



NORA

NATIONAL OCCUPATIONAL RESEARCH AGENDA (NORA)

NATIONAL HEALTHCARE AND SOCIAL ASSISTANCE AGENDA

FOR OCCUPATIONAL SAFETY AND HEALTH RESEARCH
AND PRACTICE IN THE U.S. HEALTHCARE AND SOCIAL
ASSISTANCE (HCSA) SECTOR

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Introduction

The National Occupational Research Agenda

The National Occupational Research Agenda (NORA) is a partnership effort of stakeholders engaged in identifying critical knowledge gaps and stimulating innovative research to improve workplace health and safety practices. Unveiled in 1996, NORA has become a research framework for NIOSH and the nation. Diverse parties collaborate to identify the most critical needs in workplace safety and health. Partners then work together toward solutions to address these needs.

The NORA Healthcare and Social Assistance (HCSA) Agenda is one element of the larger NORA endeavor. This sector agenda primarily focuses on the question: “What information is needed to reliably protect service providers’ health and safety and, at the same time, ensure patient and client safety, given the high hazard nature and risk of injury in this critical work sector?” The Agenda, drafted by stakeholders, consists of strategic goals designed to address top safety and health concerns and to promote the greatest opportunities to advance protections within workplaces covered by the HCSA Sector.

The Agenda addresses a wide range of research in disciplines as diverse as laboratory bench research and the social science and human behavior arenas. Issues in the social and behavioral sciences inform public health practice methods that may, for example, increase the likelihood that new, safer work practices, when identified, will be adopted in the workplace. These sciences may also suggest efficiencies in applying new knowledge and translating research findings into usable tools and information that can be used by HCSA stakeholders to bring about safer industry practices.

Informed by an expanded definition of research that values the importance of ‘real world’ effectiveness of research results and dissemination of findings to those who can benefit from them, the NORA process seeks to facilitate rapid translation and application of research findings. Such “research to practice” (R2P) endeavors have long been a NIOSH priority and are reflected in the goals of this sector agenda, actively linking research and workplace impact. While not every stakeholder group is conducting research, almost every HCSA stakeholder group is involved with converting knowledge into practice for use by employers, owners and practitioners. Developing this NORA HCSA Agenda provides a vehicle for stakeholders to describe what they believe are the most relevant issues, gaps and safety and health needs in the industry.

The NORA HCSA Agenda will provide guidance for industry stakeholders (e.g., industry, labor, professionals and academics) to prioritize the many safety and health issues of interest. It is intended to inspire decision makers to address these topics as top priorities; to steer researchers to cohesive topic areas for research proposals; and to encourage dialogue and partnering among stakeholders on a subset of key issues – thus increasing our collective ability to make an impact in reducing injuries and illnesses among workers in industries covered by the HCSA Sector.

Healthcare and Social Assistance Sector Council

In response to its charge to develop and maintain a HCSA sector specific research agenda, the HCSA Sector Council developed a document, “State of the Sector—Healthcare and Social Assistance: Identification of Research Opportunities for the Next Decade of NORA” (NORA HCSA Council, [NIOSH], 2009). The document provides information on 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. The HCSA Research Agenda is broad and reflects the diversity of the four subsectors that comprise the North American Industry Classification System (NAICS, 2012) Sectors 62 and several newly-added subsectors related to veterinary medicine and animal care (described below). It has been developed based on evidence provided in the referenced document and on interactions with, and input from, experts and stakeholders engaged in veterinary medicine and animal care. However, it is not intended to be an inventory of every possible issue of interest. Nor should the Agenda be viewed as suggesting that other topics are unimportant. In an attempt to focus the Agenda, the HCSA Sector Council purposely restricted the number of critical topics or primary problem areas to a relatively small, manageable set of goals. The Council anticipated a process in which these goals were to be revised and reprioritized every few years as conditions change. The Council began with a focus on the healthcare subsectors. The unique issues of the social assistance subsector, in particular child daycare services, are being addressed by the Sector Council. Additionally, a work group of the Sector Council is addressing occupational safety and health issues in veterinary and animal care services – a decision made because of the many parallels of human and animal healthcare and the fact that veterinary and animal care services are not specifically addressed by other NORA industry sector agendas.

Basis for the Healthcare and Social Assistance Sector Research Agenda

Background: Public awareness of the potential for healthcare to be a source of harm to patients, through exposure to infectious agents and unintended error or known side effects of hazardous treatments, has spawned a highly visible “patient safety” movement. Less visible, however, is the risk this same environment and these same hazards impose on the health of the men and women who work there. Although often thought of as clean and safe, workplaces in the HCSA Sector are associated with many of the same types of exposures to chemicals and hazards found in “blue collar” industrial settings. The HCSA Sector is burdened by the historical and entrenched belief that patient care issues supersede the personal safety and health of workers, and that it is acceptable for HCSA workers to have less than optimal protections against the risks of hazardous exposures or injuries. Because patients and providers share the healthcare environment, efforts to protect patients and providers can be complementary, even synergistic, when pursued through a comprehensive, integrated approach.

HCSA Sector Industries: The industries covered by the NORA HCSA Sector engaged in caring for people are defined by the NAICS 62 and include establishments which provide healthcare and social assistance to individuals. These industries are on a continuum, starting with those establishments providing medical care exclusively, continuing with those providing both healthcare and social assistance and, finally, those providing only social assistance. These four NAICS subsectors include – Ambulatory Healthcare Services (621, except 62191- ambulance services which are covered by the NORA Public Safety industry sector); Hospitals (622);

Nursing and Residential Care Facilities (623); and Social Assistance (624). Social assistance includes establishments that provide nonresidential individual and family services for youth, elderly and persons with disabilities; community food, housing and emergency relief services; vocational rehabilitation services; and child day-care services.

As noted above, the HCSA sector agenda now also includes two industries engaged in veterinary medicine and animal care (VM/AC). Veterinary services (NAICS 541940) comprises establishments of licensed veterinary practitioners primarily engaged in the practice of veterinary medicine, dentistry, or surgery for animals; and establishments primarily engaged in providing testing services for licensed veterinary practitioners. Pet care except veterinary services (NAICS 812910) provides services such as boarding, grooming, sitting, and training pets. The issues and priorities described in the NORA HCSA Agenda also apply to VM/AC workers in other industries. Examples of these industries include zoos and botanical gardens (NAICS 712130), which employs zoo workers, and a range of industries that employ laboratory animal care workers to enable life sciences research, such as academic institutions, pharmaceutical or biotechnology companies, etc. Services provided by farmers, ranchers and other workers in industries that are included in the NORA Agriculture, Forestry and Fishing Sector, which has developed goals to address their needs, are not included in the NORA HCSA Agenda.

HCSA Sector Demographics: Over 19 million people, nearly 14% of the U.S. workforce, are employed within industries covered by the HCSA Sector (BLS, 2011a). Over 80% of the workers are in healthcare industries, 18% in social assistance industries, and less than 2% in veterinary and animal care services. Growth of the HCSA Sector through 2018 is projected to be more than any other industrial sector (Summers & Franklin, 2012). About 80% of HCSA workers are women, a greater percentage than in any other industrial sector and nearly double that for all industrial sectors combined. Social assistance employs a greater percentage of women than healthcare, with child day-care services having the greatest percentage (95%). Over 78% of workers employed in veterinary services are female; this information is unavailable for pet care services.

HCSA Sector Occupations: Workers in the HCSA Sector provide services to the sick and those in need of assistance and now includes animals. A partial list of these occupations includes physicians, dentists, veterinarians, dental hygienists and assistants, pharmacists, nurses, nursing aides, technologists and technicians, home health aides, respiratory therapists, occupational and speech therapists, social workers, animal care workers, child care workers, and personal and home care aides. Registered nurses constitute the largest occupation within the sector and number over two million, of which 70% are employed in hospitals (BLS, 2011a). Nurses are perhaps the best studied group within the HCSA Sector and issues with nursing recruitment, retention and burnout exemplify the occupational safety and health issues faced by the entire sector. The industry also employs many occupations found in other industries, such as food preparers and servers; housekeeping cleaners; ambulance, truck, and bus drivers; pilots; receptionists; billing and posting clerks; material moving workers; secretaries; and file clerks.

Connection Between Patient and Worker Safety: Promoting a culture of safety in the healthcare workplace benefits workers, patients, family members and all who enter these facilities. The potential hazards which exist in healthcare settings – such as exposures to airborne infectious agents; unassisted lifting and transfer of patients; contaminated equipment and surfaces; slippery floors; or encounters with distraught, potentially violent emergency room visitors – affect both patients and workers. Similarly, safe patient lift assist equipment protects the healthcare worker's

back and also prevents patient injury from skin tears or unanticipated falls during lifting. Thus, safety programs should not discriminate between patients and workers. Rather, they should promote comprehensive “systems of safety” and “cultures of safety” in these facilities.

Health and Safety Issues: Although there are many commonalities between the occupational safety and health problems faced by HCSA workers and workers in other industrial sectors (e.g., exposure to hazardous chemicals), there are also a number of issues that are unique to the sector. Because eight in 10 HCSA workers are women, adverse reproductive outcomes and obligations outside of the workplace are especially prominent issues. Also unique to the HCSA Sector is the stress of dealing with the highly charged HCSA environment, exacerbated by suboptimal patterns of work organization, including long or unpredictable work hours, rotating shifts and under-staffing. Other unique hazards include risks associated with patient lifting and handling, exposures to hazardous drugs administered to patients and sharps injuries with their associated risk of transmitting hepatitis virus or other bloodborne pathogens. HCSA workers must also face *unknown* exposures and risks as they are routinely on the front line in caring for those with emerging infectious diseases, such as severe acute respiratory syndrome (SARS), emerging strains of influenza (e.g., avian, novel H1N1, emerging pandemic strains) and, potentially, victims of bioterrorism attacks using agents such as anthrax and smallpox.

