Safe Patient Handling and Mobility Guidebook

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Table of Contents

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Executive Summary

Lifting and moving heavy loads increases the potential for injury for both the employee and the patient. Direct patient care providers complete tasks on a daily basis that require handling, lifting, and mobilizing patients, which increases the risk of musculoskeletal injuries. Due to the increased cost of lifting and repositioning injuries to employees, medical organizations and national regulating bodies, such as the American Nurses Association (ANA) and the Food and Drug Administration (FDA), have developed and provided guidance in the form of staff education, policies, and procedures to help reduce the risk of injuries. Safe Patient Handling and Mobility (SPHM) Programs have proven effective in reducing employee injuries; benefits have also included improvements in patient safety, decreased falls, increased strength, and decreased skin breakdown/impairments, and improvements in other negative healthcare outcomes related to immobility.

The purpose of this guidebook is to provide best practice guidance to develop, implement, and maintain an effective SPHM Program that minimizes the incidence and severity of job-related injuries related to SPHM activities. Derived from best practices within and outside of health care, the program elements described in this guidebook have been tested and are being fully implemented within Veterans Health Administration (VHA). Ideally, an interdisciplinary team composed of key stakeholders should develop the program, obtain/maintain administrative support and funding, provide oversight of program implementation, monitor progress, and evaluate outcomes. Please note that best practice guidelines and tools for care of persons of size are not included in this guidebook, but are addressed in a stand-alone guidebook entitled Veterans Health Administration (VHA) Bariatric Safe Patient Handling and Mobility Guidebook: A Resource Guide for Care of Persons of Size.

It is evident that SPHM Programs will continue to evolve; however, the instruments within this guidebook can serve as invaluable resources for both caregivers and patients, leading to safer environments of care today.

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Each guidebook has three sections:

- **Preface:** Disclaimers, Executive Summary *(summary of how this book supports each program)*, Acknowledgements, How to Use This Guidebook, Update Listing *(list of any online updates made to the guidebook prior to a new publication),* and Acronyms and Abbreviations, *(list of acronyms and abbreviations used in the guidebook).*
- **Chapter Contents:** Each chapter contains a general discussion that provides VA-specific guidance on the topic.
- **Additional Reference Materials:** Enclosures and Appendices. *(Enclosures are provided in a generic format, to be edited and used by individual facilities. Examples include templates, forms, samples, tools, and checklists.)*

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References and Web site links within each chapter and enclosure/attachment were current at the time of publication.

Update Listing

The following listing identifies online updates since the initial publication of the January 2016 edition of this guidebook. It is designed to assist the reader in verifying the most current information available.

Update Number	Date Updated	Remarks	Chapter
1	June 2016	Updated National Association of Orthopaedic Nurses (NAON) Algorithms and Clinical Tools for Safe Patient Handling in an Orthopaedic Setting.	5

Acronyms and Abbreviations

Acronym/ Abbreviation	Definition
AAR	After Action Review
ADA	Americans with Disabilities Act
ADL	Activities of Daily Living
ADPCS	Associate Director for Patient Care Services
ANA	American Nurses Association
AORN	Association of periOperative Registered Nurses
ARR	Average Relative Risk
ASISTS	Automated Safety Incident Surveillance Tracking System
BDOC	Bed Days of Care
BIRN	Back Injury Resource Nurses
BLS	Basic Life Support
BLS	Bureau of Labor Statistics
BMI	Body Mass Index
BNA	Bureau of National Affairs
BSN	Bachelor of Science in Nursing
CBA	Cost Benefit Analysis
CCL	Clinical Care Leader
CCNE	Commission on Collegiate Nursing Education
CCR	Compensation Case Rate
CCU	Critical Care Unit
CDC	Centers for Disease Control and Prevention
CE	Clinical Educator
CEOSH	Center for Engineering & Occupational Safety and Health

Acronym/ Abbreviation	Definition
CL	Ceiling Lift
COR	Contracting Officer's Representative
CPR	Cardiopulmonary Resuscitation
CPRS	Computerized Patient Record System
CPT	Current Procedural Terminology
CRI	Composite Risk Indicator
CSR	Compensation Severity Rate
CT	Computerized Tomography
CTOP	Competency, Training, Orientation, Performance
DART	Days Away/Restricted or Job Transfer Rate
DCP	Direct Care Provider
DoD	Department of Defense
ED	Emergency Department
EES	Employee Education System
EMS	Emergency Medical Service
EMS	Environmental Management Service
ERM	Enterprise Risk Management
EWL	Electronic Wait List
EWO	Electronic Work Order
FC	Facility Coordinator
FDA	Food and Drug Administration
FGI	The Facility Guidelines Institute
FRD	Friction-Reducing Device
FTEE	Full-Time Employee Equivalent

Acronym/ Abbreviation	Definition
FY	Fiscal Year
HAIG	Healthcare Analysis and Information Group
HAPU	Hospital-Acquired Pressure Ulcer
HR	Human Resources
IOM	Institute of Medicine
IRR	Internal Rate of Return
ISO	International Organization for Standardization
IWS	Index of Worker Satisfaction
kg	Kilogram
kg/m^2	Kilograms per Meters Squared
LBP	Low Back Pain
lb.	Pound
LPN	Licensed Practical Nurse
LTC	Long Term Care
LTC	Lost Time Case
MCM	Medical Center Memorandum
MDS	Minimum Data Set
MICU	Medical Intensive Care Unit
ml	Milliliter
mm	Millimeter
MRI	Magnetic Resonance Imaging
MSD	Musculoskeletal Disorder
MSI	Musculoskeletal Injury
MSN	Masters' of Science in Nursing
NA	Nursing Assistant

Acronym/ Abbreviation	Definition
NAON	National Association of Orthopaedic Nurses
NCPS	National Center for Patient Safety
NE	Nursing Education
NHCU	Nursing Home Care Unit
NIOSH	National Institute for Occupational Safety and Health
NLNAC	National League for Nursing Accrediting Commission
Nm	Newton Meter
NM	Nurse Manager
NMQ	Nordic Musculoskeletal Questionnaire
NRC	National Research Council
OHSAH	Occupational Health & Safety Agency for Healthcare
ONS	Office of Nursing Services
OPH	Office of Public Health
OPM	Office of Personnel Management
OR	Operating Room
OSHA	Occupational Safety & Health Administration
OT	Occupational Therapy
OWCP	Office of Workers' Compensation Programs
PAG	Professional Advisory Group
PCC	Patient Care Coordinator
PCE	Patient Care Ergonomic
PM	Program Manager
POC	Point of Contact

Acronym/ Abbreviation	Definition
PR	Public Relations
PSCI	Patient Safety Center of Inquiry
PT	Physical Therapist/Therapy
QE	Qualified Evaluator
RCA	Root Cause Analysis
RFI	Request for Information
RME	Reusable Medical Equipment
RN	Registered Nurse
ROI	Return on Investment
SICU	Surgical Intensive Care Unit
SIG	Special Interest Group
SOP	Standard Operating Procedure
SOW	Statement of Work
SPH	Safe Patient Handling
SPHM	Safe Patient Handling and Mobility
SPHP	Safe Patient Handling Provider
SPHS	Safe Patient Handling Score
STP	Strategic Training Plan
TAG	Technical Advisory Group
TED	Thromboembolic Device
TIRR	Total Injury Report Rate
TMS	Talent Management System
UPL	Unit Peer Leader
U.S.C.	United States Code
VA	Department of Veterans Affairs

Acronym/ Abbreviation	Definition
VACO	VA Central Office
VAMC	VA Medical Center
VHA	Veterans Health Administration
VISN	Veterans Integrated Service Network
VISTA	Veterans Health Information Systems and Technology Architecture
WC	Workers' Compensation

Overview

1.1. Purpose

This guidebook provides information and tools to create, implement, and maintain a Safe Patient Handling and Mobility (SPHM) Program with the overall goal of reducing the incidence and severity of job-related injuries related to these activities. While the knowledge, technology, and program practices of SPHM are constantly evolving, the instruments within this guide include the basics and state-of-the art SPHM practices. They can serve as resources for caregivers, patients, and an organization, ultimately leading to safer working environments. Derived from best practices within and outside of health care, the program elements described in this guidebook have been tested and are being fully implemented within the Veterans Health Administration (VHA). Similar programs have been developed in the private sector. Through the use of this systematic approach, data derived from VHA and outside organizations show decreases in the frequency, severity, and costs associated with such injuries to caregivers. Additionally, more and more evidence points to improvements in patient quality of care and safety.

1.2. Target Audience

This resource guide will provide a wealth of information for:

- SPHM facility coordinators (FCs).
- SPHM unit peer leaders (UPLs).
- Caregivers in all clinical areas involved in direct patient care and patient handling, movement, and mobilization.
- Facility-based interdisciplinary teams responsible for improving the safety of both caregivers and patients during the performance of patient handling and mobility tasks.
- Risk managers, occupational health staff, safety officers, ergonomic experts, quality managers, administrators, and others who influence workplace safety and support resources for SPHM Programs.

1.3. SPHM Resources Developed by VHA

Over the years, VHA designed, developed, and eagerly shared their SPHM Program resources with outside entities. The very first resource released by VHA was the *Patient Care Ergonomic (PCE) Resource Guide,* developed in conjunction with the Department of Defense (DoD). The guide you are now reviewing is a major revision of that *PCE Resource Guide*. Other original resources are listed below and can be found at http://www.tampavaref.org/safe-

patient-handling.htm. This updated guide includes revisions of many of the original VHA resources. These are noted with an asterisk.

- Ergonomic Workplace Evaluations of Patient Care Areas Process*
- Patient Handling and Mobility Technology Resource Guide
- Patient Assessment Criteria and Algorithms for Safe Patient Handling and Mobility*
- Equipment Selection, Storage, and Maintenance Best Practices
- Clinical Area/Unit-Based Peer Leader (UPL) Programs*
- Safety Huddle Process*
- SPHM Policy Template*
- Bariatric SPHM Toolkit* (Note: This Toolkit is now the 2015 VHA Bariatric Safe Patient Handling and Mobility Guidebook: A Resource Guide for Care of Persons of Size and is found at the VHA Center for Engineering & Occupational Safety and Health (CEOSH) Web site.)
- Slings Toolkit

1.4. History of VHA SPHM Program Elements

Many experts within and outside of VHA, as well as nationally-recognized researchers, have designed comprehensive programs to eradicate job-related musculoskeletal injuries in nursing, therapy, diagnostics, and other health care departments where patient transfer, assistance, and mobility occur.

The VHA program elements discussed below were originally included in the highly successful Safe Patient Handling and Movement Program Implementation Study designed by Audrey Nelson, PhD, RN, FAAN (Nelson et al., 2006). Her research examined successful national and international studies to determine which program elements had the best chance for success and could be easily implemented. Her team carefully selected interventions from England, the military, and non-health care industries. They designed this program to facilitate provider acceptance as well as knowledge transfer throughout the VHA and health care industry. When the VHA implemented Nelson's SPHM Program nationally, the program elements were further developed and modified based on professional consensus and laboratory evidence.

