the past 12 months. Survey results also suggested desirable organizational support structures and workplace interventions. Common narrative themes emerged, and foremost among these was “to implement an institutionally sanctioned respite away from the care environment immediately after an event to allow the second victim to compose himself/herself before resuming patient care.”* The narrative experiences provided by respondents, together with suggestions for supportive interventions, were formalized in the Scott Three-Tiered Interventional Model of Second Victim Support (see Figure 3-6). Based on the survey results and the team’s research, senior leaders strongly supported the deployment of a rapid response team for second victims to provide on-demand emotional support as described in the model. In summary,

the research phase defined what a second victim is, identified multiple recovery stages and related support needs, and led to the formulation of a three-tiered interventional strategy.

Implementing the *forYOU* Team

Three executive champions (the chief operating officer/chief nurse executive, the chief quality officer, and the chief medical officer) ensure that resources are available for staff training, education, team infrastructure, and ongoing team development and evolution. In March 2009, the rapid response *forYOU* Team was officially deployed to serve all six MU Health Care facilities. The guiding principle of the team is the understanding that the three-tiered model is used to facilitate the second victim’s progression through the stages of recovery according to their unique needs. Team training initially included 18 hours of didactics, small-group work, and simulation.* Team members received education on a wide range of topics, from basic second victim responses to the stages of



Case Study Figure 3-6: Scott Three-Tiered Interventional Model of Second Victim Support

Source: Scott SD, et al. Caring for our own: Deploying a systemwide second victim rapid response team. Joint Commission Journal on Quality and Patient Safety. 2010;36(5):233–240. Used with permission.

recovery, as well as active listening skills, stress management techniques, referral procedures, and more. Currently, the 84 team members, considered “clinical life-guards,” work in high risk clinical areas (for example, operating rooms, intensive care units, emergency department, and palliative care services) and high risk clinical teams (such as rapid response and code blue) across all shifts. There is a single individual responsible for system-wide team administration; however, each facility has a team leader who coordinates all program components and team members within that institution. One of the leaders is on call by pager 24/7 with a goal of ensuring that any health care provider or staff member suffering from a second victim experience receives psychosocial support before leaving the facility. Immediate intervention and support provided by supervisors and peers is supplemented by team members and can be further enhanced by expedited referral to internal professional counseling services as necessary.

Evaluating the Impact of the *forYOU* Team

Tier 1 interventions provide basic care and support by peers and supervisors but are not captured in formal system tracking. Attempts to monitor are focused on capturing Tier 2 and Tier 3 interventions. Data gathered during the first two years of program implementation reveal that a total of 375 individual clinicians have been served by the second victim rapid response team. Nursing personnel represented 58% of these individuals, 24% were medical staff, and 18% were allied health care personnel.* Reasons for activating the team included unexpected patient outcomes (54%), unit- or staff-related issues (30%), and medical errors (16%). Other measures targeted to assess program impact are staff turnover and vacancy rates. Items added to MU Health Care’s AHRQ modified patient safety culture survey in 2007 will be compared with 2009 (program implementation) and subsequent surveys. Substantial staff recruitment and training cost savings may be realized if a clinician receives support and remains in his or her position after an event rather than leaving. Finally, anecdotal feedback suggests that the program has been extremely helpful to second victims. Sample comments such as the following confirm the program’s impact on a personal level:

“To have someone call me out of the blue, just to offer support, was a wonderful thing! It was like a burden was lifted off of me, knowing I didn’t have to get through it alone.”—MD, second victim

“Helping with the team de-briefing was one of the most satisfying things that I have done during my tenure here. It was so fulfilling to help others in such a unique way. It made me feel really, really good.”

—Social Worker, peer supporter

Ongoing program improvement and assessment, as well as future descriptive research is planned. Recently a 10-module toolkit was made available to health organizations to develop and implement a second victim support system.†

Key Lessons for a Successful Second Victim Rapid Response System

To ensure that a second victim rapid response system can successfully be implemented, the following key elements and recommendations are presented:

1. *Supportive leadership and a sophisticated safety culture.*
The health care system with a strong culture of safety immediately responds not only to support patients and family members but also clinicians.
2. *A comprehensive support network for clinicians.* Support requires engaged leadership, preparedness, and a strong infrastructure for clinician support.
3. *Institutional awareness of the second victim phenomenon.*
There must be a comprehensive education and marketing plan to address three distinct groups within a health care facility. Plans should include the following factors:
 - a. All clinicians know about the second victim experience, what institutional response to anticipate, and how to aid their colleagues/peers.
 - b. Supervisory training is provided so that leaders are familiar with the second victim phenomenon and the strategies/key messages that clinicians and staff members need during this stressful period.
 - c. An education plan is in place for peer supporters to provide in-depth information about the second victim experience, strategic support interventions, and how to access additional assistance.
4. *A formal institutional response plan for addressing the period of time immediately following an unanticipated clinical event that also meets the unique needs of the second victim.* The three-tier emotional support structure was developed to ensure that a multitude of needs could be met.
5. *24/7 immediate access to provide support and guidance for a second victim or for a member of the rapid response team who needs additional guidance/assistance with a particularly difficult case.* Health care organizations frequently have internal resources available, such as chaplains, social

workers, and clinical health psychologists, as well as access to employee assistance programs (EAP). The referral process must be clearly defined to ensure that the second victim's personal and professional needs are satisfactorily addressed in a timely and expedited manner.