Veterinary medicine and animal care personnel share many of the same hazards found in human healthcare. In addition, these workers face hazards which are different than those found in human healthcare including zoonotic diseases (rabies, brucellosis), specific physical assaults (bites, kicks), respiratory problems (animal allergens), specific reproductive hazards (veterinary hormones), and specific physical hazards in certain environments (noise, heat/cold).

Conclusion: The HCSA Sector represents a large, growing and critically important set of employers and care providers and a dynamic segment of the U.S. economy. The industries covered by this NORA Sector Council face a range of occupational safety and health issues, many of them uniquely important to the Sector, that threaten the safety of workers and patients and significantly impair the ability of the Sector to retain its workforce. Dealing with this range of issues requires commitment to safety by all involved and a comprehensive approach to safety and health. Although many examples exist of institutions that have successfully adopted comprehensive approaches to safety and health, it is our hope that implementation of this National HCSA Agenda will lead to greater awareness of issues, more widespread implementation of best practices and development of new ways to protect HCSA workers to the benefit of themselves and those they serve.

Strategic Goals 1 – 5

Safety and Health Programs

There is consensus among professional and industry groups engaged in healthcare that new management systems are essential to improve patient care and increase access to care. Promoting a culture of safety is a major goal within healthcare. Principles of management systems designed to protect and enhance the workforce are articulated in detail in documents specific to healthcare (The Joint Commission, 2005; Joint ILO/WHO, 2005) and, more generally, to worker health and safety (AIHA, 2005). The links between patient safety and worker health and productivity are

increasingly noted as efforts continue to reduce poor patient outcomes in healthcare settings (IOM 2000, 2001, 2004; The Joint Commission, 2012).

The HCSA Sector Council sets as the first strategic goal promotion of safe and healthy workplaces which optimize safety culture in healthcare organizations. This requires the promotion of injury and illness prevention programs in all healthcare settings. This goal creates a framework which supports all of the subsequent goals and which will inform future decisions regarding priorities for research and evaluation. The principles articulated here embrace those put forward in consensus documents referenced above. Some states have made worker health and safety programs mandatory and the Council assumes that, in these states, there are specific opportunities to promote and evaluate such programs. This is reflected in some intermediate Agenda goals. Goals addressing violence were added in 2012. HCSA workers are at risk for verbal, psychological and physical violence during interactions with patients, families, visitors, coworkers, and supervisors.

This Agenda presents five Strategic Goals for the four HCSA subsectors. For each Strategic Goal, information on performance measures, intermediate goals, and/or activity/output goals are provided. Strategic Goals developed by the work group for veterinary and animal care workers are presented separately later in this document (see page 27).

Strategic Goal 1: Promote safe and healthy workplaces and optimize safety culture in healthcare organizations.

Performance Measure: By 2016, effective practices for integration of patient safety and worker safety will be available.

Performance Measure: By 2014, an online violence prevention course developed by NIOSH and partners will be available for nurses.

Performance Measure: By 2014, an online training program to minimize the hazards of shift work and long work hours will be developed by NIOSH and partners and will be available for nurses.

The following intermediate goals emphasize four broad areas where effective actions are needed: structure work organization to optimize safe and healthy workplaces for workers, patients, clients and consumers; promote a culture of safety; establish effective injury and illness prevention programs; and increase adoption of proven interventions.

Recommended elements of prevention programs include:

- Management commitment and worker involvement
- Data systems that track, trend and communicate hazards, illness and injuries
- Workplace assessment of risks to worker and patient safety
- Root cause and systematic analysis of work-related incidents and injuries
- Hazard elimination
- Open communications and positive orientation toward continuous learning and improvement related to worker safety and health
- Workforce and management training

- Worker leadership training to promote full participation in injury and illness prevention programs

Safety needs are a core organizational value and need to be incorporated into all organizational activities.

Intermediate Goal 1.1: Structure work organization to optimize safe and healthy workplaces for workers, patients, clients and consumers: Healthcare and social services organizations will develop and implement organizational and management structures and strategies that best support the minimization of work overload.

Activity/Output Goal 1.1.1: NIOSH and key stakeholders will determine appropriate management competencies with respect to workplace safety and health for hospital and non-hospital based managers.

Activity/Output Goal 1.1.2: Identify most appropriate job competencies and selection criteria for healthcare managers.

Activity/Output Goal 1.1.3: Develop, implement and evaluate management training programs specific to this sub goal.

Intermediate Goal 1.2: Structure work organization to optimize safe and healthy workplaces for workers, patients, clients and consumers: Hospitals and other healthcare and social service settings will adopt best practices of scheduling and staffing that will minimize excessive workload and other factors associated with fatigue in the HCSA Sector.

Activity/Output Goal 1.2.1: Identify best practice guidelines for scheduling, staffing and worker/patient/client ratios.

Activity/Output Goal 1.2.2: Assess the impact of excessive workloads and demanding work schedules on recruitment of new staff, retention and job exit.

Activity/Output Goal 1.2.3: Evaluate the impact of excessive workload and demanding work schedules on organizational outcomes (e.g., productivity, costs associated with patient safety, recruitment and hiring, the training of new workers, etc.).

Activity/Output Goal 1.2.4: Determine the impact of workload and demanding work schedules on worker outcomes, such as quality of work, quality of “work life,” injuries, near misses and psychosocial work-stress.

Activity/Output Goal 1.2.5: Assess the impact of workload and work schedules on patient/client outcomes (e.g., medical errors, quality of care, patient safety and satisfaction).

Activity/Output Goal 1.2.6: Identify factors that lead to premature retirement and find ways to encourage older workers to safely continue employment.

Intermediate Goal 1.3: Structure work organization to optimize safe and healthy workplaces for workers, patients, clients and consumers: Foster dissemination and implementation of effective teaching tools and strategies concerning risks of excessive

workload and demanding work schedules to workers and managers in the health care sector.

Activity/Output Goal 1.3.1: Develop teaching tools and strategies.

Activity/Output Goal 1.3.2: Identify methods to disseminate the teaching tools and strategies.

Activity/Output Goal 1.3.3: Develop implementation strategies for the teaching tools and strategies.

Activity/Output Goal 1.3.4: Evaluate the effectiveness of implemented teaching tools and strategies.

Intermediate Goal 1.4: Promote a culture of safety: Enhance knowledge and skills needed to operationalize a culture of safety.

Activity/Output Goal 1.4.1: Identify key safety culture elements.

Activity/Output Goal 1.4.2: Develop a safety culture toolkit for hospital settings, including a safety climate survey.

Activity/Output Goal 1.4.3: Create a modified safety culture toolkit for non-hospital settings.

Activity/Output Goal 1.4.4: Develop “return on investment” metrics associated with safety culture initiatives.

Activity/Output Goal 1.4.5: Design a participatory action framework for safety climate for employees and representatives (i.e., unions).

Activity/Output Goal 1.4.6: Develop and test effective teaching tools and strategies to promote a safety culture.

Activity/Output Goal 1.4.7: Disseminate educational materials to healthcare organizations, workers and managers.

Intermediate Goal 1.5: Promote a culture of safety: Healthcare organizations will institute best-practices management structures in the healthcare sector that best support a strong safety culture.

Activity/Output Goal 1.5.1: Identify existing best practices and management structures that best support a safety culture.

Activity/Output Goal 1.5.2: Conduct a systematic review of management practices and safety culture.

Activity/Output Goal 1.5.3: Prepare and disseminate best practices management tool kits.

Activity/Output Goal 1.5.4: Develop and test effective teaching tools and strategies to disseminate best management practices and safety culture to HCSA organizations and managers.

Intermediate Goal 1.6: Establish effective injury and illness prevention programs: Analyze existing injury and illness prevention programs and assess reasons for success and failure.

Activity/Output Goal 1.6.1: Identify best practices in establishing and nurturing programs.

Activity/Output Goal 1.6.2: Identify factors and strategies that motivate adoption and maintenance of effective programs.

Activity/Output Goal 1.6.3: Develop policy to promote adoption of effective programs.

Intermediate Goal 1.7: Establish effective injury and illness prevention programs: Healthcare organizations, in states with mandated health and safety programs, will partner with worker representative organizations to implement effective programs.

Activity/Output Goal 1.7.1: Identify states with mandated programs.

Activity/Output Goal 1.7.2: Partner with states, healthcare institutions and worker representative organizations to implement effective programs in hospitals, ambulatory care settings, nursing homes and home care settings.

Intermediate Goal 1.8: Establish effective injury and illness prevention programs: Healthcare organizations with established programs will undertake systematic review of each program element, identify obstacles and develop solutions.

Activity/Output Goal 1.8.1: Document barriers to implementation of effective programs.

Activity/Output Goal 1.8.2: Describe solutions to promote effective programs.

Activity/Output Goal 1.8.3: Document case studies of successful programs.

Intermediate goal 1.9: Increase adoption of proven interventions: Promote and increase adoption of comprehensive, coordinated and effective workplace health protection/health promotion programs, policies and practices for improving worker health and safety.