The original SPHM Program elements follow and are discussed at length within chapters of this guide. Please note, a structured phase-in of these program elements was and still is critical. (1) *Patient care ergonomic evaluations* (Chapter 3) were conducted initially to determine technology requirements. (2) *Technology (safe patient handling equipment)* was identified and introduced. Equipment purchases focused on ceiling lifts because they were determined to be the key

technology for reducing risk from patient handling tasks. They were the primary purchases for all VHA facilities over an average time period of 3 to 5 years. Other patient handling equipment was also considered necessary and provided: bariatric lifts, air-assisted lateral transfer devices, motorized stretchers, friction-reducing devices, and other technology. See Chapter 4, Safe Patient Handling and Mobility Equipment: Categories and Evaluation/Selection. (3) While equipment was being identified and introduced, *SPHM Unit Peer Leader (UPL) Programs* (Chapter 7) were being implemented. The original VHA UPLs were known as Back Injury Resource Nurses (BIRNs), however, since the SPHM Program encompasses more than nurses and body parts other than the back are involved in injuries, the name was changed to SPHM UPLs. UPLs have proven effective in initiating and maintaining effective culture change within the VHA. (4) The *Patient Assessment, Algorithms, and Care Plan* tools were implemented simultaneously with introduction/training on technology so information was not lost among caregivers. Importantly, now and then, in order for staff to implement these tools properly, appropriate SPHM technology must be in place and easily accessible. UPLs were instrumental in implementing these tools. (5) *Safety Huddles*, formerly known as After Action Reviews (AARs), were introduced during the start-up of the UPL Program as a way to initiate knowledge transfer within clinical units/areas. See Chapter 8, Safety Huddles.

1.5. Overview of Content

Below is a summary of chapter content. The previous VHA/DoD Patient Care Ergonomic Guidelines included chapters on SPHM and bariatric patients and also a chapter on lift teams. This guidebook does not incorporate either. A comprehensive Bariatric Safe Patient Handling and Mobility Guidebook is available on the VHA CEOSH Web site. The consensus of the authors was to not include a chapter on lift teams.

- *Chapter 2, Background,* includes a brief description of the causes of and problems surrounding musculoskeletal injuries from handling, moving, and mobilizing patients. Several myths and facts related to SPHM are relayed.

- *Chapter 3, Patient Care Ergonomic Assessment Process,* presents a protocol for conducting ergonomic assessments of patient care environments that will provide direction as to what patient handling equipment and SPHM Program elements and improvements are necessary to decrease the risk of caregiver injuries while handling, moving, and mobilizing patients.

- *Chapter 4, Safe Patient Handling and Mobility Equipment: Categories and Evaluation/Selection*, outlines SPHM equipment categories. In addition, the process of equipment evaluation is explained and helpful tips are offered on evaluating space and area needs prior to the purchase and introduction of SPHM technology.

- *Chapter 5, Patient Assessment, Algorithms, and Care Planning for Safe Patient Handling and Mobility*, describes and provides tools that assist in

patient assessment/screening, algorithms/scoring methods to select equipment that meet the handling and mobility needs of individual patients, and a care planning process.

- *Chapter 6, Safe Patient Handling and Mobility Facility Coordinator,* discusses the history of the Department of Veterans Affairs (VA) SPHM FCs, their roles and responsibilities, modalities that overcame training and education barriers related to inclusion in a VA system-wide program, FC support, FC extracurricular activities, and the relationship of FCs to operational program outcomes

- *Chapter 7, SPHM Unit Peer Leaders (UPLs),* outlines the importance of UPLs in a successful SPHM Program. It also details UPL roles, responsibilities, and limitations. Additionally, the importance of leadership engagement and processes to monitor effectiveness are discussed.

- *Chapter 8, Safety Huddles*, relays the importance of Safety Huddles in addressing and communicating SPHM concerns, process issues, and facilitating knowledge transfer surrounding employee and patient injuries and near misses, and other safety issues. Guidelines are suggested regarding the structure of Safety Huddles as well as benefits and limitations of the Safety Huddle process. Tools and strategies for implementation are also provided.

- *Chapter 9, Training Program to Prevent Musculoskeletal Injuries in Caregivers,* outlines the key components of designing an effective SPHM Training Program. This includes the importance of education within a safe patient handling environment, culture change, and assessing the audience and level of competence. The VHA SPHM Training and Education Strategic Plan, VHA SPHM FC development materials, as well as competency validation tools are provided.

- *Chapter 10, Developing a Safe Patient Handling and Mobility Policy,* addresses important elements to include in an SPHM policy as well as a policy template that can be modified to meet the needs of different organizations.

- *Chapter 11, Program Evaluation and Outcome Measures,* delineates tools for monitoring progress and evaluating outcomes.

This guidebook was designed to include proven tools to assist teams in implementing strategies that can improve employee and patient safety related to patient handling and mobility tasks. Ideally, an interdisciplinary team will include key stakeholders who develop the facility SPHM Program, obtain/maintain administrative support and funding, provide oversight of program implementation, monitor progress, and evaluate outcomes.

Background

2.1. Introduction

Lifting and moving heavy loads increases the potential for injury for both the employee and the patient. Direct patient care providers complete tasks requiring the lifting and movement of patients on a daily basis, which increases the risk of musculoskeletal injuries. Due to the increased cost of staff lifting and repositioning injuries, medical organizations and national regulating bodies, such as the American Nurses Association (ANA) and the Food and Drug Administration (FDA), have attempted to enact guides, staff education, policies, and procedures to reduce the risk of musculoskeletal injuries. Though Safe Patient Handling and Mobility (SPHM) Programs have proven effective in reducing employee injuries, benefits in an effective program have also included improvements in patient safety, decreased falls, increased strength, decreased skin breakdown, and improvements in other negative health care outcomes related to immobility. By utilizing this resource guide, organizations will also be able to reduce the risk and severity of lifting and repositioning injuries, decrease workers' compensation costs, decrease staff fatigue, and increase staff morale and quality of life.

This chapter will evaluate the prevalence of musculoskeletal injuries among health care providers, review common myths and facts in relation to patient handing, and relay studies relevant to the movement of patients. Lessons learned from Veterans Health Administration (VHA) facilities are also included within this chapter.

2.2. Background

Expanding knowledge regarding the risk of injury to the health care profession when moving and handling patients has provided a solid background for the introduction of SPHM Programs. In 2013, the most frequent national, nonfatal occupational injuries and illnesses were within health care and social assistance, representing 668,300 injuries and 45,200 illnesses [Bureau of Labor Statistics (BLS), 2013]. The most frequent 2013 national nonfatal occupational injuries and illnesses requiring days away from work and transfer or light duty, again, were within health care and social assistance, representing 198,040 and 134,200 cases respectively (BLS, 2013). In 2011, 22 percent of injuries were related to over-exertion in lifting or lowering of patients, causing 36 percent of back, 12 percent of knee, and 12 percent of shoulder injuries (BLS, 2013).

One study has shown that nursing staff lift as much as 1.8 tons within a typical 8-hour shift (Tuohy-Main, 1997). A meta-analysis review of 987 studies concluded that the odds ratio of low back pain was between 1.2 and 5.5, depending upon the definition of low back pain (Yassi & Lockhard, 2013). Randall, et al. (2009) reported results from a facility's Occupational Safety & Health Administration (OSHA) 300 Log that demonstrated a relationship with obesity-related injuries.

Their study found that although the patients with a body mass index (BMI) greater than or equal to 35 kilograms per meters squared (kg/m^2) made up less than 10 percent of the patient population, they accounted for 31 percent of turning and repositioning reported cases, 29.8 percent of injuries, 27.9 percent of lost time, and 37.2 percent of light duty (Randall, Pories, Pearson, & Drake, 2009).

Transferring patients from a bed to a wheelchair or a commode chair to a hospital chair manually, using the one-person hug, two-person hook and toss, and two-person gait belt techniques exceed the safe limit of compressive forces on the spine, with several of the above techniques exceeding the maximum tolerance of the spinal structure. Repositioning patients with one- or two-person techniques results in compression force above the safe limit, with many approaching the maximum tolerance limit. The study concluded, based on manually lifting a 110 pound (50 kg.) female patient, that it is not safe to manually lift or move a patient. A lifting device to facilitate safe transfers must be used (Marras, Davis, Kirking, & Bertsche, 1999). More recently, Waters (2007) determined that 35 pounds is the maximum weight any caregiver should lift under the best of circumstances. Further discussion related to this is found in Section 2.3, Ergonomic Standards.

The cost of musculoskeletal injuries can be astronomical. According to the Institute of Medicine Report from the Committee on Advancing Pain Research, Care, and Education (2011), total cost of pain on society is from $560-645 billion annually. This includes the cost of health care and reduced productivity. The annual treatment cost increased by 65 percent over 8 years (Martin, et al., 2008). Additionally, only 40-50 percent of inter-body cage lumbar fusion (a type of back surgery) provided pain relief and improved quality of life (Lacaille, Deberard, Masters, et al., 2005).

Multiple studies have indicated that safe patient handling practices within a health care organization can reduce the rate and/or severity of lifting and repositioning injuries.

Further studies have evaluated characteristics of the type of lift used and the impact of forces on the spine, and ultimately lifting and repositioning injuries. Ceiling lifts decrease spinal compression and shearing forces to those within safe lifting limits. With the use of floor-based lifts, there is still a chance of intervertebral disc injuries from anterior/posterior shearing, though significantly reduced from not using a lift at all. Anterior/posterior shearing can be elevated above the safe limit while in tight spaces and with general motion and turning (sharp and gradual). When comparing floor-based lifts among each other, increased risk is noted with small wheels versus large wheels and carpeted floor versus solid floor (Marras, Knapik, & Ferguson, 2009).

2.3. Ergonomic Standards

The National Institute for Occupational Safety and Health (NIOSH) provided the scientific basis for safe practices for lifting and handling in the United States (Waters, Putz-Anderson, Garg, & Fine, 1993). The 1994 Revised NIOSH Lifting

Equation sets the maximum recommended weight limit at 51 pounds under ideal conditions. The 51 pound limit was for lifting boxes, lumber, and other materials; however, it expressly states that this lifting equation is not particularly applicable where tasks involve elements of holding, pushing, and pulling, and specifically, tasks related to patient lifting (Waters, Putz-Anderson & Garg, 1994). Studies that did apply the NIOSH lifting guidelines to nursing practice found the estimates of compressive force to the spine were all above the action limit permitted as safe (Nelson, 1996; Owen & Garg, 1991). Later, Waters (2007) adapted the NIOSH Lifting Equation for patient lifting and handling tasks. He determined that 35 pounds is the maximum weight a caregiver can lift or move while performing patient handling and lifting of a patient's body, head, or appendages. He noted that this 35 pound limit was applicable only under the best of circumstances and should be decreased if other factors impact the activity, such as patient contractures, presence of lines and tubes, behavior, and others (Waters, 2007).

The ANA (2013) published *Safe Patient Handling and Mobility, Interprofessional National Standards* that cover eight benchmarks that should be addressed by medical organizations in relation to SPHM Programs and practices. These standards include:

1. Establishing a culture of safety.
2. Implementing and sustaining an SPHM Program.
3. Incorporating ergonomic design into the environment of care.
4. Selecting, installing, and maintaining SPHM technology.
5. Establishing an education system and ensuring competence.
6. Utilizing patient-centered assessment tools, plan of care, and technology.
7. Providing a means to accommodate the injured employee post-injury.
8. Establishing a system to evaluate the SPHM Program.