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Additional Resources

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Resources 3-9: Work-Related Emotional Injury

Title and Website	Description
GE Health Care	
Webcast The Second Victim Live video and transcript available at: http://nextlevel.gehealthcare.com/videos/webcasts/the-second-victim.php	A webcast featuring Dr. Albert Wu (Johns Hopkins University) and Jim Conway (Harvard School of Public Health) discussing what a successful second victim support program is, how to measure success, how leaders can create a culture that supports second victims, and how to plan a response to an adverse event
Institute for Healthcare Improvement (IHI)	
White Paper Respectful Management of Serious Clinical Adverse Events http://www.ihl.org/knowledge/pages/IHIwhitepapers/respectfulmanagementseriousclinicalAESwhitepaper.aspx	This white paper introduces an overall approach and tools designed to support two processes: (1) The proactive preparation of a plan for managing serious clinical adverse events; and (2) the reactive emergency response of an organization that has no such plan
International Critical Incident Stress Foundation	
Courses and Training Seminars http://www.icisf.org	A resource for education, training, consultation, and support services. Courses offered in crisis intervention.
Medically Induced Trauma Support Services (MITSS)	
Tools and Information Nonprofit organization http://www.mitss.org http://www.mitsstools.org	Tools and information to support patients, families, and clinicians impacted by medical errors and adverse medical events
The Joint Commission	
The Joint Commission Journal on Quality and Patient Safety Tool Tutorial Pratt S, Kenney L, Scott SD, Wu AW. How to Develop a Second Victim Support Program: A Toolkit for Health Care Organizations. The Joint Commission Journal on Quality and Patient Safety. 2012;38(5):235–240.	This article describes the development of a set of tools designed to assist health care organizations in developing and implementing a second victim support system

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– Chapter 4 –

Patient and Worker Safety Synergies— Key Themes and Action Steps to Meet Challenges and Achieve Success

This monograph presents material intended to raise the reader's awareness of the common health and safety risks shared by patients and workers in health care. Through literature references and links to resources, readers can learn more about the synergies between worker and patient safety in specific topic areas and about making safety a core organizational value, which is characteristic of highly reliable industries. The case studies from organizations that have implemented integrated patient and worker safety initiatives highlight valuable experiences. This chapter summarizes the key points, recommendations, and action steps identified during a vigorous day of discussions at the project roundtable meeting in July 2011, as well as those identified from the collaborating organizations and from the literature.

Regardless of the specific safety risk, implementing a framework of high reliability coupled with the use of supporting strategies will help organizations adopt a culture of safety that transcends individual improvement initiatives and departmental walls. Recommendations for successfully integrating patient and worker safety identified at the roundtable meeting, together with common strategies and action steps covered in this monograph are summarized in Sidebar 4-1, page 132.

4.1 Future Research and Activities

Since 1996, the National Institute for Occupational Safety and Health (NIOSH) implemented a partnership

Sidebar 4-1: Themes, Recommendations, and Action Steps from the Roundtable Meeting and Chapters

The roundtable meeting produced a wealth of recommendations for successfully integrating patient and worker safety. The recommendations are described here, together with common strategies and action steps covered in this monograph.

Encourage leaders to make patient and worker safety a core organizational value.

- Establish a vision that makes safety for both patients and workers a core value across the entire organization.
- Establish specific goals and incorporate plans to communicate and achieve the goals into strategic planning activities.
- “Walk the talk.” Become highly visible by making safety rounds at the unit and department level to actively engage with frontline staff.
- Communicate daily with all levels of management to learn about safety events through vehicles such as a “daily huddle.”
- Employ real-life patient and worker stories to engage the “hearts and minds” of leaders, managers, and staff.
- Engage board members in discussions of safety for both workers and patients. Share data on organizational performance.
- Communicate successes both internally and externally to the community through media and to peers through conferences, and so on.

Identify opportunities to integrate patient and worker safety activities across departments and programs.

- Build and raise awareness of linkages and cross-cutting topic areas.
- Recognize shared health and safety risks between health care staff and patients.
- Align patient and worker safety improvement initiatives having common goals. Consider integrating with organizational quality improvement priorities.
- Convene multidisciplinary safety committees that include representation from patient safety, employee health, occupational/environmental safety and health, infection prevention, risk management, human resources, and other areas.
- Examine policies for their impact (positive or negative) and unintended consequences on worker and patient safety.

- Remove structural and functional organizational systems and processes that maintain traditional “silos” for patient and worker health and safety.
- Develop a business case for integrating patient and worker safety initiatives; calculate a cost-benefit analysis or return on investment for specific initiatives.

Understand and measure performance on safety-related issues.

- Learn about evidence-based practices from published literature, conferences, networking, and other sources. Information sources should cross multiple disciplines. Incorporate and tailor relevant practices to your setting. Address obstacles and lessons learned by others in the field.
- Understand your risks based on facts—not perception. Gather baseline data on your current safety performance for benchmarking future performance. Monitor performance over time.
- Conduct periodic hazard analyses.
- Examine data from manual and automated employee and patient incident reporting systems (for example, work-related injury and illness incidence reports, hazard inspections, environmental hazards, patient safety incidents, medication errors, infection prevention), as well as quality improvement and performance measurement systems (internal and external) and human resources information (such as satisfaction surveys, turnover, absenteeism) to identify patterns and trends.
- Develop and improve nonpunitive incident reporting systems and encourage reporting for safety incidents, hazards, errors, and near misses.
- Investigate worker and patient safety events, errors, and near misses using root cause and other analysis tools to understand and identify contributing factors.

Implement and maintain successful worker and patient safety improvement initiatives.

- Develop a work plan, time line, staff accountabilities, and measures of success.
- Begin with small-scale changes to demonstrate success, then spread to other areas as enthusiasm builds.
- Develop employee training curricula and educational resources. Implement initial and regular training for new and existing staff. Enhance traditional educational methods with experiential, simulation, and scenario training.
- Redesign processes and systems based on identification of root causes and contributing factors to prevent future events.
- Integrate changes into existing process and procedures when possible.

- Identify and develop frontline worker “champions” who support and guide employees and promote the initiative’s success.
- Use visual, auditory, and electronic reminders to keep staff engaged.
- Provide regular feedback on overall and unit-level safety to staff.
- Post progress as visible recognition of success (for example, posters, intranet systems)
- Recognize and reward employee efforts to improve patient and worker safety.

program called the National Occupational Research Agenda to stimulate innovative research and improved workplace practices in occupational safety and health. Subsequently, NIOSH and its partners formed 10 Sector Councils aligned to major industry groups including Healthcare and Social Assistance (HCSA). The Sector Councils developed industry-specific research agendas for the nation. Prior to developing its research agenda, the Healthcare and Social Assistance Sector Council had developed a compendium (<http://www.cdc.gov/niosh/docs/2009-139/>) comprising reviews of topic-specific chapters on known evidence, emerging issues, knowledge gaps, and research needs. This “state of the sector” compendium was used to develop the HCSA research agenda and also served as a primary source of information for this monograph. Intended to be ever-green, the HCSA research agenda can be found at <http://www.cdc.gov/niosh/programs/hcsa/goals.html>.