Activity/Output Goal 1.9.1: NIOSH, along with partners, will develop best-practice guidelines for effective workplace health protection/health promotion programs in healthcare settings.

Activity/Output Goal 1.9.2: Conduct a review of the worksite health protection/health promotion programs that have been successfully implemented in the healthcare and social service settings.

Activity/Output Goal 1.9.3: Develop workplace health protection/health promotion toolkits for the development and implementation of comprehensive health protection/health promotion programs in the healthcare sector.

Activity/Output Goal 1.9.4: Develop and test effective teaching tools and strategies to disseminate guidelines, toolkits and programs to HCSA organizations, workers and managers.

Intermediate Goal 1.10: Identify risk factors and effective interventions to reduce workplace violence among HCSA workers.

Activity/Output Goal 1.10.1: Conduct studies to identify risk factors for workplace violence (physical and psychological) experienced by HCSA workers.

Activity/Output Goal 1.10.2: Conduct etiologic research studies to identify the conditions that lead to physical or psychological injury/illness from workplace violence aimed at high risk HCSA workers.

Activity/Output Goal 1.10.3: Identify work organization strategies that minimize the risks of psychological trauma in the HCSA Sector due to harassment, intimidation and bullying.

Musculoskeletal Disorders (MSDs)/Slips, Trips, and Falls (STFs)

Overexertion and slip, trip, and fall (STF) incidents are two of the leading sources of worker's compensation claims and costs in healthcare settings (Collins, Bell, & Grönqvist, 2010). When examining the most disabling work-related injuries in healthcare settings, overexertion ranks first (BLS, 2012b). According to BLS data, those who work at hospitals and nursing homes, especially nursing aides, are at highest risk of sustaining a MSD or overexertion injury (particularly of the back and shoulder) and STF injuries (BLS, 2012b). Frequent lifting and repositioning of patients is the leading source of injury for healthcare workers (Guo et al., 1995). STFs are the second leading cause of lost workday injuries in all private industry as well as the HCSA Sector (BLS, 2012b). Certain subsectors within HCSA, such as nursing homes and residential care facilities, have an even greater problem with STFs. The lost workday injury rate due to falls on the same level in nursing homes and residential care facilities is 50.5 cases per 10,000 full-time workers over three times the rate for all private industry (BLS, 2012b).

In the social assistance subsector, overexertion injury and STF incidents are a problem, particularly in certain industries. Workers employed by establishments who provide services for the elderly and persons with disabilities experienced the highest lost workday injury rate for overexertion injuries in 2010 (53.9 cases per 10,000 full-time workers), over 2 times the rate for all private industry (BLS, 2012b). The lost workday injury rate due to falls on the same level was highest in vocational rehabilitation facilities (30.8 cases per 10,000 full-time workers) nearly two times the rate for all private industry (BLS, 2012b).

Strategic Goal 2: Reduce the incidence and severity of musculoskeletal disorders (MSDs) and injury events associated with slips, trips and falls among workers in the HCSA Sector.

Performance Measure: By 2016, reduce by 25% the 2005 baseline Bureau of Labor Statistics (BLS) rates of sprains and strain injuries involving days away from work in hospitals and nursing homes where healthcare patients were listed as the source of injury in the HCSA sector.

Intermediate Goal 2.1: Local, State and/or Federal governmental agencies and/or voluntary consensus standard organizations will develop national MSD standards and/or guidelines for HCSA workers.

Activity/Output Goal 2.1.1: Evaluate the effectiveness of legislative mandates for safe patient handling in hospitals, long-term care and home healthcare.

Intermediate Goal 2.2: Licensed hospitals, nursing homes and home healthcare agencies will incorporate safe patient handling and movement programs into their standards of care using national MSD standards.

Activity/Output Goal 2.2.1: Conduct research to validate the effectiveness of “best practices” safe patient handling and movement programs in hospitals, nursing homes and home healthcare settings.

Activity/Output Goal 2.2.2: Identify and evaluate alternative methods for financing large scale implementation of safe patient-handling environments in all healthcare settings.

Activity/Output Goal 2.2.3: Conduct research and identify existing resources and tools to develop business case models to demonstrate the cost-benefit and/or cost-effectiveness of safe patient handling and movement programs.

Activity/Output Goal 2.2.4: Conduct research and identify existing resources and tools to evaluate the design of healthcare facility patient rooms, patient care areas, procedural/ treatment areas, and transport areas.

Activity/Output Goal 2.2.5: Work with healthcare facility architects and architectural associations to incorporate mechanical lifting equipment, including accommodations for bariatric patients during the design of healthcare facilities.

Activity/Output Goal 2.2.6: Evaluate the relationship between staffing patterns, use of safe patient handling equipment and patient outcomes.

Activity/Output Goal 2.2.7: Evaluate different ways to successfully incorporate temporary staff into the standard of care that requires safe patient handling.

Activity/Output Goal 2.2.8: Assess different models for incorporating safe patient handling as a standard of care.

Activity/Output Goal 2.2.9: Test different models for implementing and sustaining effective safe patient handling committees and safe patient handling programs.

Activity/Output Goal 2.2.10: Conduct case studies on how to successfully reduce resistance to change in implementing safe patient handling programs.

Activity/Output Goal 2.2.11: Identify the organizational barriers to implementing safe patient handling programs and how they can be overcome.

Activity/Output Goal 2.2.12: Conduct evaluations to determine what technologies are effective in reducing biomechanical stresses associated with

pushing, pulling, carrying and minimizing awkward postures to caregivers during patient transferring tasks.

Activity/Output Goal 2.2.13: Conduct laboratory research to evaluate patient handling procedures, devices and emerging technologies for their effectiveness in safely handling bariatric patients.

Activity/Output Goal 2.2.14: Conduct research to improve sling technology.

Activity/Output Goal 2.2.15: Develop taxonomy of tasks by types of care requirements, environment and organizational capacity. Evaluate how the physical and emotional strain/anxiety for the caregiver performing patient handling tasks can be reduced.

Activity/Output Goal 2.2.16: Develop and/or identify existing algorithms that describe how patients should be lifted across all healthcare settings where patients require assistance to be moved.

Activity/Output Goal 2.2.17: Develop and test work-family balance models with respect to injury rates, retention and recruitment of nursing staff.

Activity/Output Goal 2.2.18: Assess peer cohesion models in reducing MSD injury rates and turnover.

Activity/Output Goal 2.2.19: Collaborate with The Joint Commission (TJC), the Center for Medicare and Medicaid Services (CMS), OSHA and other regulatory agencies to enforce the use of best practices based on national standards.

Intermediate Goal 2.3: Homecare and home healthcare organizations will implement safe patient handling and movement programs to prevent MSDs among homecare and home healthcare employees.

Activity/Output Goal 2.3.1: Incorporate safe patient handling into standards of home care and home healthcare.

Activity/Output Goal 2.3.2: Develop better surveillance systems for tracking injuries and illnesses experienced by home healthcare workers.

Activity/Output Goal 2.3.3: Explore how known interventions to prevent MSD injuries can be effectively used in the home healthcare setting.

Activity/Output Goal 2.3.4: Identify barriers to use of known interventions (e.g., lack of access, client resistance, lack of available help, working alone) in home healthcare and strategies for overcoming those barriers.

Activity/Output Goal 2.3.5: Explore how environmental services/housekeeping tasks contribute to rates of injuries and how risks associated with housekeeping can be addressed.

Activity/Output Goal 2.3.6: Explore how to balance the patient/consumer's right to direct their care and the rights of healthcare workers to a safe workplace.

Activity/Output Goal 2.3.7: Identify effective training programs on prevention of MSDs for homecare workers and their clients. Incorporate this training into on-going certification and continuing education programs.

Intermediate Goal 2.4: Healthcare organizations will take steps to identify and address MSDs among non-patient handling staff working in such areas such as laundry, environmental services/housekeeping and food service.

Activity/Output Goal 2.4.1: Develop better surveillance systems for tracking MSDs among non-patient care staff.

Activity/Output Goal 2.4.2: Identify effective interventions for preventing MSDs among laundry, housekeeping, and food service employees, including equipment, work organization, layout, staffing, work pace, etc.

Activity/Output Goal 2.4.3: Develop training materials addressing the prevention of MSDs in non-patient care staff.

Intermediate goal 2.5: Nursing (RN, LPN, CNA) and other allied health schools/training programs will adopt a new safe patient handling and movement curriculum to prepare new graduates for using safe patient handling and movement methods that rely on mechanical patient lifting equipment and other assistive devices to move patients as part of a comprehensive safe patient handling and movement program.

Activity/Output Goal 2.5.1: Assess the effectiveness of nursing schools in preparing new nurses for using equipment to handle patients as part of a comprehensive safe patient handling and movement program.

Activity/output goal: 2.5.2: Include safe patient handling standards in exam study materials as well as in certification and licensure exams.

Activity/output goal: 2.5.3: Develop and disseminate Schools of Public Health Continuing Education Units modules for use by nurses and others to renew license to practice.

Activity/output goal: 2.5.4: Conduct surveys of Schools of Nursing to determine if they are teaching safe patient handling and movement practices, widely disseminate existing information to Schools of Nursing and encourage Schools of Nursing to adopt new safe patient handling and movement curriculum.

Intermediate Goal 2.6: The health services industry, insurance companies, occupational safety and health professionals, trade associations, manufacturers of safety equipment and fall prevention research organizations will work together to reduce the risk of slip, trip, and fall (STF) incidents.