2.4. Common Myths and Facts about SPHM

Myth: Education and training are effective in reducing injuries.

Facts: Although it was widely accepted that classes in body mechanics and training in lifting techniques prevent job-related injuries, more than 35 years of research dispute this belief. These efforts have consistently failed to reduce the job-related injuries in patient care delivery (Anderson, 1980; Brown, 1972; Buckle, 1981; Dehlin, Hedenrud, & Horal, 1976; Hayne, 1984; Owen & Garg, 1991; Snook, Campanelli, & Hart, 1978; Stubbs, et al., 1983; Venning, Walter, & Sitt, 1987; Wood, 1987). There are several reasons why training alone is not effective, including the following:

1. Body mechanics training is based on research that is not likely generalizable to nursing practice.
2. It is difficult for nurses to translate classroom content to direct patient care.
3. Experts do not agree on what proper body mechanics include.
4. Manual patient handling tasks are intrinsically unsafe because they are beyond the biomechanical capabilities of the general work force.

Therefore, traditional injury prevention programs based primarily on training and attempts to modify behavior of workers have not demonstrated success.

Interestingly, body mechanics for safe lifting were based on research conducted with predominantly male subjects who lifted boxes vertically from the floor. While we have been teaching nurses "proper" body mechanics, it took years before it was questioned whether this research could be generalized to nursing. Why? Nursing was and is a predominantly female profession. Furthermore, the science of body mechanics applies to vertical lifting. Many nursing tasks are accomplished in a lateral rather than vertical plane (e.g., moving a patient from a bed to a stretcher). Ironically, using the "proper" body mechanics for lateral transfer of a patient may actually predispose a nurse to a higher level of risk.

The volume of lifting, turning, pulling, and positioning of patients leads to fatigue, muscle strain, and ultimately, injury. Unlike lifting a box that has handles, a patient lift is much more difficult. A patient's weight is not evenly distributed, and the mass is asymmetric, bulky, and cannot be held close to the body. Furthermore, patient handling tasks are unpredictable; patients can be combative, experience muscle spasms, or suddenly lose their balance. The amount of assistance a patient can offer at any point in time will vary, making the task somewhat different each time it is performed.

Furthermore, the hospital or home environment adds to the complexity of patient handling and mobility tasks. Access to patients can be very difficult because of clutter around a bedside or small spaces, such as a bathroom. It can be very difficult for nursing staff to position themselves properly when trying to assist a dependent patient with toileting activities. Patient rooms are often crowded and awkward postures are often required when trying to gain access to a patient in a bed. The environment in which nurses care for patients can be very unpredictable and is constantly changing.

Education and training have not been effective because experts do not agree about the content of these initiatives. To date, lifting techniques have had limited value in hospital settings, primarily due to time, comfort, or safety issues. Experts do not agree on which lifting techniques are optimal for nursing tasks (Owen & Garg, 1991; Venning, et al., 1987). Owen (1985) identified the discrepancies by experts in identifying effective lifting techniques, addressing studies by Jones (1973), Brown (1973), Hipp (1976), Dukes-Dobos (1977), and Chaffin (1975).

Proper lifting techniques have often failed to consider one or more of the following:

1. Balance was virtually ignored when nurses were taught to lift loads from below the level of the knees in the position of flexed knees, with the back straight.

2. Not all stressful patient handling tasks are lifts; however, techniques have focused exclusively on this task (Owen & Garg, 1990). Investigations show that 20-30 percent of the working time is spent in a position with a forwardly bent or twisted trunk during activities, such as bathing or dressing and undressing the patient.

3. Techniques have failed to consider that lifting, turning, and repositioning of patients often must be accomplished on a lateral plane, using the weaker muscles of the arms and shoulders as primary lifting muscles, rather than the stronger muscles of the legs.

4. The patient is asymmetric, bulky, and cannot be held close to the body; patient handling tasks are often unpredictable and can be complicated by patients who are uncooperative, combative, or severely contracted.

Therefore, education and training on body mechanics alone, for a variety of reasons, have not been effective in reducing injuries. Additional biomechanical evaluations are needed to address optimal lifting and patient handling techniques for caregivers and nursing staff.

Myth: Back belts are effective in reducing risks to caregivers.

Facts: Back belts were widely used in the 1990s as a strategy to prevent job-related injuries in nursing. However, there is no evidence these belts are effective (NIOSH 1996).

Back belts have been used by a variety of industries. They are made of a lightweight, breathable material normally having double-sided pulls that allow varying degrees of tightness and pressure. Those promoting the use of back belts claim they:

- Reduce internal forces of the spine during forceful exertions of the back.
- Increase intra-abdominal pressure, which may counter the forces on the spine.
- Stiffen the spine, which may decrease forces on the spine.
- Restrict bending motions.
- Remind the wearer to lift properly.

- Reduce injuries in certain work places.

In the comprehensive studies done by NIOSH, it is stated that these claims remain unproven. Lifting may produce a variety of forces within the body that contribute to the overall force acting on the spine from compressive, lateral, and anterior-posterior components, termed spinal loading. Many of the studies NIOSH reviewed sought to examine the impact of back belt use of loading. None of the studies provide sufficient data to indicate that industrial back belts significantly reduce loading during lifting. Loading on the spine increases when a person has to bend as far forward as possible. Some feel if the ability to bend could be restricted by a back belt, the risk of injury might be decreased. Although, back belts restrict range of motion during side-to-side bending and twisting, it was found that they do not have the same effect when a worker bends forward, as is the case in many patient lifting tasks. Regarding the claim that back belts remind workers to lift properly, there is little scientific evidence to support this. There have been anecdotal case reports of injury reduction at work places where back belts have been used. However, many companies that have instituted Back Belt Programs have also implemented Training and Ergonomic Awareness Programs. The report of injury reduction may be related to these or other factors. On the basis of available evidence, the potential effectiveness of back belts in reducing the occurrence of low back injuries remains unproven. There has been some concern that wearing a back belt may increase the potential for injury. A nurse may believe that he or she can lift more wearing a back belt. If nurses falsely believe they are protected, they may subject themselves to even greater risk by lifting more weight than they are capable of handling.

Myth: Mechanical lifts are not affordable.

Facts: The long-term benefits of proper equipment far outweigh costs related to nursing work-related injuries. In nine case studies evaluating the impact of lifting equipment in health care facilities, the incidence of injuries decreased from 60-95 percent, workers' compensation costs decreased by 95 percent, insurance premiums dropped 50 percent, medical and indemnity costs decreased by 92 percent, lost work days decreased by 84 percent-100 percent, and absenteeism due to lifting and handling was reduced by 98 percent (Bruening, 1996; Fragala, 1993; Fragala, 1995; Fragala and Santamaris, 1997; Logan, 1996; and Villaneuve, 1998). Introduction of lifts in Department of Veterans Affairs (VA) facilities resulted in a nearly 40 percent reduction in patient handling injuries between fiscal year (FY) 2006 and FY 2012 (Hodgson, Matz, & Nelson 2013), confirming results from the initial VA SPHM Implementation study in 2001-2002, which saw a 30 percent decrease in injuries, an 18 percent decrease in lost time injuries, and a 70 percent decrease in modified duty days while improving worker satisfaction, feelings of professionalism, and decreasing perception of workload. The return on investment (ROI) from introduction of lifts and other equipment was 4.1; however, most studies show an ROI of around 2.0 (Nelson, et al., 2006).

As these studies show, the purchase of lifting devices benefits the facility, patient, and nursing staff. A higher quality of work life for health care workers results from occupational injury risk reduction, which translates into improved quality of care for the patient due to higher staff productivity and reduced turnover. These improved patient outcomes and quality of care also result in cost reductions to the organization.

Myth: Use of mechanical lifts eliminates all the risk of manual lifting.

Facts: While lifting devices minimize risk, unfortunately the risk cannot be eliminated altogether. Even when using lifting equipment, significant force may be required to insert the sling or friction-reducing device (FRD). Furthermore, human effort is needed to move, steady, and position the patient. However, since most injuries in nursing are cumulative, any steps to minimize risks in key nursing tasks will offer substantial benefits.

Myth: High-risk tasks in nursing are restricted to lifting patients.

Facts: Not all stressful tasks in nursing are patient lifts. Many manual patient-handling tasks are performed in a forwardly-bent position with a twisted trunk, such as feeding, bathing, or dressing a patient. Additionally, high-risk tasks completed on a horizontal plane are common. These tasks include lateral transfers from bed to stretcher or tasks that involve repositioning a patient in bed. Owen & Garg (1990) identified 16 stressful manual patient handling tasks in nursing. The most stressful tasks identified in rank order included:

1. Transferring patient from toilet to chair.
2. Transferring patient from chair to toilet.
3. Transferring patient from chair to bed.
4. Transferring patient from bed to chair.
5. Transferring patient from bathtub to chair.
6. Transferring patient from chair lift to chair.
7. Weighing a patient.
8. Lifting a patient up in bed.
9. Repositioning a patient in bed side-to-side.
10. Repositioning a patient in a chair.
11. Changing an absorbent pad.
12. Making a bed with a patient in it.
13. Undressing a patient.

14. Tying supports.

15. Feeding a bed-ridden patient.

16. Making a bed while the patient is not in it.

Furthermore, Nelson (1996) and colleagues identified the following nursing tasks as high-risk:

1. Bathing patient in bed.
2. Making an occupied bed.
3. Dressing a patient in bed.
4. Transferring a patient from bed to stretcher.
5. Transferring from bed to wheelchair.
6. Transferring from bed to dependency chair
7. Repositioning a patient in a chair.
8. Repositioning a patient in bed.
9. Applying anti-embolism stockings (T.E.D.™ hose).

Myth: Facilities should standardize the patient handling equipment across all units.

Facts: Standardizing the patient handling equipment has great appeal to purchasers for four reasons: (1) the slings are interchangeable, (2) maintenance is easier, (3) buying larger quantities usually results in price discounts, and (4) caregiver familiarity with one type of equipment results in more confidence, and thus, compliance in use, resulting in better patient handling outcomes. Standardization also has great appeal to nursing administration, in that training is easier and there is less of a problem with staff competency in using equipment when they are floated between units.

A disadvantage to standardization is that the equipment selected may not meet the needs of all staff and patients. Patient characteristics, physical environment, and staff acceptance should influence the purchase and may result in variations across patient care areas. Buying the wrong equipment for a unit in the spirit of standardization may mean staff will not use it. A more reasonable approach is to standardize among like units; e.g., critical care, long-term care, or medical/surgical, noting any unique aspects of units. Note: This is usually not applicable to purchase of lifting equipment. There are many benefits to standardization (noted above) and few, if any, benefits to purchasing from different manufacturers.

Myth: If you buy equipment and devices for SPHM, staff will use them.

Facts: Fragala (1993) identified several reasons why patient-handling equipment has failed in the past, including equipment that is neither patient- nor user-friendly and is unstable, hard to operate, difficult to store, not easily accessible or available, and poorly maintained. There are several strategies for avoiding costly equipment purchase errors. First, include staff in making the selection. This can be accomplished through an equipment fair or small clinical trial of equipment in the patient area where it will be used. It is important to include all staff that will be expected to use the equipment.