In the course of developing this monograph, a number of research opportunities were also identified. Overall, we found there was very little empirical research on the synergies between patient and worker safety and a dearth of rigorous studies upon which an evidence base could be established. The opportunities to examine current safety practices, safety culture, organization performance, and patient and worker outcomes are vast and evolving. Examples of research topic areas and future activities that would help build consensus around the value of integrating patient and worker safety are listed in Sidebar 4-2, page 134.

Federal funding for research in this area has typically been provided by two disparate agencies. NIOSH, a part of the Centers for Disease Control, is the federal agency responsible for conducting research and making recommendations for the prevention of work-related injury and illness. The Agency for Healthcare Research and Quality (AHRQ), with

its mission to improve the quality, safety, efficiency, and effectiveness of health care for all Americans, supports research that helps people make more informed decisions and improves the quality of health care services. AHRQ has supported several large initiatives examining safety culture, work environment, and patient outcomes. The interdisciplinary nature of the safety research described in this monograph suggests the need for interagency collaboration and public-private partnerships to support research efforts to advance the evidence base for improving safety for both patients and workers.

4.2 Conclusion

The purpose of this monograph is to stimulate greater awareness of the potential synergies between patient and worker health and safety activities. Toward that end, we have presented a wide range of case examples, tools, techniques, and resources for further information on topic areas that are common across patient and worker safety.

It is worthwhile to review a few of the key points and lessons that can be drawn overall from the monograph. The growing evidence that employee well-being affects patient safety, both directly and indirectly, suggests that healthcare organizations striving for high reliability should be concerned with safety for both patients and workers. Leaders determine the extent to which the organization has a strong safety culture and positive work environment. There are numerous topic areas and examples of improvement interventions that can simultaneously benefit patients, employees, and the health care organization as a whole. These improvements can be applied not only in hospitals but also in home care, nursing homes, behavioral health, and several other settings.

Opportunities for functional synergies and collaboration on patient and worker safety exist in the areas of adverse event and hazard surveillance, reporting, analysis, and feedback; safety management systems; human factors and ergonomics; safer design of work processes and the built environment; and strategies to enhance communication and support staff engagement in improvement activities. The case examples describe challenges and strategies for overcoming obstacles in the areas of bariatric safe patient handling, fall prevention, violence prevention and mitigation, clinician support following unanticipated clinical events, as well as more general topics such as improving the civility of staff interactions, perceptions of safety, and moving toward becoming a high reliability organization.

This monograph represents only a starting point for what should become an ongoing effort to further our understanding of the value, benefits, and challenges of an integrated approach to patient and worker safety. Through

research, practical experience, and sharing of information, we will learn how best to prevent adverse events, reduce harm, and improve outcomes for all.

Sidebar 4-2: Research Opportunities to Help Integrate Patient and Worker Safety

Examples of research topic areas and future activities that would help build consensus around the value of integrating patient and worker safety include the following:

- Studies of the relationships between patient and worker safety and health risks and outcomes
- Development of evidence-based guidelines or practice recommendations on the impact of worker safety on patient and worker outcomes through systematic literature review, expert consensus panels, and research conferences
- Demonstrations of return on investment for integrated patient and worker safety initiatives
- Development of improved safety and injury surveillance systems, with alerts that help identify patient and occupational safety events across health care settings
- Assessment of the value of nonpunitive error and near-miss reporting within organizations and at the national level to identify causes and contributing factors
- Exploration of commonalities and effective strategies for measurement of patient and worker safety culture and worker and patient satisfaction in health care organizations
- Studies of workforce staffing practices (for example, shift length, shift rotation, overtime, staff skill mix, and coverage) and their relationship to health and safety outcomes for workers and patients

- Evaluation of benefits and effectiveness of mechanical lifting devices in preventing worker MSDs and patient injuries outside the hospital setting
- Identification of hazard elimination options for safety risks (for example, patient lifting and transfer, sharps injuries, injuries related to slips, trips, and falls)
- Effectiveness of facility design approaches that reduce safety risks and promote a healthy work environment (for example, reduction of slips, trips, and falls; strategic placement of hand hygiene stations; appropriate lighting and ventilation)
- Development of a toolkit to support integration of worker and patient safety practice within health care organizations
- Development of standardized metrics or performance measures useful in assessing the effectiveness of interventions and assessing outcomes for integrated improvement efforts both within and across organizations
- Implementation of a centralized resource site or portal to collect and share ideas and best practices among health care organizations and other stakeholders
- Development of methodologies to share data between health care organizations and external agencies
- Consensus on standardized definitions and data elements for common terms (for example, falls, assaults) that can be used for patient and worker incident reporting
- Implementation of learning collaboratives for patient-worker safety synergies

– Appendix A –

OSHA Topics Matched to Joint Commission Standards

January 2012

Note: Standards are from Joint Commission's Comprehensive Accreditation Manual for Hospitals, 2012 edition. Those labeled **EC** refer to the Environment of Care chapter; **IC** refer to the Infection Prevention and Control chapter; **IM** refer to the Information Management chapter; **LD** refer to the Leadership chapter; **LS** refer to the Life Safety chapter; **MM** refer to the Medication Management chapter; **PI** refer to the Performance Improvement chapter.

OSHA Topics Matched to Joint Commission Standards January 2012	
OSHA Topics	Joint Commission Standards
Voluntary Protection Program (VPP)	HR.01.01.01 The hospital has the necessary staff to support the care, treatment, and services it provides.
	HR.01.06.01 Staff are competent to perform their responsibilities.
	EC.03.01.01 Staff and licensed independent practitioners are familiar with their roles and responsibilities relative to the environment of care.
	PI.01.01.01 The hospital collects data to monitor its performance.
	PI.02.01.01 The hospital compiles and analyzes data.
	PI.03.01.01 The hospital improves performance on an ongoing basis.
	EC.04.01.01 The hospital collects information to monitor conditions in the environment.
	EC.04.01.03 The hospital analyzes identified environment of care issues.
	EC.04.01.05 The hospital improves its environment of care.
	LD.03.01.01 Leaders create and maintain a culture of safety and quality throughout the hospital.
	LD.03.02.01 The hospital uses data and information to guide decisions and to understand variation in the performance of processes supporting safety and quality.
	LD.03.03.01 Leaders use hospitalwide planning to establish structures and processes that focus on safety and quality.
	LD.03.04.01 The hospital communicates information related to safety and quality to those who need it, including staff, licensed independent practitioners, patients, families, and external interested parties.
	LD.03.05.01 Leaders implement changes in existing processes to improve the performance of the hospital.
	LD.03.06.01 Those who work in the hospital are focused on improving safety and quality.