Activity/Output Goal 2.6.1: Conduct intervention trials in healthcare settings to evaluate the effectiveness of STF prevention measures.

Activity/Output Goal 2.6.2: Develop hazard assessment checklists for use by the healthcare industry to identify STF hazards in healthcare settings addressing the most common STF hazards.

Hazardous Drugs and Other Chemicals

Healthcare workers are potentially exposed to highly toxic hazardous drugs and other chemicals as part of their job. Healthcare workers who prepare or administer hazardous drugs (e.g., those used for cancer therapy, some antiviral drugs, hormone agents and bioengineered drugs) or who work in areas where these drugs are used may be exposed to these agents in the workplace. About 8 million U.S. healthcare workers are potentially exposed to hazardous drugs, including pharmacy and nursing personnel, physicians, environmental services workers, workers in research laboratories, veterinary care workers and shipping and receiving personnel (BLS, 2012c). Workers may be exposed to hazardous drugs when they compound or administer these drugs, during cleanup of spills or when disposing of waste (e.g., urine, feces) from patients receiving these drugs. Exposure may occur by breathing liquid aerosols or dusts or by contact with contaminated surfaces. Published studies have shown that workplace exposures to hazardous drugs can cause multiple health effects ranging from skin rashes and asthma to adverse reproductive outcomes (including infertility, spontaneous abortions and congenital malformations) and possibly leukemia and other cancers. The health risk depends on the intensity of exposure a worker has to these drugs and their toxicity. In addition to hazardous drugs, healthcare workers are also potentially exposed to other chemical agents, including cleaning and disinfecting agents, chemical sterilants, anesthetic gases, surgical smoke, natural rubber latex, mercury and tissue preservatives. Occupational exposures to these agents have been linked to adverse health effects, including allergic contact dermatitis, kidney and liver disorders, cancer, adverse reproductive outcomes and asthma. Examples of occupations with potential exposure to hazardous drugs and other chemicals include nurses, pharmacists, pharmacy technicians, operating room personnel, medical supply technicians, surgeons, anesthesiologists, dentists, diagnostic-related technologists and technicians, housekeeping and custodial personnel, and maintenance workers. In many cases, the means to eliminate or reduce exposures to all of these hazards are well recognized. Efforts need to focus on hazard recognition, promoting safe handling guidelines, identifying barriers to implementation of best practices and evaluating the effectiveness of interventions.

Strategic Goal 3: Reduce or eliminate exposures and adverse health effects caused by hazardous drugs and other chemicals.

Performance Measures: By 2016, hazardous drugs package inserts will include guidance for safe handling of the drug including safe disposal.

By 2016, identify asthma-inducing agents to be targeted for preventive interventions or substitution.

By 2016, enumerate and classify agents to which asthma in healthcare is clearly linked based on existing federal, state, employer and manufacturer-based surveillance systems.

By 2016, characterize and disseminate exposure control strategies.

Intermediate Goal 3.1: Disseminate information regarding potential hazards and best practice guidelines for preventing exposure to hazardous drugs [as defined by NIOSH and the American Society of Health-System Pharmacists (ASHP)] to healthcare workers, including those employed by small establishments (e.g., private physician offices, home healthcare, free-standing oncology centers).

Activity/Output Goal 3.1.1: Partner with professional associations and industry partners to acquire demographic information on members who compound and/or administer hazardous drugs by occupation and size and type of practice setting.

Activity/Output Goal 3.1.2: Survey members and/or convene focus groups of members working in small practice settings to identify barriers to adherence with published guidelines for safe handling of hazardous drugs.

Activity/Output Goal 3.1.3: Create and disseminate language and literacy-appropriate safe handling guidance materials for paraprofessionals (housekeepers, nurses' aides, etc.) who handle waste materials (e.g., urine, feces, soiled linens, etc.) from patients receiving chemotherapy.

Intermediate Goal 3.2: Promote safe handling of hazardous drugs across all applicable healthcare settings through collaborative efforts with Provider, Payer and Accrediting Organizations.

Activity/Output Goal 3.2.1: In collaboration with Center for Medicare and Medicaid Services (CMS), require adherence to best practice guidelines by any organization that uses CMS mechanisms for reimbursement for chemotherapy.

Activity/Output Goal 3.2.2: Conduct a focused educational campaign on safe handling of hazardous drugs for all healthcare organizations through collaborations with accrediting bodies for hospitals, home care, ambulatory care, pharmacies, etc.

Intermediate Goal 3.3: Eliminate (through substitution) or reduce exposures and adverse health effects caused by chemical agents (other than hazardous drugs) that are used or generated in healthcare establishments.

Activity/Output Goal 3.3.1: Recognize and identify chemicals that may be associated with adverse health effects among healthcare workers by occupational group and job task. Health effects of particular concern include skin disorders (e.g., dermatitis), respiratory disease (e.g., asthma), adverse reproductive outcomes and malignant diseases.

Activity/Output Goal 3.3.2: Develop a mechanism for pre-evaluation of health and environmental impact of new chemical-containing products and equipment through collaborative efforts of management (executive leadership, purchasing authorities and employee health), labor unions, professional organizations and governmental agencies utilizing existing data (e.g., material safety data sheets (MSDS), tox profiles and peer-reviewed literature).

Activity/Output Goal 3.3.3: Evaluate the effectiveness of interventions or chemical substitutions that are intended to reduce or minimize exposure and health effects of chemicals, considering impacts on healthcare workers and patients/clients (e.g., via environmental sampling or analyzing medical surveillance data).

Sharps Injuries

Exposures to blood and other body fluids occur across a wide variety of occupations. Preventing these exposures is one important step in ensuring a safe working environment for healthcare personnel and ancillary occupations and complements healthcare systems' patient safety and infection control efforts. Combining strategies for achieving patient safety and worker safety ultimately lead to quality healthcare.

CDC defines healthcare personnel as persons (e.g., employees, students, contractors, attending clinicians, public-safety workers or volunteers) whose activities involve contact with patients or with blood or other body fluids from patients in a healthcare, laboratory or public-safety setting.

The risk to healthcare personnel of exposure to bloodborne pathogens through needlesticks, cuts or other sharps injuries (collectively referred to as percutaneous injuries), as well as through splashes and direct contact with mucous membranes or non-intact skin, is well documented and is associated with the transmission of numerous pathogens, most notably, hepatitis B, hepatitis C, and HIV. The CDC estimates that, each year, 385,000 needlesticks and other sharps-related injuries are sustained by hospital-based healthcare personnel; an average of 1,000 sharps injuries per day. The exact number of sharps injuries among all healthcare personnel cannot be determined for several reasons. There is no national surveillance system to collect these data from non-hospital-based (long-term care, home healthcare, private offices) healthcare personnel. In addition, not all sharps injuries are reported. Surveys of healthcare personnel indicate that 50% or more do not report their injuries.

The majority of exposures to bloodborne pathogens among healthcare personnel are preventable. The following goals were developed to promote the identification and implementation of workplace strategies to prevent sharps injuries among all healthcare personnel.

(For simplicity, throughout this Section, the term "sharps with engineered sharps injury protections" (SESIPs) will be referred to as "safety device" or "safe sharp." It is acknowledged that not all sharps devices with engineered safety features are safer than their traditional counterpart.)

Strategic Goal 4: Reduce sharps injuries and their impacts among all healthcare personnel.

Performance measure: By 2016, surveillance systems will be in place to identify the number and types of healthcare personnel employed in all healthcare settings who sustain sharps injuries and the circumstances, mechanisms, procedures and devices involved in those injuries.

Performance measure: By 2016, the use of safety syringes will be universal, with only 2% of all sharps being conventional needles (e.g. those with no safety alternative) unprotected.

Intermediate Goal 4.1: NIOSH, collaborating with partners, will promote the development and use of surveillance systems that monitor percutaneous injuries among healthcare personnel employed in all healthcare settings.

Activity/Output Goal 4.1.1: Develop and implement surveillance systems to monitor healthcare personnel employed in settings other than hospitals who are at risk for percutaneous injuries.

Activity/Output Goal 4.1.2: Identify the number and types of healthcare personnel employed in settings other than hospitals who sustain percutaneous injuries and the circumstances, mechanisms, procedures, and devices involved in those injuries.

Intermediate Goal 4.2: Promote the development of new and re-engineering of safe sharps with device manufacturers, with a priority on sharps-free alternatives wherever feasible.

Activity/Output Goal 4.2.1: Identify and characterize medical, dental and surgical procedures and techniques for which viable safe sharps do not exist.

Activity/Output Goal 4.2.2: Partner with device manufacturers to ensure that product design involves user feedback.

Activity/Output Goal 4.2.3: Determine the quantity and circumstances of percutaneous injuries while using safety devices and partner with device manufacturers to address engineering failures.

Activity/Output Goal 4.2.4: Promote prevention through design strategies to encourage the development of medical devices that eliminate sharps.

Activity/Output Goal 4.2.5: Work with regulatory agencies and standard-setting groups to establish performance criteria for safety devices that address both worker and patient safety concerns.

Activity/Output Goal 4.2.6: Disseminate performance criteria to manufacturers and users of these devices.

Intermediate Goal 4.3: Promote the use of safety devices among healthcare personnel employed in all healthcare settings.

Activity/Output Goal 4.3.1: Identify pathways by which sharps that are not engineered with safety features enter healthcare environments.