Another mistake commonly made is to purchase manual equipment rather than slightly more expensive powered versions. When making decisions about whether or not to use a lifting device, a caregiver balances the amount of effort required with the amount of extra time it will take. Slight improvements to minimize effort can result in an increased number of staff members that use the equipment, making powered devices more cost effective. Overhead lifts can further minimize effort, maximize availability, and increase usage.

Other common mistakes are to purchase insufficient quantities of devices or slings, locate the lifts inconveniently, or fail to adequately maintain equipment. The way that nurses organize their work assignments must be carefully considered. Patient lifting tasks are not evenly distributed throughout a 24-hour period. Often, there are peak periods where staff must compete for lifting devices. If the expectation is that staff will use equipment to reduce risk, there should be a commitment to purchase sufficient quantities so this is feasible. Furthermore, few health care facilities have adequate and conveniently-located storage space. Developing a plan for placement of equipment is critical to success. Additionally, a plan for routine service/maintenance is needed. This includes not only the motor and frame, but also cleaning of the equipment, laundering of the slings, and a plan for sling and battery replacement.

Myth: If you institute an SPHM policy, nurses will stop lifting.

Facts: Policy alone does not change practice. In order to institute an SPHM policy successfully, the infrastructure must first be shaped to support the policy, including the provision of sufficient quantities of appropriate technological solutions and support structures, such as facility program managers, unit peer leaders (UPLs), and educational and program materials to make compliance easier.

Myth: Various lifting and patient handling equipment and devices are equally effective.

Facts: Operation of some lifting devices can be as stressful as manual lifting. Equipment needs to be evaluated for ergonomics as well as user acceptance. In a study conducted to redesign at-risk nursing tasks, Nelson, et al. (2001) found that lifting devices were not intuitive, and staff had difficulty using some equipment

as it was designed. A biomechanical evaluation of friction-reducing devices showed statistically significant differences in spinal loading between products, where cost was not predictive of effectiveness (Lloyd & Baptiste, 2006). Lifting devices that require manual pumping to raise the lift can be stressful to shoulders and may be more stressful than a two-person manual transfer. Specialty hospital mattresses, designed to reduce patient risk for pressure ulcers, have been shown to increase caregiver exertion by 17 percent by allowing the patient to sink low into the mattress and reducing access to the patient (Nelson, et al., 2001).

Myth: Nurses who are physically fit are less likely to be injured.

Facts: Multiple studies have explored characteristics of the nurse that affect the risk of back injury. The underlying assumption of this research is that staff could be screened for employment or placed in jobs based on level of risk. This approach, viewed by many as discriminatory, has not been successful. Some personal risks factors have been identified as height (Dehlin, Hedenrud, & Horal, 1976) and obesity (Gold, 1994; Lagerstrom, Wenemark, Hagberg, & Hjelm, 1995; Patenaude & Sommer, 1987). Contradicting obesity as being a risk factor, in a prospective cohort study of 961 female hospital nurses, Smedley, et al. (1997) found no relationship between BMI and the development of low back symptoms. According to the National Research Council (NRC)/Institute of Medicine (IOM) (2001), biomechanical loading and physiologic tolerance, genetics, psychological, psychosocial, and organizational (job satisfaction and sense of control), as well as individual (age, sex, perception of pain), can all have an impact on risk of injury to the lower back. Nurses with a previous history of back injury are deemed at higher risk for re-injury (Fuortes, Shi, Zhang, Zwerling, & Schootman, 1994). Some health-related behaviors and habits might, to some extent, confound associations between occupational injury and low back pain, including drug/alcohol consumption (Bigos, et al., 1986; Manning, Leibowitz, Goldberg, Rogers, & Newhouse, 1984) and cigarette smoking (Frymoyer, et al., 1980; Frymoyer, et al., 1983; Heliovaara, Knekt, & Aromaa, 1987; Kelsey, 1975; and Kelsey, et al., 1984).

According to Marras, et al. (1999), factors other than biomechanical loading and physiologic tolerance can play a role in the risk of musculoskeletal injury due to their effects on muscle activity and spinal loading. Psychosocial stress, gender, and personality traits have an impact on the functioning of the body and the ensuing spine load. Psychosocial stress provided an increased risk for spinal compression and lateral shear in some, but not all, subjects. When evaluating gender, women's anterior-posterior shear forces increased in response to stress; whereas men's decreased. There were also some personality traits that were associated with an increased spine load when compared with those with opposing personality traits. This study provided insight into the effect of psychosocially stressful environments in conjunction with affected personality traits, increasing the risk of spinal loading, and thus, the risk of low back disorders.

Intuitively, it would seem that nurses who were more physically fit would be injured less, although the literature does not support this. Why? These staff members are exposed to risk at a greater level; co-workers are more likely to ask stronger, fitter peers for help. Older, frailer nurses are less likely to be injured since co-workers rarely ask them to assist with lifting, they are less likely to be assigned heavy patients, and often co-workers cover for them.

Observations at the James A. Haley Veterans' Hospital in Tampa revealed that social relationships on a unit predicted staff members that were at risk for a job-related injury as well as the number of workdays lost when an injury occurred. Specifically, nurses that were well-integrated on a unit were able to secure assistance from peers easier and more quickly than staff members who were marginally accepted. In addition to staff members who were not well liked or respected by peers, other staff who had difficulty securing assistance included new staff and staff who floated to the unit. Once an injury occurred, staff members who had positive relationships with their nurse manager were more likely to return to work sooner than staff members with poorer relationships with management.

Myth: The majority of manual patient handling tasks do not cause an injury.

Fact: Every time force is applied beyond the physical capabilities of the body, micro-tears will occur in muscles and in the intervertebral discs (Marras, Knapik, & Ferguson, 2009). These micro tears scar, preventing nutrients from penetrating the discs, thus leading to degenerative disc disease. Injuries that seem sudden may actually be the result of cumulative trauma.

Myth: Using SPHM technology takes more time than manual methods.

Fact: SPHM technology can require fewer staff, meaning that if the equipment is readily available, it can be faster than waiting for multiple staff to do the same task manually. Time trials among trained staff members can also demonstrate that transfer and repositioning tasks can be faster with equipment than with multiple staff members that need to be brought together. And of course, staff members who are hurt are less able to help with manual methods or even to be present at the bedside. Alamgir, et al. (2009) also found that transfers performed with overhead lifts required less time than floor-based lifts and were found to be more comfortable for patients.

2.5. Successful Implementation Strategies

Facilities that have developed and implemented ergonomic-based Injury Prevention Programs using effective technology have achieved considerable success in reducing work-related injuries and costs. Studies show that ergonomic approaches have reduced staff injuries from 20-80 percent, significantly reduced workers' compensation costs, and reduced lost time due to injuries (Hodgson, et al., 2013; Nelson, et al., 2006; Bruening, 1996; Bureau of National Affairs (BNA), 1993; Fragala, 1993; Fragala, 1995; Fragala, 1996; Fragala & Santamaria, 1997;

Logan, 1996; “Sacrificial Lamb Stance,” 1999; Villaneuve, 1998). Furthermore, several researchers, over more than 35 years, have concluded that there is little evidence to suggest that intensive training in lifting techniques and biomechanics has decreased back injuries among direct care providers (Anderson 1980; Brown, 1972; Dehlin, et al., 1976; Lagerstrom, et al., 1995; Stubbs, et al., 1983a). Table 2-1 summarizes ergonomic intervention case studies.

Fragala & Fragala (2014) state that in 2009, 252 cases out of 10,000 full time health care workers suffered musculoskeletal disorders. This was seven times the national rate of musculoskeletal disorders from all occupational groups. Direct caregivers are the ones who are at the greatest risk for injury (Fragala & Fragala, 2014). In 2012 there was a decrease in these numbers. Health care workers sustained 42 percent of all occupational injuries, with a rate of 55 cases out of 10,000 full time workers. This rate was 56 percent higher than all other occupational industries (BLS, 2013).

Table 2-1: Summary Table of Ergonomic Interventions

Location/Authors	Study Description/ Intervention	Results
(Holtermann, Clausen, Joregensen, et al., 2015)	Studied 1,478 female healthcare workers with no low back pain at start of study; observed those who developed low back pain (LBP).	An increased risk of low back pain is associated with infrequent use of safe patient handling lifting devices. No association between frequent use of device and LBP.
Denmark eldercare facilities. (Andersen, Burdorf, Fallentin, Persson, Jakobsen, Mortensen, Clausen, & Holtermann, 2014)	Prospective study of female caregivers in eldercare using baseline and follow-up questionnaires asking about frequency of performing patient handling tasks, previous back injury/pain, use of assistive devices, and frequency of transferring patients alone without assistance from other caregivers. Follow-up asked respondents if they had injured their low back on the job in the past 12 months.	Daily patient transfer was associated with increased risk for back injury among healthcare workers. Persistent use of an assistive device was associated with reduced risk for back injury among healthcare workers with daily patient transfers.

Location/Authors	Study Description/ Intervention	Results
Rehabilitation hospital (Alperovitch-Najenson, Treger, & Kalichman, 2014)	Comparison of prevalence of work-related musculoskeletal complaints and working conditions between physical therapists and nurses. Compared LBP rate in 26 physical therapists (PTs) vs. 54 nurses in a Rehabilitation Hospital.	LBP was more prevalent in PTs than nurses. Conclusion: should initiate a no-lift policy.
All VHA facilities; all clinical areas where patient handling, movement, and mobility occurs. (Powell-Cope, et al., 2014).	Comprehensive Safe Patient Handling and Mobility (SPHM) Program, including equipment, training, UPLs, facility coordinators (FCs), national program manager, design guidelines, policy, and SPHM algorithms, implemented throughout all VHA hospitals, long term care (LTC), and clinical areas/units.	The multi-component SPH Program was effective in reducing the risk for patient handling-related musculoskeletal injuries among nurses, particularly among high-risk units where it is most needed. Findings from this study provide convincing evidence to support SPHM Programs.
All VHA facilities; all clinical areas where patient handling, movement, and mobility occurs. (Hodgson, Matz, & Nelson, 2013).	Comprehensive SPH Program, including equipment, training, UPLs, FCs, national program manager, design guidelines, policy, and SPHM algorithms, implemented throughout all VHA hospitals, LTC, and clinical areas/units.	Data support the idea that in organizations that provide strong support, an important, industry-altering initiative (SPHM Program) can be designed, pilot tested, and rolled out nationally, with major improvements in injury rates; become an industry standard; and fundamentally change a hazard without a regulatory component.
(Yassi & Lockhard, 2013)	Systematic review of literature considered 987 studies; 89 studies met eligibility criteria. Bradford Hill considerations used (Mix of 21 longitudinal, 36 cross-sectional, 23 biomechanical/ergo, and 9 review studies).	Patient handling confers the highest risk; other duties confound dose response. Associations were strong, consistent, temporally possible, plausible, coherent, and analogous to other exposure outcomes.