OSHA Topics Matched to Joint Commission Standards January 2012

OSHA Topics	Joint Commission Standards	
Bloodborne pathogens, TB	IC.02.01.01	The hospital implements its infection prevention and control plan.
	IC.02.03.01	The hospital works to prevent the transmission of infectious disease among patients, licensed independent practitioners, and staff.
Ventilation	EC.02.05.01	The hospital manages risks associated with its utility systems.
	EC.02.05.05	The hospital inspects, tests, and maintains utility systems.
	EC.02.02.01	The hospital manages risks related to hazardous materials and waste.
	EC.02.06.05	The hospital manages its environment during demolition, renovation, or new construction to reduce risk to those in the organization.
Information management	IM entire chapter	
	EC.04.01.01	The hospital collects information to monitor conditions in the environment.
	EC.04.01.03	The hospital analyzes identified environment of care issues.
	PI.01.01.01	The hospital collects data to monitor its performance.
	PI.02.01.01	The hospital compiles and analyzes data.
	LD.03.02.01	The hospital uses data and information to guide decisions and to understand variation in the performance of processes supporting safety and quality.
Patient handling, lifting, and moving	EC.03.01.01	Staff and licensed independent practitioners are familiar with their roles and responsibilities relative to the environment of care.
	EC.04.01.01	The hospital collects information to monitor conditions in the environment.
	EC.04.01.03	The hospital analyzes identified environment of care issues.
Safety and health programs	EC.02.01.01	The hospital manages safety and security risks.
	EC.03.01.01	Staff and licensed independent practitioners are familiar with their roles and responsibilities relative to the environment of care.
	EC.04.01.01	The hospital collects information to monitor conditions in the environment.
	EC.04.01.03	The hospital analyzes identified environment of care issues.
	EC.04.01.05	The hospital improves its environment of care.
Workplace violence	EC.02.01.01	The hospital manages safety and security risks.
	EC.03.01.01	Staff and licensed independent practitioners are familiar with their roles and responsibilities relative to the environment of care.
Hazardous drugs, reproductive hazards, and anesthetic gases	EC.02.02.01	The hospital manages risks related to hazardous materials and waste.
	MM.01.01.03	The hospital safely manages high-alert and hazardous medications.

OSHA Topics Matched to Joint Commission Standards January 2012		
OSHA Topics	Joint Commission Standards	
Laboratory and hazard communication	EC.02.02.01	The hospital manages risks related to hazardous materials and waste.
	EC.03.01.01	Staff and licensed independent practitioners are familiar with their roles and responsibilities relative to the environment of care.
Ethylene oxide, formaldehyde, glutaraldehyde, nitrous oxide, and other hazardous vapors, including those vapors generated while using cauterizing equipment and laser	EC.02.02.01	The hospital manages risks related to hazardous materials and waste.
	EC.02.04.03	The hospital inspects, tests, and maintains medical equipment.
	EC.02.05.01	The hospital manages risks associated with its utility systems.
	EC.02.05.05	The hospital inspects, tests, and maintains utility systems.
OSHA record keeping	EC.04.01.01	The hospital collects information to monitor conditions in the environment.
	EC.02.02.01	The hospital manages risks related to hazardous materials and waste.
Walking and working surfaces	EC.02.01.01	The hospital manages safety and security risks.
	EC.04.01.01	The hospital collects information to monitor conditions in the environment.
	EC.04.01.03	The hospital analyzes identified environment of care issues.
	EC.04.01.05	The hospital improves its environment of care.
Fire safety	EC.02.03.01	The hospital manages fire risks.
	EC.02.03.03	The hospital conducts fire drills.
	EC.02.03.05	The hospital maintains fire safety equipment and fire safety building features.
	LS.01.02.01	The hospital protects occupants during periods when the <i>Life Safety Code</i> is not met or during periods of construction.
Electrical safety	EC.02.05.01	The hospital manages risks associated with its utility systems.
	EC.03.01.01	Staff and licensed independent practitioners are familiar with their roles and responsibilities relative to the environment of care.
Education/professional qualifications of parties responsible for the safety and health program	HR.01.02.01	The hospital defines staff qualifications.
	HR.01.02.05	The hospital verifies staff qualifications.
	HR.01.05.03	Staff participate in ongoing education and training.
	HR.01.06.01	Staff are competent to perform their responsibilities.
	EC.03.01.01	Staff and licensed independent practitioners are familiar with their roles and responsibilities relative to the environment of care.
Safety and health statistics MSDS and OSHA 300 log	EC.04.01.01	The hospital collects information to monitor conditions in the environment.
	EC.04.01.03	The hospital analyzes identified environment of care issues.

– Appendix B –

Glossary of Terms

Abuse: Intentional mistreatment that may cause either physical or psychological injury. See also *mental abuse*, *physical abuse*, and *sexual abuse*.

American National Standards Institute

(ANSI): A privately funded voluntary membership organization that develops consensus standards nationally for a wide variety of devices and procedures.¹

Behavioral health care: A broad array of care, treatment, or services for individuals with mental health issues or problems, foster care needs, addictive behaviors, chemical dependency issues, or intellectual disabilities. Care, treatment, or services can be provided in a wide variety of settings, such as inpatient/crisis stabilization, residential, day program, and outpatient settings.

Behaviors that undermine a culture of safety: Conduct by staff working in the organization that intimidates others to the extent that quality and safety could be compromised. These behaviors, as determined by the organization, may be verbal or nonverbal, may involve the use of rude language, may be threatening, or may involve physical contact.

Best practices: Clinical, scientific, or professional practices that are recognized by a majority of professionals in a particular field. These practices are typically evidence based and consensus driven.