Activity/Output Goal 4.3.2: Partner with medical, nursing, dental and other relevant educational programs to add mandatory sharps safety training in curriculums.

Activity/Output Goal 4.3.3: Collaborate with medical, nursing, dental and other relevant professional associations, as well as worker representative organizations, in encouraging their constituents to be actively involved in selecting, evaluating, prescribing the use of and using safety devices within their scope of practice.

Activity/Output Goal 4.3.4: Collaborate with healthcare facilities and state health departments to establish a standard operating procedure (SOP) that sharps customers and users can follow when they are provided with sharps lacking safety features.

Activity/Output Goal 4.3.5: Identify the reasons healthcare personnel do not use safety devices and, if they are used, why they may not be used properly.

Intermediate Goal 4.4: Increase the rate and accuracy of reporting of percutaneous injuries among all healthcare workers through partnerships with professional associations, unions, and device manufacturers.

Activity/Output Goal 4.4.1: Assess the barriers to accurate reporting.

Activity/Output Goal 4.4.2: Determine strategies to address the barriers.

Activity/Output Goal 4.4.3: Promote the adoption of innovative strategies to improve reporting by healthcare personnel within all healthcare settings.

Intermediate Goal 4.5: Evaluate and improve the utilization of best practices in all healthcare settings to reduce percutaneous injuries.

Activity/Output Goal 4.5.1: Identify, recommend and implement sharps injury prevention strategies based on sharps surveillance data and other information or research.

Activity/Output Goal 4.5.2: Develop strategies to ensure that existing best practices developed for the hospital are translated and used in outpatient and ambulatory care settings (e.g., medical, dental and home healthcare).

Activity/Output Goal 4.5.3: Educate personnel who can train others on best practices for reducing percutaneous injuries.

Activity/Output Goal 4.5.4: Collaborate with The Joint Commission (TJC), CMS, OSHA and other regulatory agencies to enforce the use of safety devices and best practices related to use of sharps.

Intermediate Goal 4.6: Advocate for the establishment, annual update and implementation of a comprehensive exposure control plan that complies with the OSHA Bloodborne Pathogen Standard or relevant state standard, as appropriate, in all healthcare settings.

Activity/Output Goal 4.6.1: Identify the types of healthcare establishments least likely to write, update or implement a written exposure control plan and the reasons for not doing so.

Activity/Output Goal 4.6.2: Partner with relevant professional organizations, associations and unions in encouraging all healthcare establishments to write, update and implement exposure control plans.

Activity/Output Goal 4.6.3: Develop tools to inform frontline healthcare workers of the employers' responsibility for ensuring a safe workplace that includes, but is not limited to, vaccination, provisions for evaluating and selecting safety devices, training and appropriate pre- and post-exposure prophylaxis.

Activity/Output Goal 4.6.4: Develop materials, tools and examples to assist workplaces to develop and implement comprehensive exposure control plans.

Activity/Output Goal 4.6.5: Assess the extent of compliance with the OSHA mandate that frontline workers be involved in the evaluation and selection of devices.

Activity/Output Goal 4.6.6: Develop materials to assist employers, unions, professional groups and frontline workers in implementing meaningful worker participation in evaluation and selection of sharps devices.

Intermediate Goal 4.7: Partner with government agencies and standard setting organizations to incorporate sharps injury prevention into their policies, regulations and guidelines.

Activity/Output Goal 4.7.1: Identify all parties involved with sharps in healthcare, including those related to procurement, reimbursement, use and disposal.

Activity/Output Goal 4.7.2: Work with government agencies and institutions to develop policies and plans that require the use of sharps with safety features.

Infectious Diseases

HCSA workers are at risk for a wide range of occupationally acquired infectious diseases. Many are well known, but new infectious hazards continue to emerge. Depending on the specific pathogen, transmission can occur via direct contact with patients and contaminated surfaces or by exposure to bio-aerosols generated by actions such as sneezing and coughing. These agents can be transmitted naturally or as a result of intentional acts of terrorism. They can occur sporadically or cause epidemic disease and public health emergencies, such as pandemic influenza. It should be noted that protecting HCSA workers also benefits other groups that are potentially exposed to infectious agents in HCSA settings (e.g., patients and visitors).

There are many challenges to stopping transmission of infectious diseases in HCSA settings. Newly emerging pathogens, such as novel agents or already-recognized agents that have become antibiotic-resistant, are important problems. In addition, long-standing problem pathogens (e.g., pertussis) continue to re-emerge. Ease and frequency of global travel rapidly spreads infectious diseases throughout the world. Patients live longer with chronic illnesses, including those that impair their host defense systems and make them susceptible to infectious diseases. Intensive use and misuse of antibiotics drives the emergence of drug resistance. Understaffing of healthcare facilities results in time stress and lack of adherence to preventive measures perceived as time consuming, such as hand washing. Economic stress and insufficiently established safety cultures lead to suboptimal infection prevention and control programs.

The following goals, addressing infectious disease transmission in the HCSA Sector, are organized based on general approaches relevant to many kinds of infectious diseases encountered in healthcare settings. Sharps injuries, an important cause of bloodborne pathogen transmission, are addressed in a separate strategic goal.

Strategic Goal 5: STOP transmission of infectious diseases in HCSA settings among workers, patients and visitors.

Performance measure: By 2016, increase to 70% the influenza vaccination rates among healthcare workers.

Performance measure: By 2016, strategies to overcome barriers for effectively implementing bloodborne pathogens exposure control plans will be available for dental offices and clinics.

The following intermediate goals fall into several groups of major activities; understanding mechanisms and routes, improving approaches to worker vaccinations, improving hand hygiene, improving disinfection and decontamination, identifying and responding to highly infectious exposures, research and adoption of best practices for personal protective equipment (PPE), designing facilities to facilitate appropriate work practices, and incorporating protective engineering controls and improving treatment after hazardous exposures.

Intermediate Goal 5.1: Understanding mechanisms and routes – Investigators across a broad range of disciplines will conduct research to understand mechanisms and determinants of routes by which infectious diseases are transmitted in the HCSA setting.

Activity/Output Goal 5.1.1: Conduct research to develop better exposure assessment methods and apply them to better characterize infectious agent exposure.

Activity/Output Goal 5.1.2: Conduct research to better characterize key issues in infectious disease transmission for important agents in the healthcare setting, including determinants of continued agent viability and infectivity in various media, agent vulnerabilities in various media, relevant host characteristics and dose-infection relationships.

Activity/Output Goal 5.1.3: Conduct research to better understand characteristics associated with airborne transmission, such as quantity and size distribution of aerosols generated by coughing and sneezing, determinants of survival and infectivity in airborne droplet nuclei and virulence after airborne transmission.

Activity/Output Goal 5.1.4: Based on strong scientific foundations, including improved understanding of the amount of dose reduction needed for protection against infectious agents in HCSA settings, develop, study effectiveness of and implement improved mitigation and prevention strategies that utilize a broad range of approaches.

Intermediate Goal 5.2: Improving approaches to worker vaccinations – Investigators, standard-setting organizations and work places will establish policies and practices consistent with CDC and Joint Commission standards and guidelines for vaccination of HCSA workers.

Activity/Output Goal 5.2.1: Assess barriers and develop interventions to increase rates of HCSA workers receiving vaccines against influenza, hepatitis B, whooping cough and other vaccine preventable infectious diseases.

Activity/Output Goal 5.2.2: Target interventions and best practices at under-vaccinated populations and their employers, encouraging them to increase vaccination rates.

Activity/Output Goal 5.2.3: Conduct surveillance for vaccination prevalence at baseline and over time.

Intermediate Goal 5.3: Improving approaches to worker vaccinations – HCSA workers will have access to improved approaches for objectively assessing their immunity to specific pathogens, including biothreat agents and their toxins, by rapid measurement of serum specific antibodies.

Activity/Output Goal 5.3.1: NIOSH will complete a literature review of currently available rapid and/or multiplex serum specific antibody detection technologies for assessing need for vaccine administration or documenting vaccine response, including gaps in science and areas where research funding could be best utilized.

Activity/Output Goal 5.3.2: NIOSH and partners will conduct focused research to improve rapid and/or multiplex serum antibody detection technology of responses to naturally-occurring pathogen, biothreat agent and toxin vaccines.

Activity/Output Goal 5.3.3: NIOSH and partners will develop evidence-based recommendations for use of rapid and/or multiplex serum antibody detection technology to guide preventive interventions, such as vaccination, re-vaccination and workplace restrictions, to avoid specific pathogen exposures.

Intermediate Goal 5.4: Improving hand hygiene – Investigators/industry will conduct research and development on ways to improve hand hygiene compliance.

Activity/Output Goal 5.4.1: Develop devices that facilitate use and optimal application of hand hygiene products (both hand rubs and soaps for hand washing).

Activity/Output Goal 5.4.2: Apply concepts of “Prevention through Design” to develop best practices for buildings and interior design to optimize compliance with appropriate hand hygiene.

Activity/Output Goal 5.4.3: Design and evaluate methods to overcome barriers to facilities providing adequate hand hygiene resources.

Activity/Output Goal 5.4.4: Design and evaluate methods to overcome barriers to healthcare workers using provided hand hygiene resources.

Intermediate Goal 5.5: Improving hand hygiene – HCSA employers will establish policies and practices consistent with CDC and Joint Commission Guidelines to improve hand hygiene compliance.

Activity/Output Goal 5.5.1: Disseminate and implement policies/practices that overcome barriers to facilities providing adequate hand hygiene resources.