Location/Authors	Study Description/ Intervention	Results
Veterans Integrated Service Network (VISN) 8 Nursing Homes and Spinal Cord Injury Units. (Nelson, Matz, et al., 2006)	Comprehensive SPHM Program, including equipment, training, UPLs, site coordinators, policy, SPHM algorithms, and safety huddles.	This program aided both patients and nursing personnel (registered nurses, licensed practitioner nurses, and nursing assistants). Incidence and severity of injuries to health care workers decreased. Improvement in job satisfaction and general satisfaction with use of equipment by patients and caregivers were seen. The intervention also was cost effective.
VISN 8 Nursing Homes and Spinal Cord Injury Units. (Siddharthan, Nelson, Tiesman, & Chen, 2006)	Comprehensive SPH Program, including equipment, training, UPLs, site coordinators, policy, SPHM algorithms, and safety huddles.	The intervention was cost effective. A cost-benefit analysis showed that net benefits from lowered incidence and severity of injuries and decreased workers' compensation claims were $200,000 per year in 23 units in VISN 8. The payback period of the initial investment in patient handling equipment was 4.3 years with an Internal Rate of Return (IRR) near 19 percent.
Long-term care facilities. (Collins, Wolf, Bell, & Evanoff, 2004)	''Best practices'' Musculoskeletal Injury Prevention Program consisting of mechanical lifts and repositioning aids, a zero lift policy, and employee training on lift usage.	Significant reduction in injuries for full-time and part-time nurses in all age groups, all lengths of experience in all study sites.

Location/Authors	Study Description/ Intervention	Results
Acute care hospitals and long-term care facilities. (Evanoff, Wolf, Aton, Canos, & Collins, 2003)	Introduced mechanical lifts in acute care hospitals and LTC facilities.	Implementation of patient lifts can be effective in reducing occupational musculoskeletal injuries to nursing personnel in both LTC and acute care settings. Strategies to facilitate greater use of mechanical lifting devices should be explored, as further reductions in injuries may be possible with increased use.
Northern Virginia Training Center (Werner, 1992)	Mechanical lifts on four high-risk units.	73 percent reduction in injuries.
Kennebec Health System (BNL, 1993)	Ergonomic Management Program; engineering controls, including lifting devices.	Lost workdays dropped to 48 from 1,097. Experience modification factor dropped from 1.8 (worse than average) to 0.69 (better than average). Insurance premiums dropped from $1.6 million to $770,293.
Texas hospital (Fragala, 1995)	Lifting equipment.	Workers' compensation costs for back injuries declined from $111,159 to $743.
Long-term care facility in Connecticut (Fragala, 1996)	Ergonomics-based Back Injury Prevention Program, including lifting devices.	74 percent reduction in back injuries over a 3-year period. Workers' compensation costs $4500 vs. $174,412 pre-intervention. Lost workdays reduced from 1025 to 81.
United Kingdom (Logan, 1996)	Equipment for manual handling, Ergonomics Program for all aspects of hospital work systems.	Reduction in injuries among caregivers; 84 percent decrease in lost work hours. Absenteeism due to lifting and handling reduced 98 percent.

Location/Authors	Study Description/ Intervention	Results
Lawrence and Memorial Hospital (Fragala and Santamaria, 1997)	Lifting aids on two high-risk units.	Occupational injuries improved approximately 80 percent. Lost work days decreased from 69 to 0. Restricted workdays decreased from 133 to 6.
Quebec nursing facility (Villaneuve, 1998)	Ceiling-mounted lifts	Number of lost-time injuries dropped from 26 to 6.5 per year. Annual average lost days dropped from 983 to 67.
Maine facility ("Sacrificial Lamb Stance," 1999)	Policy for no manual lifting	Drop in medical and indemnity costs from $75,000 to $5,600.

As these studies show, ergonomic programs make sense and provide opportunities to create win/win situations. When health care facilities apply innovative approaches to injury prevention, they benefit themselves, patients, and their caregivers. A higher quality of work life for health care workers results from occupational injury risk reduction, which translates into improved quality of care for the patient due to higher staff productivity and reduced turnover. These benefits can be achieved through a well-designed SPHM Program. VHA was the first large health care system to adopt this sound ergonomic approach to enhance safety and health.

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EOSH

Patient Care Ergonomic Assessment Process

3.1. Introduction

The purpose of this chapter is to present a protocol for conducting ergonomic assessments of patient care environments that will provide direction as to what patient handling equipment and Safe Patient Handling and Mobility (SPHM) Program elements and improvements are necessary to decrease the risk of caregiver injuries while handling, moving, and mobilizing patients. Additionally, patient mobility, quality of care, and outcome measures are found to be positively impacted. A patient care ergonomic assessment is an integral part of an SPHM Program.

Manual patient handling tasks are intrinsically unsafe because they are beyond the capabilities of the general work force; therefore, traditional Injury Prevention Programs based primarily on training and attempts to modify behavior of workers have not demonstrated widespread success.

The key to effective SPHM Programs is the use of ergonomic-based approaches that analyze job tasks and identify prominent risk factors with the purpose of changing unacceptable job demands. Ergonomic approaches are used to:

1. Design jobs and job tasks to fit people rather than expecting people to adapt to poor work designs.
2. Achieve a proper match between the worker and their job by understanding and incorporating the limits of people.
3. Take into account that when job demands exceed the limits of workers, there are problems.

The greatest hazard in patient handling is the force imposed on the musculoskeletal system of the caregiver. Patient handling equipment reduces the injurious forces that result from performing patient handling and mobility tasks. The tasks that exceed the biomechanical capabilities of the caregiver are ergonomic hazards and put the caregiver at risk for injury (acute or cumulative trauma). Important techniques to reduce ergonomic hazards in healthcare include modifying the work area and introducing technology, such as patient handling equipment. The introduction of such equipment helps to decrease or eliminate the impact that manual handling has on the caregiver; therefore, reducing staff injuries (Cohen, et al., 2010).

When performing manual patient handling tasks, the biomechanical capabilities of the body are exceeded and result in acute and cumulative trauma injuries to the

muscles and to the spine (Hodgson, Matz, & Nelson, 2013). Waters (2007) determined that manual lifting of more than 35 pounds of a patient's body weight, under the best of circumstances, can cause musculoskeletal injuries. Although the majority of patient handling injuries are cumulative, most are recorded as acute injuries. Cumulative stress on muscles can cause micro-tears to accumulate over time and can result in a seemingly acute injury (Hodgson, Matz, & Nelson, 2013; Cohen, et al., 2010). However, acute injuries do occur. An example of an acute musculoskeletal injury (MSI) is when an ambulated patient falls and the caregiver attempts to catch them, resulting in a dislocated shoulder. Excessive spinal loads can also cause serious injuries. There are two forces that act on the spine when lifting and moving patients: compressive and shear forces. Compressive forces occur while lifting heavy loads and lifting even light loads for a sustained period of time. Shear forces result from twisting and bending or reaching and pulling. Spinal loading and stress are increased when performing patient handling tasks that involve holding loads away from the caregiver's body (Marras, Knapik, & Ferguson, 2009; Rice, Wooley, & Waters, 2009). To minimize risk of injury, the load (patient) should be kept as close as possible to the body's center of mass (Hodgson, Matz, & Nelson, 2013). This positioning is not always easy or even possible in caregiving environments. For these many reasons, ergonomic control measures, e.g., patient handling technology, must be put in place to decrease the risk from patient handling tasks.

Once an injury-related risk (manual patient handling task) is identified in the workplace, Occupational Safety & Health Administration (OSHA) recommends that it be analyzed and a method developed to improve the job. Through the principles of ergonomics, high-risk patient handling tasks are redesigned and improved to be within the limits of human capabilities. Ergonomics is not a magical solution though, and to be effective, a well thought out Ergonomic or SPHM Program must be developed to support patient handling technology selection, use, and maintenance.

3.2. Patient Care Ergonomic Assessment Process

A site visit team, or in some cases a single evaluator, will perform an ergonomic analysis of each clinical unit/area to determine what improvements can be instituted to decrease risk. These recommendations will be made based on a walk-through (site visit) of each area, interviews with management and other staff, and through the evaluation of clinical unit/area-specific information. In order to have a smooth and productive site visit, information should be collected and submitted to the site visit team or evaluator prior to their visit. In order to give management adequate time to locate and compile information, the pre-site visit data collection tools found in Step 1 and Step 2 below should be given to the clinical unit/area manager/supervisor for completion at least a few weeks prior to the site visit. This pre-site visit data should be submitted to the site visit team or evaluator at least 1 week in advance of the site visit.

The Patient Care Ergonomic Assessment process includes the four steps below and is an adaptation of an ergonomic assessment developed by Guy Fragala, PhD, PE, CSP, CSPHP (Fragala, 1996):

- Step 1: Identify High-Risk Tasks
- Step 2: Collect Information on the Physical Environment, Patient Characteristics, Staffing
- Step 3: Conduct Team Site Visit/Walk-through Ergonomic Assessment
- Step 4: Generate Recommendations

3.2.1. Step 1: Identify High-Risk Tasks

It is critical to identify high-risk tasks in order to make accurate patient handling technology recommendations. Transfers (to and from bed to chair, chair to toilet, chair to chair, car to chair), positioning/repositioning, mobilization and ambulation, transfer of patient off the floor, wound care, showering/bathing, surgical procedures, vehicle extractions, and patients presenting special challenges (bariatric and combative patients) are considered high-risk patient handling tasks (Cohen, et al., 2010). Other high-risk tasks include ergonomic hazards, such as performing tasks that require twisting, bending, reaching, holding body parts for long periods of time, standing for long periods of time, pushing, pulling, awkward postures, repetitive motions, and others.

High-risk tasks can cause musculoskeletal impact/stress on the back, shoulders, neck, wrist, hand, knees, and other body parts (Hodgson, Matz, & Nelson, 2013). It is difficult to determine the exact amount of weight handled by a caregiver when lifting a patient or assisting a person to stand. It is even more difficult when more than one caregiver is involved with performing the task. Patient care can be unpredictable at times due to unanticipated patient responses (muscle spasms, combativeness, or resistance). These things can result in unexpectedly heavy loads. Patient movement can cause loading/stress on the spine that increases beyond what it would be for a slow, smooth lift of a stable object (Waters, 2007).

The highest-risk tasks are likely to vary between patient care units/areas and depend on patient characteristics, availability of equipment, physical layout, and work organization. For example, while some clinical units/areas may identify lateral transfers from bed to stretcher or turning patients from side to side in bed as the highest-risk tasks in their clinical unit/area, others may identify lifting patients as the highest risk.

High-risk tasks can be identified through review of injury data, use of surveys, and staff interviews. Each is discussed below.

3.2.1.a. Review Clinical Unit/Area Injury Data

Provide this data prior to site visit.

Injury data focuses on injuries related to patient handling, movement, and mobility. Importantly, each clinical unit/area should gather and record their individual information. Facility-wide data is not sufficient because patient populations vary, and technology needs will differ within each clinical area/unit.

There are several methods for collecting injury data. The most commonly used is retrospective review of injury/incident reports and OSHA Logs. Unfortunately, it is often difficult to understand the etiology of risk using retrospective injury data collection methods. For example, incident reports may not include critical information about staffing levels, whether equipment was being used, and other contributing factors. Prospective data collection, defined as collecting data as each injury occurs, allows you to ascertain details while the person is able to easily recall details.