Biohazard: A combination of the words *biological* and *hazard*; organisms or products of organisms that present a risk to humans.¹

Bloodborne pathogens: Pathogenic microorganisms that may be present in human blood and can

cause disease in humans. These pathogens include but are not limited to hepatitis B virus (HBV), hepatitis C virus (HCV), and human immunodeficiency virus (HIV).²

Bureau of Labor Statistics (BLS): The Bureau of Labor Statistics of the U.S. Department of Labor is the principal Federal agency responsible for measuring labor market activity, working conditions, and price changes in the economy. Its mission is to collect, analyze, and disseminate essential economic information to support public and private decision-making. As an independent statistical agency, BLS serves its diverse user communities by providing products and services that are objective, timely, accurate, and relevant. (<http://www.bls.gov/bls/infhome.htm>)

Carcinogen: A substance or agent capable of causing or producing cancer in mammals, including humans. A chemical is considered to be a carcinogen if: (a) it has been evaluated by the International Agency for Research on Cancer (IARC) and found to be a carcinogen or potential carcinogen; or (b) it is listed as a carcinogen or potential carcinogen in the Annual Report on Carcinogens published by the National Toxicology Program (NTP) (latest edition); or (c) it is regulated by OSHA as a carcinogen.¹

Clinical practice guidelines: Tools that describe a specific procedure or processes found, through clinical trials or consensus opinion of experts, to be the most effective in evaluating and/or treating a patient, resident, or individual served who has a specific symptom, condition, or diagnosis. Synonyms include *practice parameter*, *protocol*, *clinical practice recommendations*, *preferred practice pattern*, and *guideline*.

Close call (or “near miss”): Any process variation that did not affect an outcome but for which a recurrence carries a significant chance of a serious adverse outcome. Such events fall within the scope of the definition of a sentinel event but outside the scope of those sentinel events that are subject to review by The Joint Commission under its Sentinel Event Policy.

Continuity: The degree to which the care of individuals is coordinated among health care professionals, among organizations, and over time.

Culture of safety: Characterized by open and respectful communication among all members of the health care team in order to provide safe patient care. It is a culture that supports “organizational commitment to continually seeking to improve safety.”³

Days away, restricted, or transferred (DART): A calculation based on $(N \times EH) \times (200,000)$, where N is the number of cases involving days away and/or restricted work activity and/or job transfer; EH is the total number of hours worked by all employees during the calendar year; and 200,000 is the base number of hours worked for 100 full-time equivalent employees.⁴

Disruptive behavior: Behavior that interferes with effective communication among health care providers and negatively impacts performance and outcomes. Behavior that is not supportive of a culture of safety.⁵

Environmental tours: Activities routinely used by the organization to determine the presence of unsafe conditions and whether the organization’s current processes for managing environmental safety risks are practiced correctly and are effective.

Epidemic: A disease, such as influenza, that spreads rapidly, attacks many people in a geographic area, causes a high rate of morbidity or mortality, and then subsides. *Epidemic* applies especially to infectious diseases, as in an epidemic of cholera, but it is also applied to any disease, injury, or other health-related event, such as an epidemic of teenage suicide.

Equipment management: Activities selected and implemented by the organization to assess and control the clinical and physical risks of fixed and portable equipment used for diagnosis, treatment, monitoring, and care.

Fear eliciting: Intentionally causing undue fear, fright, panic, or terror in order to obtain compliance by the individual.

Fire-safety management: Activities selected and implemented by the organization to assess and control the risks of fire, smoke, and other byproducts of combustion that could occur during the organization’s provision of care, treatment, or services.

Hazard: A source of risk that does not necessarily imply potential for occurrence. A hazard produces risk only if an exposure pathway exists and if exposures create the possibility of adverse consequences.⁶

Hazardous materials and waste: Materials whose handling, use, and storage are guided or defined by local, state, or federal regulation, such as OSHA’s Regulations for Bloodborne Pathogens regarding the disposal of blood and blood-soaked items and the Nuclear Regulatory Commission’s regulations for the handling and disposal of radioactive waste. This term also includes hazardous vapors (for example, glutaraldehyde, ethylene oxide, nitrous oxide) and hazardous energy sources (for example, ionizing or non-ionizing radiation, lasers, microwave, ultrasound). Although The Joint Commission considers infectious waste as falling into this category of materials, federal regulations do not define infectious or medical waste as hazardous waste.

Health care–associated infection (HAI): An infection acquired concomitantly by an individual who is receiving or who has received care, treatment, or services from a health care organization. The infection may or may not have resulted from the care, treatment, or services.

HEPA (High-Efficiency Particulate Air) filter: A disposable, extended medium, dry type filter with a particle removal efficiency of no less than 99.97 percent for 0.3μm particles.¹

High reliability organization (HRO): Systems operating in hazardous conditions that have fewer than their fair share of adverse events.⁷

High risk procedures or processes: A procedure or process that, if not planned and/or implemented correctly, has a significant potential for affecting the safety of a patient or an individual served.

Horizontal violence (horizontal hostility): Physical, verbal, or emotional abuse of an employee. Within nursing, lateral violence has been defined as nurse-to-nurse aggression. This violence can be manifested in verbal or nonverbal behaviors.⁵

Infection: The transmission of a pathogenic microorganism to a host, with subsequent invasion and multiplication, with or without resulting symptoms of disease.

Invasive procedure: The puncture or incision of the skin, insertion of an instrument, or insertion of foreign material into the body for diagnostic or treatment-related purposes. Examples of invasive procedures include central line and chest tube insertions and cardiac catheterization. Venipuncture is not categorized as an invasive procedure.

Lateral violence: See *Horizontal violence*.

Life Safety Code®: A set of standards for the construction and operation of buildings intended to provide a reasonable degree of safety during fires. These standards are prepared, published, and periodically revised by the National Fire Protection Association and adopted by The Joint Commission to evaluate health care organizations under its life safety management program.