Activity/Output Goal 5.5.2: Disseminate and implement policies/practices that overcome barriers to healthcare workers using provided hand hygiene resources.

Activity/Output Goal 5.5.3: Develop a system to measure improvements in adherence to hand hygiene recommendations.

Activity/Output Goal 5.5.4: Evaluate high-risk activities/procedures to target interventions.

Intermediate Goal 5.6: Improving hand hygiene to include appropriate glove use— Investigators will examine outcomes of improved hand hygiene adherence among HCSA workers.

Activity/Output Goal 5.6.1: Assess unintended/adverse/side effects of hand hygiene products (e.g., contact dermatitis, cost-effectiveness).

Activity/Output Goal 5.6.2: Assess impact of improved hand hygiene compliance on healthcare-associated infection rates.

Activity/Output Goal 5.6.3: Assess impact of improved hand hygiene compliance on healthcare worker absenteeism or other measures of healthcare worker illness.

Intermediate Goal 5.7: Improving disinfection and decontamination of surfaces and fomites— Investigators will develop improved approaches to reducing direct contact transmission of infectious diseases by developing improved approaches to disinfection/decontamination of the HCSA environment, including surfaces and fomites.

Activity/Output Goal 5.7.1: Determine the types of infectious agents and conditions where cleaning, decontamination or disinfection is beneficial.

Activity/Output Goal 5.7.2: Determine the types of cleaning agents, decontaminants and disinfectants that optimally balance effectiveness and potential for adverse effects on human and environmental health.

Activity/Output Goal 5.7.3: Determine the optimal approaches to use of cleaners, decontaminants, and disinfectants that maximize effective infectious agent kill and minimize adverse health and environmental effects.

Activity/Output Goal 5.7.4: Clarify the appropriate indications and approaches to bio-decontamination colonized, infected, or contaminated individuals.

Intermediate Goal 5.8: Identifying and responding to highly infectious exposures – HCSA workers will have improved ability to rapidly identify and respond to highly infectious exposures. Examples include patients with contagious diseases able to be transmitted through airborne or casual exposure, such as influenza, SARS or TB (as opposed to patients with diseases not transmitted through casual exposure, such as HIV), as well as fomites or environments contaminated with infectious agents.

Activity/Output Goal 5.8.1: Assess barriers and develop interventions to ensure widespread adoption of currently-recommended approaches to rapidly identify and isolate potentially infectious patients.

Activity/Output Goal 5.8.2: Develop new methods, utilizing modern molecular and antibody-based technologies for rapid identification of pathogens and their toxins in samples derived from patients and HCSA environments.

Activity/Output Goal 5.8.3: Develop evidence-based recommendations for using methods for rapid identification of pathogens and their toxins to protect against transmission of infectious diseases in HCSA settings through identification and isolation of contagious patients or implementation of measures to reduce transmission through HCSA environment.

Intermediate Goal 5.9: Research and adopt best practices for PPE – HCSA facilities will establish and promote a culture of safety where employer and employee commitment to worker safety in general, and the appropriate use of PPE in particular, are strengthened.

Activity/Output Goal 5.9.1: Develop and disseminate training programs which emphasize the correct use (and disposal) of PPE during patient care across HCSA settings.

Activity/Output Goal 5.9.2: Conduct demonstration projects on PPE compliance and use.

Activity/Output Goal 5.9.3: Publish and disseminate broadly the results of these projects to ensure the proliferation of successful PPE strategies.

Activity/Output Goal 5.9.4: Conduct research to improve the understanding of how human factors and behavioral issues related to the ease and effectiveness of PPE use for extended periods of time and during diverse work environments affect PPE use and compliance.

Activity/Output Goal 5.9.5: Develop surveillance of PPE usage to identify priorities, trends and emerging issues associated with the use of PPE in the workplace and use the information to establish a baseline on PPE usage, develop benchmarks and performance measures, sharpen the focus of research efforts and aid in the development of a more effective and active dissemination program.

Intermediate Goal 5.10: Research and adopting best practices for PPE – With a range of partners in the public and private sectors, encourage an integrated effort to fully understand the unique requirements of HCSA workers and to develop innovative materials, technologies and products that can meet their needs, as well as those of their patients.

Activity/Output Goal 5.10.1: Conduct research to better understand the ability of agents to contaminate respirators and transform them into fomites.

Activity/Output Goal 5.10.2: Conduct research to document feasibility and develop practical strategies for decontamination and re-use of respirators without sacrificing filtration performance or fit.

Activity/Output Goal 5.10.3: Conduct research to document the protective differences between various types of PPE using methods that simulate real-life usage and assess all potential leakage paths.

Activity/Output Goal 5.10.4: Respirators utilized in healthcare settings were not designed for that particular venue; research should be conducted to address respirator characteristics germane to healthcare workers, such as speech intelligibility, visibility, hearing and physiological consequences (e.g., impact on workers' carbon dioxide and oxygen levels, etc.) with the goal of identifying features that would enhance respirator performance specific to the healthcare setting.

Activity/Output Goal 5.10.5: Conduct research to explore innovative application of new technologies, such as use of new materials to achieve better “out of the box” fit and reduce need for fit testing, or incorporating sensors into PPE to detect breaches and notify users of end-of-service life and other protection information.

Activity/Output Goal 5.10.6: Conduct research on the frequency of fit testing to assess the rate at which respirator fit changes as a function of time, investigate the factors that affect such change and guide recommendations for frequency and type of fit testing.

Activity/Output Goal 5.10.7: Conduct pre-use check research, investigating the efficacy of user seal checks on filtering facepiece respirators.

Activity/Output Goal 5.10.8: Document existing performance standards and appropriate timing of use for all PPE used by healthcare workers (gowns, gloves, respirators, etc.); conduct a quantitative performance analysis to assess the effectiveness of each type of PPE in reducing the risk of transmission of infectious agents important to the healthcare setting; and use these study findings, combined with surveillance data, to develop enhanced, evidence-based performance requirements.

Activity/Output Goal 5.10.9: Develop innovative approaches to PPE certification that use laboratory, simulated workplace and pre-market workplace testing to achieve a true assessment of PPE effectiveness in the HCSA setting. Adding assessment of additional respirator characteristics to the certification process, such as ability to fit and prevent inward leakage, should also be explored.

Activity/Output Goal 5.10.10: Develop methods to implement pre- and post-market testing of PPE used in HCSA settings to provide ongoing assessment of PPE effectiveness and aid in the continued improvement and evolution of PPE design and use.

Intermediate Goal 5.11: Designing facilities to facilitate appropriate work practices and incorporate protective engineering controls – Investigators/industry will focus on ways to design facilities that reduce infectious disease acquired through airborne, contact, waterborne and multi-route transmission by facilitating appropriate work practices and incorporating protective engineering controls.

Activity/Output Goal 5.11.1: Facility designers will choose wall, floor, ceiling and furniture surfaces that are easy to clean and disinfect.

Activity/Output Goal 5.11.2: Conduct research to identify the positive and negative aspects of carpeting, relative to other kinds of floor coverings, in the reduction of transmission of infections.

Activity/Output Goal 5.11.3: Promote installation and use of alcohol-based hand-rub dispensers by the bed and elsewhere to increase compliance with hand washing protocols.

Activity/Output Goal 5.11.4: Conduct research to determine the importance of the number, location, type (automated vs. manual) and accessibility of hand washing sinks and alcohol-based hand wash gel dispensers, for improving compliance with hand hygiene and washing protocols. Promote installation and use of hand washing sinks and alcohol-based hand wash gel dispensers to increase compliance with hand washing protocols.

Activity/Output Goal 5.11.5: Conduct research to identify the role of human factors in doing hand hygiene compliance research.

Activity/Output Goal 5.11.6: Facility designers and healthcare facilities will use single-bed rooms with private toilets, and greater thoroughness in cleaning after a patient leaves to facilitate optimal isolation practices on high-risk patients.

Activity/Output Goal 5.11.7: Conduct studies of single-patient rooms for their role in contributing to the reduced transmission of infections, in combination with the other interventions noted here.

Activity/Output Goal 5.11.8: Promote construction that favorably impacts air quality, such as high-efficiency particulate air (HEPA) filters, adequate barriers between patient areas and construction areas, negative air pressure in construction zones and properly sealed patient windows.

Activity/Output Goal 5.11.9: Conduct research to identify the relationship between air quality and infection for the purpose of accurately specifying either minimum ventilation and filtration requirements or maximum allowable numbers of spores or other contaminants per cubic meter, in order to prevent the airborne transmission of infections.

Activity/Output Goal 5.11.10: Determine the cost benefit case for the application of sometimes costly air filtration configurations to better understand when higher cost is justified.

Activity/Output Goal 5.11.11: Develop and evaluate engineering control methods to inactivate infectious agents (e.g., UV germicidal irradiation, hydrogen peroxide, copper, or others) and develop and disseminate evidence-based recommendations for their implementation in HCSA settings.

Activity/Output Goal 5.11.12: Facility designers will choose and properly and regularly maintain water systems with proper temperature, pressure and flow provisions for point-of-use fixtures, as well as for decorative fountains.

Activity/Output Goal 5.11.13: Conduct studies to identify the positive and negative aspects of materials, such as furniture coverings, various wall finishes and metals, in reducing the contact transmission of infections.

Activity/Output Goal 5.11.14: Analyze various water fixtures, such as sinks and faucets, for their potential to be reservoirs of pathogenic microorganisms and their possible link to nosocomial infections. Further studies should be done on the proper and effective cleaning of water fixtures to reduce the pathogenic presence.