Data should minimally capture a description of the incident, including the patient care activity performed at the time of the injury (bathing, repositioning, transfer from bed to chair, etc.), cause of injury (pull, push, reach, etc.), type of injury (sprain/strain, contusion, etc.), time of the incident, unit/location where incident occurred, body part(s) affected, days of work lost, and modified duty days. A sample Patient Care Incident/Injury Data Collection Tool is found as Enclosure 3-1. Typically, at least one year of data is collected and analyzed so that trends can be identified. Analysis should be performed by clinical unit/area to characterize each. Unit analysis will minimally address the incidence, severity (defined as lost and modified duty days), primary task(s) involved in injuries, and the primary cause(s) of injuries on the unit. Identifying the primary cause(s) of injuries as well as the primary tasks performed when injuries are occurring will provide direction when making ergonomic (equipment) recommendations. Time of injury will identify potential work shift issues. For instance, in one unit, many injuries were occurring during the night shift while not during the day. Through staff interviews it was found that the unit had one battery for their lift and it was charged during the night, leaving the night shift with no lift. The simple solution was to purchase an additional battery for use at night.

3.2.1.b. Conduct Staff Perception of High-Risk Tasks Survey

Conduct this survey prior to site visit.

An excellent survey was developed by Owen and Garg (1991) to determine staff perception of high-risk tasks. The survey relays a suggested list of high-risk tasks that can be refined to match tasks carried out in a clinical unit/area by adding or deleting tasks in the list. The survey takes into account the perceived difficulty (stress) of a high-risk task and the frequency of completing the task. The survey respondent then uses these scores to rank the task in overall difficulty. See Enclosure 3-2 for the tool for prioritizing high-risk patient handling tasks.

This survey can be used to assist in determining what SPHM technology is necessary in a particular clinical unit/area. It can be used to conduct a pre/post intervention study and also as an educational tool. As noted, the information from

this survey can be used to determine what tasks are perceived by staff to be risky and then used to help make technology recommendations during an ergonomic assessment. Since the initial survey is conducted prior to introduction of patient handling equipment, the survey can be repeated again after 6 months, a year, or 2 years, and comparisons can be made that may indicate the degree of compliance in use of the new equipment and success of SPHM Program implementation in a clinical unit/area. The survey can be completed individually by staff in a clinical unit/area or in groups of staff on a specific unit. If done individually, responses must be tallied using only those from a single clinical unit/area or shift within the area. Whether completed individually or by a group, this survey has great benefit as an educational tool. Simply considering the degree of risk when conducting each task provides awareness that the job of being a caregiver is a hazardous one. When caregivers accept the risk in their jobs, they are more likely to do what is necessary to protect themselves, i.e., use SPHM technology.

Caregiver opinion regarding factors contributing to injuries can also be collected through the use of simple staff surveys. An open-ended staff survey asking staff something like: "What is contributing to the injuries occurring on your unit?" may bring up significant issues, such as lack of equipment, equipment maintenance and repair, storage, staffing, or problems with modified duty assignments.

3.2.1.c. Interview Staff

Interviews of frontline staff are one of the most significant and accurate methods to obtain data related to patient characteristics in a clinical unit/area. These interviews are conducted in person, during the site visit walk-through of the unit. The greater the number interviewed, the more precise the data, but talking with only a few well-versed staff members can be just as useful. It is recommended to interview staff independently from management. The presence of management may inhibit free flow of ideas and discussions of patient handling or equipment use in the clinical area. Staff members from each specific clinical unit/area that is being evaluated should be interviewed separately.

During the site visit interview(s) with frontline staff, document the requested information in the Patient Care Ergonomic Evaluation Staff Interview Tool (Enclosure 3-3) (Hodgson, Matz, & Nelson, 2013). Additionally, note staff attitudes toward the SPHM Program and initiatives, patient handling issues/concerns, and physical environment issues/concerns (such as high thresholds or lack of space to use floor-based lifts in bathrooms).

3.2.2. Step 2: Collect Clinical Unit/Area-Specific Information on the Physical Environment, Patient Characteristics, Staffing, and Existing Equipment

Provide this information prior to site visit.

Enclosure 3-4 is the Pre-Site Visit Clinical Unit/Area Profile. *Part I* of this tool describes the unit and includes information on space, storage, structure, and

equipment maintenance/repair issues. *Part II* collects information related to the patient population and staff.

While most of the questions on this survey are self-explanatory, one area of Part II, physical dependency levels of patients, may need additional explanation. Physical dependency related to patient handling, movement, and mobility is not the same as patient acuity. Definitions of levels of dependency are included in Enclosure 3-4. To determine the percentage of patients on these units who are totally physically dependent as related to patient handling, movement, and mobility, include percentages of both total dependent and extensive assistance patients. A resource for determining dependency levels in long-term care settings is the most recent Minimum Data Set (MDS) 3.0. The MDS coding is consistent with Activities of Daily Living (ADL) Self-Performance Codes for a patient's functional level over all shifts during the observation period. Although MDS definitions can be used in other patient-care areas, alternative approaches to determining dependency levels may be needed.

The Existing Equipment/Condition/Use Form (Enclosure 3-5) lists existing equipment, condition, and use. This tool confirms data gathered during site visit and provides a global picture of the clinical area/unit under investigation. These two tools are also used for making equipment and program recommendations (Hodgson, Matz, & Nelson, 2013).

3.2.3. Step 3: Conduct Ergonomic Assessment Site Visit/Walk-Through

Following identification of high-risk tasks and accumulation of other necessary information from a specific clinical unit/area, the patient care ergonomic assessment team is convened for the purpose of conducting an on-site evaluation. This site evaluation serves to recognize the many direct and indirect factors that may contribute to risk potential. This on-site visit provides a time for equipment recommendations and suggestions for implementation or changes to policies and procedures. It also identifies areas in need of improvement that impact safety of the work environment and use of equipment (storage, maintenance, clutter, etc.).

Team members or evaluator must understand the philosophy of ergonomics and ergonomic processes specific to patient-care environments; therefore, appropriate training, as offered in this tool, must be completed. Site visit team members may include persons with training in the ergonomic process, such as industrial hygienists, occupational medicine practitioners, and ergonomists. It is suggested that at least one nursing and therapy representative each receive training and become a site team member. During the site visit on each unit, the nurse manager or clinical area supervisor designee and/or SPHM unit peer leader (UPL) from that unit will join the team in order to answer questions specific to the unit. The SPHM facility coordinator (FC)/program manager is also present. Additional staff involvement is encouraged and important to accurately characterize a unit. Include as many front-line staff as possible. Having a sufficient number of staff available to talk with the site visit team will broaden the scope of understanding of

the unit. If the facility wants to include external evaluators, opinions of these professionals may be valuable.

The facility or organization may opt for an opening conference with the site visit team and key facility staff. A closing conference of the same group may also be used to bring attention to leadership of the overall SPHM Program needs.

Each clinical unit/area begins the site visit process with a lead-in conference and may end with a post-site visit discussion. These meetings include site visit team members and other designated staff from each unit. Participants in the opening meeting discuss and clarify information obtained from the pre-site visit data collection tools and gather additional information. With a more complete understanding of operational issues specific to the unit, the ergonomics team requests a guided tour of the unit. This may take 30 or more minutes. If used, the post-site visit discussion summarizes information captured previously for accuracy and is helpful in prioritizing issues.

During the site visit walk-through, note if necessary:

- Equipment
    - Availability
    - Use
    - Storage
    - Condition
    - Accessibility
    - Structural issues that impact use
- Patient room/size configurations
- Floor coverings
- Showering/bathing facilities and process
- Toileting process
- Ceiling characteristics/air conditioning vents/televisions/sprinklers
- Safety design issues: thresholds, doorways, room layout
- Proper use of technology
- Availability and location of power sources (outlets and batteries) for equipment
- Patient room/size configurations
- Storage location(s), available space

- Availability of clear and concise directions on how to clean equipment and how often to clean it

During the site visit walk-through, use the Patient Care Ergonomic Evaluation Staff Interview Tool (Enclosure 3-3) (Hodgson, Matz, & Nelson, 2013) and document the patient care ergonomic issues related to each specific type of task. Add others if they are missing and ignore those that do not occur on the unit. Capture the frequency that each task is performed and whether there is any existing or ordered equipment for the task under review. In the last column, include patient-handling sling and equipment recommendations. Be sure to capture typical medical/physical descriptions of the patient population found in the specific unit/area and include the degree of patient dependence/independence based on clinical unit/area's patient's abilities in moving, handling, mobilization, and ambulation. (Include percentage of patients that are classified as totally dependent, extensively dependent, and requiring limited assistance). As well, notate the number of beds on the unit and the average census, percentage of bariatric patients seen in a given time period, and the heaviest patient under care during that time. Also capture room configurations, such as private rooms or multi-bed rooms, and any storage issues in the area. It is also important to ask about the degree of use of existing equipment. If a certain type of existing equipment is not being used, there is no use in recommending more of the same. Reasons for lack of use must be understood so the evaluators can make suggestions for increasing usage.

3.2.4. Step 4: Generate Recommendations

Recommendations should be achievable and simple. When developing recommendations, it is necessary to account for constraints, such as fiscal resources, administrative support, and environmental factors.

To generate recommendations, there must be careful review of data obtained prior to an on-site visit and during the site visit. Pre-site visit data includes information that should be reviewed before the site visit and confirmed during the site visit. This includes presence, use, and condition of existing equipment; staffing trends; general patient population characteristics; characteristics of the physical environment; injury data; and staff perceptions of high-risk tasks. Site visits will provide observational data on the physical workplace and perceptual information from frontline staff regarding high-risk tasks and other ergonomic and safety issues. Recommendations identify high-risk situations or job tasks and control measures to decrease risk. Environmental hazards, such as cluttered patient care areas, confined space in bathrooms, or broken equipment are also identified. Recommendations for programmatic issues, program improvements, and lacking essential program components will also be made, such as the need for a Bariatric Program or a UPL Program.

3.2.4.a. Ergonomic Control Measures

The following describe two control measures common to the world of ergonomics.

1. **Engineering Controls.** Engineering controls are the best line of defense for the caregiver when performing patient handling tasks. These solutions involve a physical change to the way a task is conducted or physical modification to the workplace. SPHM technology is an engineering control. It is introduced to decrease ergonomic risk while moving, handling, and mobilizing patients, and in doing so, changes the way tasks are accomplished and also often physically modifies the workplace. Please refer to Chapter 4 for a variety of SPHM equipment used for this purpose.

   As noted above, ergonomic interventions in the form of SPHM technology are available to decrease the chances of injury to the patient or staff. However, some of the equipment requires special considerations for storage and accessibility. Additionally, when designing room and toileting area, the size of floor-based equipment and the need for two or more caregivers to use the equipment should be considered. There must also be adequate room to safely maneuver the equipment in the patient care areas.

2. **Administrative Solutions.** Administrative solutions usually involve the way the work is scheduled or staffed and do not involve a physical change to the workplace. Examples might include minimizing the amount of times a patient or resident must be transferred or the introduction of lift teams that always use SPHM technology as necessary when moving, handling, and mobilizing patients. Administrative solutions alone are not sufficient to protect caregivers from risk of injury. Because the hazard remains, technology must also be part of the solution if administrative controls are used.