Maintenance: There are five types of maintenance—predictive, metered, corrective, interval based, and reliability centered: (1) Predictive maintenance is a type of maintenance strategy that provides the means to achieve reliability levels that exceed the performance of a piece of equipment or system. This strategy is designed to measure and track data significant to the piece of equipment or system. It confirms possible faults with the equipment, and specific repairs are completed before the equipment fails. Predictive analysis can be performed using advanced monitoring instruments and predictive software that collects data and performs an analysis. The data collected are analyzed, and corrective maintenance is performed when the equipment is performing outside the desired operating parameters. (2) Metered maintenance strategy is based on the hours of run time or the number of times the equipment is used (for example, number of images processed). (3) Corrective maintenance strategy restores a piece of equipment to operational status after equipment failure. (4) Interval-based maintenance is done according to specific intervals (for example, calendar time, running hours). A number of periodic inspections or restoration tasks are completed based on information/data

obtained from the last equipment check. (5) Reliability-centered maintenance is a type of maintenance that begins with a failure mode and effects analysis to identify the critical equipment failure modes in a systematic and structured manner. The process then requires the examination of each critical failure mode to determine the optimum maintenance policy to reduce the severity of each failure. The chosen type of maintenance strategy must take into account cost, safety, and environmental and operational consequences. Some functions are not critical and may be allowed to “run to failure,” while other functions must be preserved at all cost. Reliability-centered maintenance emphasizes the use of predictive maintenance techniques in addition to traditional preventive measures (metered, corrective, and interval based).

Management system: Major elements of an effective occupational safety and health management system include the following four aspects: management commitment and employee involvement; worksite analysis; hazard prevention and control; and safety and health training.⁸

Measure of Success (MOS): A numeric or otherwise quantifiable measure usually related to an audit that determines whether an action was effective and sustained.

Medical device: An instrument, apparatus, implement, machine, contrivance, implant, in vitro reagent, or another similar or related article, including a component part or accessory that is (1) recognized in the official National Formulary or the US Pharmacopeia or any supplement to them; (2) intended for use in the diagnosis of disease or other conditions or in the cure, mitigation, treatment, or prevention of disease in humans or other animals; or (3) intended to affect the structure or any function of the body of humans or other animals and that does not achieve any of its primary intended purposes through chemical action within or on the body of humans or other animals and that is not dependent on being metabolized for the achievement of any of its primary intended purposes.

Medical equipment: Fixed and portable equipment used for the diagnosis, treatment, monitoring, and direct care of individuals.

Medical staff: The group of all licensed independent practitioners and other practitioners privileged through the organized medical staff process that is subject to the medical staff bylaws. This group may include others such as retired

practitioners who no longer practice in the organization but who wish to continue their membership in the group, courtesy staff, scientific staff, and so forth.

Medication error: A preventable event that may cause or lead to inappropriate medication use or patient harm while the medication is in the control of the health care professional, patient, or consumer. Such events may be related to professional practice, health care products, procedures, and systems, including prescribing; order communication; product labeling, packaging, and nomenclature; compounding; dispensing; distribution; administration; education; monitoring; and use.

Mental abuse: Intentional mistreatment of an individual that may cause psychological injury. Examples include humiliation, harassment, exploitation, and threats of punishment or deprivation.

National Center for Health Statistics (NCHS): A center within the CDC that is responsible for the collection, analysis, and dissemination of health statistics. NCHS has two major types of data systems: those based on population data collected through personal interviews or examinations and systems based on individual records, with data collected from state and local vital and medical records.⁶

National Center for Infectious Disease (NCID): A center in the CDC whose mission is to prevent illness, disability, and death caused by infectious diseases in the United States and around the world. NCID accomplishes its mission by conducting surveillance, epidemic investigations, epidemiologic and laboratory research, training, and public education programs to develop, evaluate, and promote prevention and control strategies for infectious diseases.⁶

National Center for Injury Prevention and Control (NCIPC): A center in the CDC whose mission is to reduce morbidity, disability, mortality, and costs associated with non-occupational injuries.⁶

National Electronic Injury Surveillance System (NEISS): A data system maintained by the Consumer Product Safety Commission (CPSC) to monitor consumer product-related injuries, representing a national sample of US Emergency departments. In an interagency agreement with NIOSH, NEISS also collects and codes data on all work-related injuries from emergency departments regardless of consumer product involvement.⁶

National Health Interview Survey (NHIS): A cross-sectional household interview survey by the National Center for Health Statistics (NCHS), which is a principal source of information on the health of the US civilian population. NHIS data are used to monitor trends in illness, injury, and disability and to track progress toward achieving national health objectives.⁶

National Occupational Research Agenda (NORA): A NIOSH-sponsored partnership program to stimulate innovative research and improved workplace practices. Unveiled in 1996, NORA has become a research framework for NIOSH and the nation. The program entered its second decade in 2006 with a new industry sector-based structure to better move research to practice within workplaces. Health care and social assistance is one of the 10 industry sectors.⁹

National Institute for Occupational Safety and Health (NIOSH): A federal agency responsible for conducting research and making recommendations for the prevention of work-related injury and illness. NIOSH is part of the Centers for Disease Control and Prevention in the Department of Health and Human Services.¹

Nursing staff: Personnel within an organization who are accountable for providing and assisting in the provision of nursing care. Such personnel must include registered nurses (RNs), and may include others such as advanced practice registered nurses (APRNs), licensed practical or licensed vocational nurses (LPNs/LVNs), and nursing assistants or other designated unlicensed assistive personnel.

Orientation: A process used to provide initial training and information while assessing the competence of clinical staff relative to job responsibilities and the organization's mission and goals.

OSHA: The Occupational Safety and Health Administration is a federal agency in the Department of Labor responsible for developing and enforcing safety and health regulations and providing training, outreach, education, and assistance.⁶

Outbreak: The occurrence of more than the expected number of cases of disease, injury, or other health conditions among a specific group during a specified time frame.

Outcome measure: A tool used to assess data that indicates the results of performance or nonperformance of a function or procedure.

Patient: An individual who receives care, treatment, or services. Synonyms used by various health care fields include *resident, patient and family unit, individual served, consumer, health care consumer, customer, and beneficiary*.

Performance improvement: The systematic process of detecting and analyzing performance problems, designing and developing interventions to address the problems, implementing the interventions, evaluating the results, and sustaining improvement.

Performance measurement system: A method of gauging organization performance that facilitates improvement through the collection of data and information and the dissemination of process and/or outcome measures over time.