Activity/Output Goal 5.11.15: Analyze various water fixtures, especially decorative water fountains, for their potential to generate infectious aerosols.

Activity/Output Goal 5.11.16: Conduct research of different combinations of interventions in reducing the transmission of infections in order to better understand the most cost-effective approaches to achieving the greatest reductions of infection transmission rates.

Intermediate Goal 5.12: Improving treatment after hazardous exposures – Prevent development and progression of clinical infectious diseases in HCSA workers through improved approaches to prophylactic treatment after hazardous exposures to pathogens, such as human immunodeficiency virus (HIV), hepatitis B virus (HBV), influenza virus, *Neisseria meningitidis*, *Mycobacterium tuberculosis* and *Bacillus anthracis* (anthrax) spores and through early detection and treatment of disease caused by agents, such as influenza and Hepatitis C virus (HCV).

Activity/Output Goal 5.12.1: Work places will establish and implement policies and practices consistent with current standards and guidelines for post-exposure prophylaxis (PEP) and early detection and treatment of occupationally-acquired infectious diseases in HCSA workers.

Activity/Output Goal 5.12.2: Conduct research to identify barriers to implementation of current standards and guidelines and to develop interventions that address these barriers and increase rates of HCSA workers receiving appropriate PEP and early diagnosis and treatment for occupationally-acquired infectious diseases.

Activity/Output Goal 5.12.3: Conduct research to document the efficacy of PEP and early diagnosis and treatment using currently-recommended and new drug treatment regimens for occupationally-acquired infectious diseases in the HCSA setting.

Activity/Output Goal 5.12.4: Conduct demonstration projects and prevention effectiveness research to demonstrate the effectiveness of programs implementing PEP and early diagnosis and treatment of occupational infectious diseases in the HCSA setting.

Veterinary Medicine/Animal Care (VM/AC)

Veterinary medicine and other animal care personnel (hereafter referred to as VM/AC personnel) are at substantial risk for various occupationally acquired injuries and illnesses, many of which

parallel and even exceed those encountered in human healthcare. In addition, VM/AC personnel face unique risks not found in human healthcare, including injuries by animals (e.g., bites, kicks), veterinary-related reproductive hazards (e.g., veterinary hormones), animal-related respiratory hazards (e.g., animal allergens, endotoxin, ammonia) and zoonotic (animal-to-human) diseases (e.g., brucellosis, rabies). Because of the many parallels to human healthcare and the fact that VM/AC is not specifically addressed in the NORA Agriculture, Forestry and Fishing Sector Agenda or in the Services Sector Agenda (both available at: <http://www.cdc.gov/niosh/nora/>), an agreement was reached to address VM/AC occupational safety and health issues as a part of National HCSA Agenda. This has resulted in the addition of two industries primarily engaged in providing VM/AC services to the HCSA Sector. These are the the Veterinary Services industry (NAICS 541940) and the Pet Care, except Veterinary Services industry (NAICS 812910). The goals described in this Agenda also apply to those who care for animals in several other industries, such as Zoos and Botanical Gardens (NAICS 712130) and those providing VM/AC services in industries that conduct life sciences research. These might be classified under a range of NAICS codes for academic institutions, pharmaceutical or biotechnology companies, etc.

Veterinary Medicine and Animal Care Workers: The HCSA VM/AC workers include those who provide medical, surgical and preventive health services for animals, as well as other workers who provide animal care services ranging from kennel care to laboratory animal care. While the services included in this category are broad, they do not include services provided by farmers, ranchers and other workers covered in the AgFF sector. A partial list of VM/AC occupations includes: veterinarians; veterinary technologists, technicians and assistants; workers in animal shelters and animal control; stable and kennel workers; groomers; and animal trainers.

Many of the following goals apply to zoo workers, even though those who are employed by a zoo are in a different NAICS industry (71213, Zoos and Botanical Gardens), and laboratory animal care workers, who might be employed by a variety of industries. Zoo or laboratory animal care workers who are under contract from an establishment that primarily provides veterinary and/or animal caretaker services are included in the NAICS codes now associated with HCSA. The goals that follow are relevant to all VM/AC personnel regardless of worksite, encompassing academic and public health settings, zoos and nature parks, aquariums, farms, poultry and swine production facilities, meat processing plants, and small, large and exotic animal practices.

Veterinary Personnel Demographics and Industries: VM/AC personnel are employed in numerous industries, including 28,691 establishments delivering veterinary services, 586 zoos, 719 nature parks and 12,080 establishments providing pet care services ([U.S. Census, 2009](#)). [Bureau of Labor Statistics](#) (BLS) data show that there were 442,000 workers in the field, with non-farm animal caretakers (179,000), veterinary technologists and technicians (80,000) and veterinarians (71,000) representing the largest occupational groups (BLS 2011a, BLS 2011b, BLS 2012a). As with other occupations within the HCSA sector, a large percentage of VM/AC personnel are female, including 71% of veterinary technologists and technicians and 56% of veterinarians (BLS, 2010). Veterinarians are often employed by small business; up to 80% of the 59,700 veterinarians in the private sector in 2008 worked in solo or group practices. This limits worker safety and health oversight. Veterinary services ranks 15th among the highest incidence rates for nonfatal occupational injuries and illnesses. Concern for adverse reproductive outcomes in female dominated VM/AC fields, high injury and illness rates among VM/AC personnel and a much faster increase in employment for these occupations by the year 2020 as compared to the

average for other occupations, all underscore the need for research and intervention into the unique health and safety needs of this population (BLS, 2012b).

Occupational Health and Injury Surveillance: Occupational health and injury surveillance — defined as the ongoing tracking of work-related injuries, illnesses, hazards and exposures — is an important need for VM/AC personnel. Although surveillance for work-related fatalities is comprehensive, existing national surveillance systems for tracking nonfatal occupational injuries and illnesses are fragmented and contain substantial data gaps.

Innovative and comprehensive approaches involving multiple data sources are needed to track nonfatal work-related injuries and illnesses. Development of new sources of occupational safety and health surveillance data (e.g., electronic health records that include information on industry and occupation) would improve the ability to conduct ongoing assessment of the work-relatedness of health conditions. A national approach that focuses on the collection of data on work-related hazards, injuries and disease is needed. Robust surveillance data could be used to: 1) identify new and emerging occupational health and safety problems and populations at risk, 2) describe the magnitude and temporal trends of an injury, disease or other health-related event or exposure, 3) guide immediate action for cases of occupational health importance, 4) set priorities for prevention and research activities and 5) evaluate the effectiveness of interventions.

Shared Veterinary and Human Healthcare Issues and Goals:

The inclusion of the VM/AC workers in the NORA HCSA Sector is in concert with the [One Health](#) movement, which seeks to encourage collaboration between professionals from multiple disciplines working locally, nationally and globally to attain optimal health for people, animals and the environment. Occupational safety and health concerns applicable to VM/AC workers include numerous topic areas and goals already identified in this document for human healthcare. Examples of goals that traverse both human and veterinary health are provided below, with one HCSA intermediate goal having priority for VM/AC workers listed under each strategic goal. Other existing intermediate goals could also be adapted and prioritized to reflect veterinary care issues. The associated activity/output goals for the intermediate goals are also applicable to VM/AC workers with slight adaptations. Examples of such goals are also included below.

Safety Culture

HCSA Strategic Goal 1: Promote safe and healthy workplaces to optimize safety culture in healthcare organizations.

Intermediate Goal 1.9: Increase adoption of proven interventions: Promote and increase adoption of comprehensive, coordinated and effective workplace health protection/health promotion programs, policies and practices for improving worker health and safety.

Example Activity/Output Goal: Develop best-practice guidelines for effective workplace health protection/health promotion programs in settings employing VM/AC workers.

Musculoskeletal Disorders

HCSA Strategic Goal 2: Reduce the incidence and severity of musculoskeletal disorders (MSDs) among workers in the HCSA sector.

Intermediate Goal 2.3 (adapted to VM/AC setting): Veterinary care facilities and professional organizations will implement or promote safe handling and movement programs to prevent MSDs among VM/AC personnel.

Example Activity/Output Goal: Explore how known interventions to prevent MSD injuries can be effectively used in the large animal VM/AC setting.

Hazardous Drugs and Other Chemicals

HCSA Strategic Goal 3: Reduce or eliminate exposures and adverse health effects caused by hazardous drugs and other chemicals.

Intermediate Goal 3.1 (adapted to VM/AC setting): Disseminate information regarding potential hazards and best practice guidelines for preventing exposure to hazardous drugs to VM/AC personnel.

Example Activity/Output Goal: Partner with professional organizations to survey members to identify barriers to the safe administration of hazardous drugs in the VM/AC setting.

Sharps Injuries

HCSA Strategic Goal 4: Reduce sharps injuries and their impacts among all healthcare workers.

Intermediate Goal 4.3 (adapted to VM/AC setting): Promote the use of safety devices among VM/AC personnel employed in all work settings.

Example Activity/Output Goal: Identify the reasons VM/AC personnel do not use safety devices and, if they are used, why they may not be used properly.

Infectious Diseases

HCSA Strategic Goal 5 (adapted to VM/AC setting): Minimize transmission of zoonotic and other infectious diseases in healthcare settings among workers, patients and visitors.