Here is an example of how administrative controls can be used involving rescheduling to minimize a high concentration of lifting activities for direct patient care staff. It took place at a state department for the developmentally disabled involving facilities housing highly-dependent patients who were in need of much assistance to be moved. One of the most demanding times for patient transfers involved the part of the day when staff members were preparing patients to be picked up in buses and transported to their daily activities. Because of the way activities were scheduled and how the buses ran, staff members were rushing and highly stressed to prepare patients for transport in a short time period. Lifting equipment was considered and did improve the situation; however, the short window of time to get patients out of bed and prepared for transport was creating the problem. This was not an issue that staff caring for the patients could solve themselves. It involved many people throughout the entire facility, including those responsible for scheduling patient activity programs and meals, as well as the organization that had been contracted to provide transport services. Other than the direct patient care staff, the other groups were unaware of the problems encountered with the short time window provided to prepare patients for transport.

After an initial meeting was held with the other operational groups at the facility, they understood the problem and were more than willing to consider options to improve the situation. Scheduled activities were adjusted and methods of transport pickups were also changed. This resulted in distributing the number of required transfers over the workday and allowed for better use of lifting equipment. The implementation of this administrative control required some careful planning and presentation of the problem as well as cooperation from operational groups within the facility. The end results were positive to all involved, including the patients, who received better care. This was due to the fact that direct patient care staff had more time in preparation for the transport process and they could give more individual attention to patients.

Another example of an administrative control is a lifting team, in which facilities train and equip a specialized team in charge of all or a subset of patient lifting and/or repositioning tasks. The team must have training for the full range of tasks and easy access to all the SPHM technology they need to avoid handling patients manually. Some facilities have found benefits in cost, staff satisfaction, and time for patient care, as well as skin care benefits from scheduled repositioning. However, lift teams may not succeed in facilities with significant numbers of unscheduled lifts/falls or with a high volume of lifts that cannot be accommodated by a lifting team. It is also important to remember that lift team members have high exposure to the risks that remain even with use of SPHM technology, including the forces required to insert slings.

3.2.4.b. Selecting Appropriate Patient Handling Equipment

Based on the dependency levels of patients, mobility levels, high-risk tasks performed, and other issues in the clinical area/unit, specific patient handling techniques and equipment are recommended using the previously detailed Patient Care Ergonomic Assessment Process. The following considerations are important for making good patient care ergonomic evaluation recommendations.

1. An adequate quantity of appropriate equipment should be available for use. Equipment should have available storage in accessible areas. A Preventive Maintenance Program should be instituted to ensure that equipment is in good working order and that batteries are charged regularly and are readily available. An adequate amount of equipment accessories, such as slings, must be available in a convenient location.

2. Laboratory-based studies at the James A. Haley Veterans' Hospital in Tampa showed that ceiling-mounted lifts require 55 percent less effort than portable floor lifts. Other research also showed the biomechanical benefit of using ceiling lifts over floor-based lifts (Marras, et al., 2009; Rice, et al., 2009). Alamgir, et al. (2009) found that ceiling-mounted lifts required less time and were more comfortable for patients than floor-based lifts. In the clinical setting, use of floor lifts typically decreases the number of patient handling injuries by 30 percent over 12 months, while ceiling-mounted lifts reduced injuries on one 60-bed nursing home by 100

percent over 12 months (Tiesman, H.M., Nelson, A.L., Charney, W., Siddharthan, K., & Fragala, G., 2003). The costs for these two types of lifts are comparable, but more ceiling lifts may need to be purchased to provide full coverage for the unit.

3. Some experts believe appropriate ceiling or wall-mounted lift coverage for a unit is equal to the proportion of totally dependent and extensive assistance patients, plus the proportion of those who require assistance in mobilization/ambulation. This provides for minimum adequate coverage for those patients whose care is most demanding on nursing staff. However, it has been found that the greater the coverage, the more likely staff will consistently use ceiling lifts. In most situations, 100 percent coverage is the best decision, although it may not be fiscally feasible.

4. Make sure various ceiling or wall-mounted lift features are considered. Allowing staff to view and test different lifts and their functions will provide insight on which models would better fit the facility, while providing the best functionality for staff.

   (a) The track design makes a huge difference in the functionality and value of the overhead lifts. The slight additional capital investment in H-track or traverse track systems provides much greater flexibility for tasks than the single-track systems. For example, traverse systems easily allow use of limb support and ambulation slings, whereas straight track designs do not facilitate such use. Additionally, the lift motor can be used throughout the space covered by the traverse track, providing added benefit over the straight track that can only be used in the single line of the track over the bed. However, this design may pose logistical problems with existing light fixtures and privacy curtains.

   (b) In laboratory and field studies conducted at the James A. Haley Veterans' Hospital in Tampa, staff preferred the two-function (up/down) lifts. When offered the multi-functional systems with powered tracking, it was found that the nurses actually worked against the motor and pulled the motor/lift because the powered tracking was too slow. However, the absence of powered movement along the track requires that the caregiver manually move the patient around the room. This requires minimal effort, and the nurse has hands on involvement with the patient at all times, which both makes the patient feel more secure and is in compliance with Department of Veterans Affairs (VA) policy. On the other hand, many facilities have multi-function ceiling lifts that move the motor left, right, up, down, and return the motor to charging, and staff view these functions as very beneficial and they still provide the necessary hands-on patient contact.

   (c) Many systems have a "return to charge" button that allows the motor to return to its proper charging base independently, and continuous

charge tracks have gained much popularity over time. With continuous charge tracks there is no need to make sure the motor is exactly lined up in its charging station. Lining lifts up with charging stations takes time, but more importantly, if the motor does not line up exactly with the charging station, the battery will lose its charge and then not be available for the next use, impacting staff and patient safety.

5. Accessories are available for lifting systems. It is worthwhile to add scales to the lift systems where patients are weighed frequently or daily. The availability of this technology replaces a task that can otherwise be stressful to the nursing staff, can place the patient at risk for falls, and allows the caregiver to spend more time addressing other patient needs.

6. Aging or inadequate quantities of battery packs can affect the availability of powered lifting systems. Where existing equipment on the units is not fully utilized due to battery problems, purchasing of additional or replacement battery packs might be a wise investment. An actual schedule or procedure may be necessary to ensure a reliable system for switching and recharging batteries. Depending on the types of batteries and charging technologies used by the lifting systems, additional battery packs might be warranted. For example, if the type of battery requires total discharge before recharging to extend battery life, then the system would be out of commission until the battery again reaches full charge. An additional battery pack would be warranted in this case and would add to the overall purchase price of the system. In one case there was an increase in staff injuries on night shift. Investigation revealed that the batteries for the patient lifts needed to be recharged overnight and were not available to staff on this shift. A back-up battery was purchased to allow the lift to be in use 24 hours per day and resulted in reduction in injuries.

7. Lift slings are available for a variety of patient handling tasks and for special applications, e.g., bathing, toileting, lifting appendages, repositioning, and more. Careful consideration needs to be given to the number, sizes, and types of slings selected for each lift. Laundering procedures may necessitate the purchase of extra slings if laundering is accomplished off-site and delays access to a set number of slings per day. Infection control policies mandate separate slings for each patient. Unavailability and/or insufficient number of slings have been identified as reasons caregivers do not use existing lifting equipment.

8. The quantity of various devices should be determined as a function of both patient needs and concurrent responsibilities of nursing teams. If, for example, during the morning shift, several teams require the availability and continuous use of a particular product, then sufficient quantities must be acquisitioned to satisfy this need. When not in use, SPHM technology

should ideally be stored central to all operations, such as in a storage room or location mid-way along the length of the unit.

9. The concern of patient falls from beds has risen. In addressing this problem, some units have adopted low beds and/or fall injury prevention matting that is placed on the floor. Both solutions are commendable, but in addressing patient injury concerns, risk of injury to nursing staff has been grossly ignored. Where low beds are used, those beds must have the capability to be raised to an acceptable working height. Nursing staff must be encouraged to utilize this function rather than addressing patient needs at a low level. Where mats are used, nurses might either first move the sometimes heavy mats before addressing patient needs, or walk across the mats, which presents a risk for instability. Furthermore, these mats must be frequently moved by housekeeping staff for cleaning purposes. Light, more stable mats are now becoming available, but this is an interim solution until the larger issue of patient fall risk can be adequately addressed without restraint.

10. Patient handling equipment with attachment or other potential ligature points, such as ceiling or wall-mounted lifts, must not be installed in mental health units where patients are suicidal or psychiatrically unstable. In lieu of prohibited equipment, portable floor-based or air-assisted lifting devices may be used. Such patient handling equipment must be returned to locked storage immediately after use so that patients cannot access the equipment.

3.2.4.c. Tips on Allocating Resources for Equipment

There are many issues to be considered by decision makers and the evaluator(s) in determining the best and most appropriate use of available funds, so prioritizing time and resources are frequently necessary. Using the baseline data on the incidence and severity of injuries and staff and management perceptions of risk, the evaluator(s) can identify higher-risk clinical units/areas in your facility. Higher-risk units will have the highest incidence of patient handling injuries, the most workdays lost, and the highest concentration of staff on modified duty. Although all locations where patient handling occurs are high risk, if there must be prioritization due to fiscal constraints, these higher-risk units/areas may be considered for the initial focus of ergonomic interventions. For example, the initial funding may be used for a higher risk unit, such as a medical intensive care unit. They may receive ceiling lift coverage in every patient room. Another option to fiscal constraints is to spread lesser amounts of equipment throughout several of the higher-risk clinical units/areas. It has been found, though, that when there is only partial ceiling lift coverage in a clinical unit, compliance in use is not as great as when there is full coverage, thus the value of the purchase decreases.

Your organization should also consider whether to purchase or lease patient handling technology, especially bariatric technology. If a product is needed for frequent use, then the best return on capital investment would be to purchase the

products outright. For equipment that is used occasionally or on an as-needed basis, such as bariatric care products, leasing may suffice. As a general rule of thumb, if the anticipated costs of the periodic leasing of a product over a 4-year span exceed the purchase price of the product, then purchasing might be the most cost-effective long-term solution.

3.2.4.d. How to Report Recommendations from a Patient Care Ergonomic Assessment

Importantly, reports include not just technology and sling recommendations; they include support structures that may be lacking, such as Maintenance Programs, standard operating procedures for laundering slings, Peer Leader Programs, and others. Recommendations also include the previous considerations. One report option is to use the Patient Care Ergonomic Evaluation Staff Interview Tool (Enclosure 3-3) as a template for the report. A sample of such a report is found as the Patient Care Ergonomic Evaluation Report (Enclosure 3-6).

3.3. References

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3.4. Enclosures

3-1 Patient Care Incident/Injury Data Collection Tool

3-2 Tool for Prioritizing High-Risk Patient Handling Tasks

3-3 Patient Care Ergonomic Evaluation Staff Interview Tool

3-4 Pre-Site Visit Clinical Unit/Area Profile

3-5 Existing Equipment/Condition/Use

3-6 Patient Care Ergonomic Evaluation Report


EOSH

Safe Patient Handling and Mobility Technology: Categories and Evaluation/Selection

4.1. Patient Handling and Mobility Technology and Devices

Within safe patient handling and mobility (SPHM), there are numerous categories of equipment that can be utilized separately or in conjunction with one another to allow safe mobility and care for patients. It is important to understand that the choice of equipment should be individualized for the patients' strengths and weaknesses and functional ability and should be used according to the manufacturers' instructions. Below is a brief description of each category and their benefits in providing safe patient care.