Personal protective equipment (PPE): Devices worn by a health care worker to protect against hazards in the environment. Examples include respirators, gloves, and hearing protectors.¹

Physical abuse: Intentional mistreatment of an individual that may cause physical injury. Examples include hitting, slapping, pinching, or kicking, and may also include attempts to control behavior through corporal punishment.

Prevention effectiveness: A process to evaluate the effectiveness of prevention activities. These assessments use decision analysis, meta-analysis, economic analysis, and other methods to determine the effect of prevention programs on public health.⁶

Quality of care, treatment, and services: The degree to which care, treatment, or services for individuals and populations increases the likelihood of desired health or behavioral health outcomes. Considerations include the appropriateness, efficacy, efficiency, timeliness, accessibility, and continuity of care; the safety of the care environment; and the individual's personal values, practices, and beliefs.

Quantitative result: A test result that is measured as a discrete number.

Teach-back (read-back): A method used to ensure understanding of information that is communicated, often between members of a caregiving team. The process involves an individual receiving verbal information (such as an order or a test result), recording the complete information, and then reading back and confirming the information to the individual who provided the information.

Reassessment: Ongoing data collection, which begins on initial assessment, comparing the most recent data with the data collected at earlier assessments.

Respirator: A device worn over an individual's face that is designed to reduce the wearer's exposure to airborne contaminants. Respirators come in various sizes and must be individually selected to provide a tight seal over the face. A proper seal between the user's face and the respirator forces inhaled air to be pulled through the respirator's filter material and not through gaps between the face and respirator. Where workers are required by employers to wear respirators, they must be NIOSH-certified, selected, and used in the context of a comprehensive respiratory protection program, (see OSHA standard 29 CFR 1910.134, or <http://www.osha.gov/SLTC/respiratoryprotection/index.html>).¹⁰

Risk: The probability that a disease, injury, condition, death, or related occurrence may occur for a person or population.⁶

Risk assessment, proactive: An assessment that examines a process in detail including sequencing of events, actual and potential risks, and failure or points of vulnerability and that prioritizes, through a logical process, areas for improvement based on the actual or potential impact (that is, criticality) of care, treatment, or services provided.

Root cause analysis (RCA): A process for identifying a basic or causal factor(s) underlying variation in performance, including the occurrence or possible occurrence of a sentinel event.

Safety: The degree to which the risk of an intervention (for example, use of a drug, or a procedure) and risk in the care environment are reduced for a patient and other persons, including health care practitioners. Safety risks may arise from the performance of tasks relating to the structure of the physical environment or from situations beyond the organization's control (such as weather).

Safety management: Activities selected and implemented by the organization to assess and control the impact of environmental risk and improve general environmental safety.

Secure: Safety within a locked container, in a locked room, or under constant surveillance.

Security: Protection of people and property against harm or loss (for example, workplace violence, theft, access to medications). Security incidents may be caused by persons from outside or inside the organization.

Sentinel event: An unexpected occurrence involving death or serious physical or psychological injury or the risk thereof. The phrase “or the risk thereof” includes any process variation for which a recurrence would carry a significant chance of a serious adverse outcome.

Sentinel Event Notification Systems for Occupational Risks (SENSOR): A NIOSH cooperative agreement program with state health departments, or other state agencies in collaboration with state health departments, which develops generalizable condition-specific strategies for state-based surveillance of occupational diseases and injuries. Efforts have focused upon standardization of variables collected by the state programs, creation of software to facilitate adoption of the surveillance systems by additional states, comparison of SENSOR findings to other surveillance data sources, collaboration with The Council of State and Territorial Epidemiologists (CSTE) on building infrastructure for state-based surveillance, further development of state-based hazard surveillance, and publication and dissemination of SENSOR reports. A key focus of the SENSOR program is to enhance the linkage between surveillance and intervention.⁶

Sexual abuse: Intentional mistreatment of a sexual nature of an individual that may cause physical and/or psychological injury. Synonyms include *sexual harassment*, *sexual coercion*, and *sexual assault*.

Staff: As appropriate to their roles and responsibilities, all people who provide care, treatment, or services in the organization, including those receiving pay (for example, permanent, temporary, and part-time personnel, as well as contract employees), volunteers, and health profession students. The definition of staff does not include licensed independent practitioners who are not paid staff or who are not contract employees.

Standard: A principle of patient safety and quality of care that a well-run organization meets. A standard defines the performance expectations, structures, or processes that must be substantially in place in an organization to enhance the quality of care, treatment, or services.

Surgical mask: Surgical masks are used as a physical barrier to protect the user from hazards, such as contact with large droplets of blood or body fluids. Surgical masks also protect other people against infection from the person wearing the surgical mask. Such masks trap large particles of body fluids that may contain bacteria or viruses expelled by the wearer. Surgical masks are used for several different purposes, including the following:

- Placed on sick people to limit the spread of infectious respiratory secretions to others.
- Worn by health care providers to prevent accidental contamination of patients’ wounds by the organisms normally present in mucus and saliva.
- Worn by workers to protect themselves from splashes or sprays of blood or bodily fluids; they may also keep contaminated fingers/hands away from the mouth and nose.¹⁰

Surveillance: The ongoing systematic collection, analysis, and interpretation of data concerning the frequency or pattern of, and causes or factors associated with, a given disease, injury, or other health condition. Data analysis is followed by the dissemination of that information to those who can improve outcomes. Examples of surveillance data can include ventilator-associated pneumonia, antibiotic prophylaxis, hemodialysis catheter infections, implant infections, surgical-site infections, hand hygiene, drug-resistant organisms (MRSA, VRE), equipment sterile processing, vaccinations, urinary tract infections, and health care worker immunization.

Synergy: A mutually advantageous conjunction or compatibility of distinct business participants or elements.¹¹

The Joint Commission: An independent, not-for-profit organization dedicated to improving the safety and quality of health care through standards development, public policy initiatives, accreditation, and certification. The Joint Commission accredits and certifies more than 19,000 health care organizations and programs in the United States.

Time-out, invasive procedure: An immediate pause by the entire surgical team to confirm the correct patient, procedure, and surgical site.