Intermediate Goal 5.9 (adapted to VM/AC setting): Research and adopt best practices for Personal Protective Equipment (PPE) – VM/AC facilities will establish and promote a culture of safety where employer and employee commitment to worker safety in general, and the appropriate use of PPE and restraint devices in particular, are strengthened.

Example Activity/Output Goal: Develop and disseminate training programs that emphasize the correct use (and disposal) of PPE and restraint devices for the prevention of zoonotic diseases.

Strategic Goals 6 – 10 Specific to the VM/AC

In addition to the many overlapping goals and issues of the HCSA sector and the VM/AC industries, there are areas where it is useful to have specific goals for improved occupational safety and health for VM/AC workers. Several important areas are detailed below.

Zoonotic Diseases

Strategic Goal 6: Minimize or prevent occupational exposure of veterinary medicine and animal care (VM/AC) personnel to zoonotic diseases.

Intermediate Goal 6.1: Assess the risk of occupational exposure of VM/AC personnel to zoonotic diseases.

Activity/Output Goal 6.1.1: Utilize self-report surveys, seroprevalence surveys and other methods to determine the risk of occupational exposure to zoonotic diseases among different categories of VM/AC personnel in various workplace settings.

Activity/Output Goal 6.1.2: Perform task-based exposure assessment studies of VM/AC personnel to zoonotic agents that have different modes of transmission (e.g., fecal-oral, bloodborne, contact, droplet and airborne).

Activity/Output Goal 6.1.3: Characterize aerosol-generating work activities and determine the potential of these activities to increase the risk of occupational exposure to zoonotic agents

Intermediate Goal 6.2: Promote the adoption of infection control guidelines in all types of VM/AC workplace settings.

Activity/Output Goal 6.2.1: Utilize education venues, training forums and/or publications (e.g., the [*Compendium of Veterinary Standard Precautions for Zoonotic Disease Prevention in Veterinary Personnel*](#)) to raise awareness and improve infection control practices in VM/AC workplace settings.

Activity/Output Goal 6.2.2: Partner with professional organizations to develop and promote guidelines, model infection control programs and educational materials that can be easily adapted for implementation in a variety of VM/AC workplace settings.

Activity/Output Goal 6.2.3: Identify and publish case studies of zoonotic disease exposures or infections in VM/AC personnel in various workplace settings to raise awareness of the importance of effective infection control measures.

Activity/Output Goal 6.2.4: Conduct studies or surveys, such as health hazard and environmental assessments, to document barriers faced by VM/AC personnel in adopting and consistently implementing effective infection control measures.

Activity/Output Goal 6.2.5: Evaluate and assess the economic benefits of implementing comprehensive infection control programs in various VM/AC workplace settings, possibly through partnerships with insurance companies.

Injury Hazards

Strategic Goal 7: Reduce the occurrence of the most common injury hazards among VM/AC personnel

Common injuries reported in the literature include bites, scratches, being kicked or crushed by large animals and musculoskeletal, injuries including strains and back injuries.

Intermediate Goal 7.1: Promote best practice prevention measures to reduce animal-inflicted injuries.

Activity/Output Goal 7.1.1: Identify or develop best practice prevention measures to reduce animal-inflicted injuries.

Activity/Output Goal 7.1.2: Encourage the practice of prevention measures by disseminating best practices through partnerships with professional organizations and veterinary medical institutions and postings of the practices on existing websites (e.g., NIOSH, American Veterinary Medical Association, Veterinary Information Network).

Intermediate Goal 7.2: Identify and address barriers to preventing animal-inflicted injuries.

Activity/Output Goal 7.2.1: Convene focus groups of VM/AC personnel to identify barriers to using prevention measures.

Activity/Output Goal 7.2.2: Identify and/or develop new engineering controls as well as other prevention/preventative methods that may be viable in the VM/AC setting.

Activity/Output Goal 7.2.3: Utilize education venues, training forums and publications to describe the (identified) barriers to best practices as well as the available mechanisms to reduce or eliminate them.

Respiratory Hazards and Diseases

Strategic Goal 8: Minimize or prevent occupational exposures to respiratory hazards and resulting adverse health effects among veterinary medicine and animal care (VM/AC) personnel.

Exposure to respiratory hazards that can affect the respiratory tract and other target organs is common among VM/AC personnel. Animal allergies and asthma are common respiratory diseases caused by such exposures. Ongoing surveillance is needed to document the burden of exposures to respiratory hazards and resulting adverse health effects in various VM/AC work settings and to track progress in applying primary and secondary prevention measures.

Intermediate Goal 8.1: Assess the burden of exposures to respiratory hazards and resulting adverse health effects in the VM/AC subsector.

Activity/Output Goal 8.1.1: Develop a program of health surveillance and hazard assessment to track the burden of asthma and allergic disease and the exposures to respiratory hazards that cause them in VM/AC personnel.

Activity/Output Goal 8.1.2: Across a range of VM/AC work settings, perform task-based exposure assessments to respiratory hazards targeting the respiratory tract, such as high molecular weight animal allergens, including those in dander, urinary proteins and saliva, and other substances that might cause or exacerbate allergic respiratory disease, such as endotoxins, animal derived-irritants (ammonia from urine, etc.) and chemical agents, such as cleaners and disinfectants.

Activity/Output Goal 8.1.3: Across a range of VM/AC work settings, perform task-based exposure assessments to respiratory hazards with direct toxicity to the respiratory tract (e.g., formaldehyde, glutaraldehyde) or using the respiratory tract as a portal of entry to mediate systemic effects (e.g., chloramphenicol, DMSO, hydrogen sulfide).

Activity/Output Goal 8.1.4: Across a range of VM/AC work settings, determine the impact of engineering and administrative controls and PPE on exposure of VM/AC personnel to respiratory hazards.

Activity/Output Goal 8.1.5: Across a range of VM/AC work settings, conduct trials to demonstrate efficacy and effectiveness of a comprehensive range of primary and secondary prevention measures.

Intermediate Goal 8.2: Promote adoption of best practices to reduce exposures to respiratory hazards and resulting adverse health effects in the VM/AC subsector.

Activity/Output Goal 8.2.1: Disseminate updated guidance consistent with that found in the National Institutes of Health *Laboratory Animal Allergy Prevention Program* <http://www.ors.od.nih.gov/sr/dohs/Documents/LAAPP.pdf> to prevent work-related asthma/allergy in laboratory animal workers

Activity/Output Goal 8.2.2: Use educational venues and training forums to raise awareness of respiratory hazards and their adverse health effects (e.g., work-related asthma/allergy) and the benefits of prevention among VM/AC personnel and their employers.

Activity/Output Goal 8.2.3: Partner with professional organizations to promote model prevention programs to reduce exposures to respiratory hazards and prevent their adverse health effects in various VM/AC work settings.

Reproductive Hazards and Impacts

Strategic Goal 9: Reduce potential reproductive hazards and their impacts among VM/AC personnel.

Performance Goal: By 2016, develop a list of recommended practices and distribute fact sheets on potential VM/AC workplace reproductive hazards to at least 20 veterinary medical colleges.

Intermediate Goal 9.1: Raise awareness among VM/AC personnel about occupational reproductive hazards to encourage adoption of best practices.

Activity/Output Goal 9.1.1: Develop a list of recommended practices to mitigate the major occupational reproductive risks encountered in VM/AC practice, including radiation safety, anesthetic gas administration practices, work hours and safe handling of veterinary drugs/hormones/pesticides.

Activity/Output Goal 9.1.2: Develop fact sheets addressing reproductive hazards that could be disseminated through professional organizations and veterinary medicine colleges.

Activity/Output Goal 9.1.3: Develop continuing education materials and/or programs targeted to VM/AC personnel to reduce risk of exposure to reproductive hazards.

Intermediate Goal 9.2: Promote best practices, including the implementation of administrative controls, engineering controls and use of PPE, to reduce exposures to ionizing radiation in the VM/AC setting.

Activity/Output Goal 9.2.1: Survey veterinarians and/or convene focus groups of veterinarians and technicians to identify barriers to implementing best practices to reduce exposure to ionizing radiation related to the use of diagnostic radiographic equipment.

Activity/Output Goal 9.2.2: Conduct on-site health hazard evaluation surveys, using occupational health and health physics experts, to evaluate exposure levels and work practices in a variety of VM/AC settings. Such surveys could be conducted through the [health hazard evaluation](#) program or through [extramural research](#) programs.

Physical Hazards

Strategic Goal 10: Reduce physical hazards and their impacts among VM/AC workers.

Intermediate Goal 10.1: Improve approaches to reducing noise exposure in VM/AC settings.

Activity/Output Goal 10.1.1: Conduct hazard evaluations to document noise exposure in VM/AC and identify best practices for remediating noise exposure.

Activity/Output Goal 10.1.2: Survey veterinarians and/or convene focus groups of VM/AC personnel to identify barriers to implementing noise control measures or hearing protection.

Activity/Output Goal 10.1.3: Identify low-cost engineering controls or other measures to reduce noise exposure in veterinary care establishments.

Activity/Output Goal 10.1.4: Develop training and model program materials, possibly through the adaption of existing materials, that could be disseminated to VM/AC settings.

Intermediate Goal 10.2: Promote awareness of heat stress and cold hazards in various VM/AC settings.

Activity/Output Goal 10.2.1: Develop or adapt educational materials to improve awareness of heat stress and measures to reduce risk tailored to the VM/AC setting.

Activity/Output Goal 10.2.2: Partner with professional veterinary organizations to help disseminate information on heat stress and hypothermia.

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