Tracer methodology: A process surveyors (The Joint Commission) use during the on-site survey to analyze an organization's systems, with particular attention to identified priority focus areas, by following an individual patient, resident, or individual served through the organization's care process in the sequence experienced by each individual. Depending on the setting, this process may require surveyors to visit multiple care programs and services within an organization or within a single program or service to "trace" the care rendered.

Transmission-based precautions: Infection prevention and control measures to protect against exposure to a suspected or identified pathogen. These precautions are specific and based on the way the pathogen is transmitted. Categories include contact, droplet, airborne, and a combination of these.

Voluntary Protection Program (VPP): A program offered by OSHA that recognizes employers and workers in private industry and federal agencies who have implemented effective safety and health management systems and maintain injury and illness rates below national averages for their respective industries. In VPP, management, labor, and OSHA work cooperatively and proactively to prevent fatalities, injuries, and illnesses through a system focused on hazard prevention and control; worksite analysis; training; and management commitment and worker involvement. To participate, employers must submit an application to OSHA and undergo a rigorous on-site evaluation by a team of safety and health professionals. Union support is required for applicants represented by a bargaining unit. VPP participants are reevaluated every three to five years to remain in the programs. VPP participants are exempt from OSHA-programmed inspections while they maintain their VPP status.¹²

Workarounds: As described by Halbesleben et al., 2008, workarounds are alternative, informally designed, and inconsistently applied work processes that expedite work flow but sometimes subvert specific safeguards to prevent efforts that can impact patients and/or workers.¹³

Workplace bullying: Repeated inappropriate behavior, direct or indirect, whether verbal, physical or otherwise, conducted by one or more persons against another or others, at the place of work and/or in the course of employment, which could reasonably be regarded as undermining the individual's right to dignity at work.¹⁴

Workplace violence: Violent acts (including physical assaults and threats of assaults) directed toward persons at work or on duty. Workplace violence, ranging from offensive or threatening language to homicide, can be divided into four categories, including violence by strangers, clients (patients), coworkers, and personal relations.¹⁵

—All definitions not otherwise indicated are based on *The Joint Commission's Comprehensive Accreditation Manual for Hospitals Glossary, 2012*.

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– Appendix C –

Description of Selected OSHA Standards Relevant to Health Care

Source: Pandemic Influenza Preparedness and Response Guidance for Healthcare Workers and Healthcare Employers. Occupational Safety and Health Administration, US Department of Labor. OSHA 3328-05R. 2009.

Description of Selected OSHA Standards Relevant to Health Care

OSHA Standards of Special Importance

The role of OSHA is “to assure safe and healthful working conditions for working men and women.” Employers have a responsibility to furnish employees “a place of employment which is free from recognized hazards that are causing or are likely to cause death or serious physical harm.” In addition, employers must comply with occupational safety and health standards promulgated by OSHA or by a state with an OSHA-approved state plan. (More information about state occupational safety and health programs can be found at <http://www.osha.gov/fso/osp/index.html>.) OSHA standards applicable to health care facilities are addressed in the standards for General Industry. In addition, the Respiratory Protection standard, the Personal Protective Equipment standard, and the Bloodborne Pathogens standard have special importance to pandemic preparedness and response.

Personal Protective Equipment Standard-29 CFR 1910.132

When engineering controls, work practices, and administrative controls are infeasible or do not provide sufficient protection, employers must provide appropriate personal protective equipment (PPE) and ensure its proper use. PPE is worn to minimize exposure to a variety of workplace hazards. PPE can include protection for eyes, face, head, and extremities. Gowns, face shields, gloves, and respirators are examples of commonly used PPE within healthcare facilities.

Employers must conduct a workplace hazard assessment to determine if hazards are present that necessitate the use of PPE. The employer must verify that the required workplace hazard assessment has been performed through a written certification that identifies the workplace evaluated; the person certifying that the evaluation has been performed; the date(s) of the hazard assessment; and, which identifies the document as a certification of hazard assessment. Based on the hazard assessment, employers are to select PPE that will protect employees from the identified hazards. Employees are to receive training to ensure that they understand the hazards present, the necessity of the PPE, and its limitations. In addition, they must learn how to properly put on, take off, adjust, and wear PPE. Finally, employees must understand the proper care, maintenance, and disposal of PPE.

Healthcare employers can receive more information about the Personal Protective Equipment standard at <http://www.osha.gov/SLTC/personalprotectiveequipment/index.html>.

Description of Selected OSHA Standards Relevant to Health Care

Respiratory Protection Standard-29 CFR 1910.134

The primary objective of OSHA's Respiratory Protection standard is to protect employees against inhalation of harmful airborne substances or oxygen-deficient air. This standard applies to all occupational airborne exposures where employees are exposed to a hazardous level of an airborne contaminant. The inhalation of pathogenic organisms known to cause human disease is covered by this standard.

Employers are required to use feasible engineering controls as the primary means of controlling air contaminants. Respirators should be used for protection only when engineering controls have been shown to be technologically or economically infeasible or while they are being instituted for the control of the hazard.

Healthcare facilities requiring the use of respirators must implement a comprehensive respiratory protection program. These programs are to be overseen by a qualified program administrator and have key elements that include respirator selection, training, medical certification, fit testing, maintenance and cleaning, and program review.

Information describing all of the elements of a comprehensive respiratory protection program and the use of respirators can be found at <http://www.osha.gov/SLTC/respiratoryprotection/index.html>.

Bloodborne Pathogens Standard-29 CFR 1910.1030

OSHA's Bloodborne Pathogens standard is a regulation that protects employees against health hazards related to the occupational exposure to bloodborne pathogens. The standard applies to any employee who is occupationally exposed to human blood or certain other potentially infectious materials (e.g., pleural fluid, any body fluids visibly contaminated with blood, any unfixed human tissue or organ). The Bloodborne Pathogens standard has provisions requiring exposure control plans, engineering and work practice controls, PPE, hepatitis B vaccination, hazard communication, training, and recordkeeping.

Additional information on the Bloodborne Pathogens standard is available at <http://www.osha.gov/SLTC/bloodborne pathogens/index.html>.

General Duty Clause

In addition to compliance with the hazard-specific safety and health standards, employers must provide their employees with a workplace free from recognized hazards likely to cause death or serious physical harm. Employers can be cited for violating the General Duty Clause of the OSH Act if they do not take reasonable steps to abate or address such recognized hazards.

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