4.1.1. Powered Full-Body Lifts

Figure 4-1: Powered Full-Body Lifts
Photos Courtesy of Guldmann Inc.™ and ©2012 Hill-Rom Services Inc.

The most common lifting device used within government health care is a full-body lift. A number of models and configurations are available and are either portable on wheels or ceiling or wall mounted. Full-body lifts are usually used for highly dependent patients. They can be used to move patients out of beds, into and out of chairs, for toileting and bathing tasks, repositioning, lifting appendages, lifting a patient off of the floor after a fall, and vehicle transfers. They can also be utilized for therapy services for limb strengthening and ambulation. These lifts are available with many features, and there are a wide variety of sling types (toileting, ambulating, amputee, repositioning, turning, limb, etc.) that can be used for patients of different sizes, medical conditions, and physical limitations.

With a ceiling or wall-mounted lifting device there is continuous and easy accessibility. There is also no need to maneuver over floors and around furniture. These units are accessible and easy to use; however, transfers are limited to where overhead tracks have been installed and the hanger bars can reach.

There are several types of tracking systems, such as traverse (H-track), portable, gantry, and straight track. These tracking systems can be set separately or connected between patient rooms, bathrooms, or the hallway. Lifts can be beneficial extending over toilets, showers, and/or bathtubs. They can also be used for entry into and/or assistance during water therapy. Proper ceiling lift usage provides a safe spinal force from compression, lateral shearing, and anterior/posterior shearing (Marras, Knapik, & Ferguson, 2009).

Where overhead tracks are not available or practical, floor-based total body lifts can be used to suspend the client. These lifts are less accessible to the direct care area, requiring the staff member to leave and get the lift. Most floor-based lifts require manual maneuvering of the lift, while the patient is being held, which creates a potential for injury (Marras, Knapik, & Ferguson, 2009). Floor-based lifts can be more difficult to push if they have small wheels or must roll over obstacles, carpet, or rough surfaces.

4.1.2. Powered Standing Assist Device (Sit-to-Stand Lift)

Figure 4-2: Powered Standing Assist Devices
Photos Courtesy of Guldmann™ and EZ Way, Inc.

Powered standing-assist devices are useful in moving partially-dependent patients who can cooperate, with some weight-bearing ability, in and out of seated positions. It is important to evaluate patients' ability to meet the requirements of the specific device. These lifts are more easily maneuvered in small spaces, such as bathrooms, to assist in toileting and can often be used with vehicles. There are some variations in the sling design and attachment, but they usually support the torso while leaving the pants accessible. These lifts can also be used during physical therapy to strengthen the upper and lower extremities, and some designs can assist with ambulation. Specialty slings may be required for this purpose to ensure safety during the ambulation process. Accessories may also be available for securing paralyzed extremities or providing extra support for hips or handles for walking.

4.1.3. Non-Powered Standing Aids

Figure 4-3: Non-Powered Standing Aids
Photos Courtesy of Handicare

Patients requiring little assistance transferring to a standing position may utilize non-powered standing assist and repositioning devices for leverage. Patients must be able to grab onto the bars to bring themselves upright and sit down or pivot onto another seating surface. This is another piece of equipment that is great for upper and lower extremity strengthening. Some may have free-moving wheels and a fold-down seat allowing for patient to sit during transport. Non-powered stand aids can be used for fall protection during transfer or toileting, and some have removable footplates to allow ambulation.

4.1.4. Slings

Most full-body and sit-to-stand lifts, as well as some stand aids, use slings for patient lifting, support, or positioning. The choice of sling type and size, method of use, and compatibility with the equipment may have major safety implications. Manufacturers will have directions and sizing guides. Additional lift sling information can be found at: http://www.tampavaref.org/safe-patient-handling.htm. This Web page includes: sling bibliography, sling guideline chart, sling medical conditions, sling quiz, slings toolkit overview, and sling technology resource guide.

4.1.4.a. Sling Compatibility

The sling must be intended for the type of lift in use. Described below are typical types of slings meant for full-body lifts, sit-to-stand lifts, and stand aids. There are also specialty slings developed for less common lifts.

The sling sold by the manufacturer for use on a particular equipment model should be acceptable, provided that there are not safety problems with it and that it works acceptably for the task. Sometimes facilities have used slings from different manufacturers, either because the needed sling is not available from the lift manufacturer or because the sling from a different manufacturer is better for patient care. Before interchanging manufacturers' slings and lifts, the risk should be assessed, including these factors:

- The attachment type must be compatible between the lift and the sling; clip-based slings, loop-based slings, and chain-based slings with metal parts are not interchangeable with each other. For clips, which have tight compatibility, the fit should be considered carefully. For loop-based slings, the type of hanger bar that was used in testing may matter, and some manufacturers have specifications on types of slings that can safely be used. For loop-based slings with many loops, such as a repositioning sling, it is important that all the loops fit onto the hanger bar safely.

- The capacity of each piece of the system needs to be adequate for the task and the size of the patient.

- The sling needs to be acceptable for the task, functioning correctly and avoiding staff or patient injury.

- The position of the patient in the sling when attached to the lift needs to be safe for the patient and effective for the task. For example, a sling with different loop design may not lift as high; may not set the patient in a full, upright position; or may hold the patient at a different angle depending on the type of hanger bar used.

- Caregivers need to be trained on slings and on any special methods to use them with the equipment.

- It may be necessary to consult key stakeholders, such as risk management, legal counsel, logistics/commodities, patient safety, wound care, manufacturers, etc.

4.1.4.b. Sling Inspection, Care, and Fabric

Slings need to be inspected before use for visible structural problems, including cuts or tears, fraying, loose stitches, fabric damage from abrasion or heat, and label readability. If the sling is not structurally sound or the label is unreadable, it needs to be taken out of service. Some manufacturers have specific recommendations, which may include more detailed periodic inspections. Washing or reprocessing instructions vary between slings and fabric types, although many slings are damaged by high heat or bleach.

Slings may be reusable or disposable, and reusable slings may be washable or wipeable. The facility typically chooses sling types based on use requirements, infection control, and methods and costs of laundering and reprocessing. A system needs to be in place to supply slings reliably where and when they are needed, which means that reserve slings and a replacement plan are needed to compensate for laundry delays and loss or degradation. In most cases, slings are not used for multiple patients without cleaning in between for reasons of infection control. Disposable slings are typically also referred to as single patient use and used for one patient until the sling is soiled or the patient is discharged.

Fabric types vary widely and may have different effects. Polyester slings are common and may respond well to washing. Some fabrics are designed for durability in washing, while others may be designed for comfort. Net or mesh slings may allow more air through and prevent or mitigate heat buildup, but some mesh slings may leave imprints on bare skin with prolonged use. Wicking fabrics have been offered in both reusable and disposable categories and may help with moisture management. Sling manufacturers continue to introduce new fabrics to better meet patient care needs. Wipeable slings usually have a coating that keeps them from being breathable, which usually means that they are not good choices to stay under a patient. Disposable sling fabrics vary from nonwoven fabrics to many textures of cotton, polyester, and/or polypropylene, among others, each of which may have their own effect on breathability and environmental footprint.

4.1.4.c. Slings by Lift Type

This section will describe only slings and attachments for the most common lift types. There are also specialized lifts and slings for specific types of lifts that may only fit the exact model they were made for.

- Slings for Full-Body Lifts (floor or ceiling mounted):
    - Seated slings can be designed in many ways to support different types of patients. Design features may include:
        - Supportive straps that prevent a patient from falling out.
        - Wide openings for hygiene, relying on patient muscle tone and straps around the torso to keep the patient elevated.
        - Designs that are easy to insert.
        - Designs that can be left under patients in chairs, depending on skin condition.
        - Support for patients with limb amputations.
        - Special fabric options tested to avoid pressure, temperature, and moisture problems.
        - Clip attachments or loop attachments.
        - Varied location and number of loops or clips depending on sling design and purpose; for example, a sling intended for use in a vehicle may have its loops or clips closer to the patient's body.
    - Repositioning slings are meant to stay under patients who cannot move themselves in bed, making it easy to turn, reposition up in bed, change sheets, or transfer to another flat surface. Repositioning slings may improve the efficiency of turning schedules because the

sling is always ready to be used without requiring repeated insertion. Designs vary in width, length, number and length of attachments (usually loops), and fabric. A few, but not all, designs can be used in the seated position; this varies by manufacturer.

- Turning slings vary widely in design. Some manufacturers use a pair of straps to turn patients, attached on one side and lifted on the other side. Triangle or hourglass designs are meant to attach to the bed on one side while lifting with the other side, leaving more of the patient's back visible than with a full-size repositioning sling. There have also been specialized systems developed with sections that slide under patients, and one method of turning a patient prone involves the use of two ceiling lifts in the same room, one attached to each side of an hourglass-shaped or square turning sling.
- Limb slings are meant to lift a limb easily, for wound care or range of motion. Sizes vary, and some companies also use these or similar slings as turning straps.
- Walking or ambulation slings are built to support a patient while walking. Design varies widely. Some support patients by the ribs and/or thighs, some are primarily around the hips, some support through the groin, and some are shaped like shorts. There are versions built to support a pannus for patients of size as well.
- Combination slings have been developed for multiple purposes in one item, for example full-body lifting and air-assisted lateral transfer. This may be useful for a dependent patient who needs to be lifted, repositioned, and transferred laterally.
- Pannus slings have been built to support a pannus on a patient of size using a lift. Multiple fabrics and designs may be available.
- Supine or stretcher slings are built for use with specific multi-point hanger bars to keep patients entirely flat. Designs for hanger bars and slings vary by manufacturer and may include eight to ten attachment points, either with a single sling underneath or with a series of straps inserted. This need may occur in areas where patients need stabilization, and this style of sling may also be used in places like morgues.
- A body support is sold by at least one company, which supports the ribs and thighs in a seated position without a sling. Scoop-style stretcher attachments are sold for stabilization with some floor lifts.
- A metal scoop attachment is sold for morgue use with some overhead lifts.

- Slings for Powered Standing-Assist Device Lifts:
    - Standing slings most often connect at only two points (via loops, clips, or ropes) and support the patient behind the back. New versions typically have a torso support strap to keep the patient from slipping down out of the sling.
    - Individual manufacturers have special support straps designed to secure uncontrolled limbs.
    - Specialized ambulation slings can be used with the powered standing assist device that is designed for ambulation. Some of these may offer more support through the hips.
    - Some manufacturers offer hip slings that can be used in conjunction with standing slings to offer more support.
- Slings for Non-Powered Stand Aids:
    - A simple version of the standing sling is occasionally used on non-powered stand aids to stabilize a patient's torso. This is not particularly common because the patients must be able to pull themselves to standing position in order to use a non-powered stand aid; it is unsafe to pull them to standing position manually.

4.1.5. Air-Assisted Lateral Transfer and Positioning Devices

Figure 4-4: Air-Assisted Lateral Transfer and Positioning Devices
Photos Courtesy of HoverTech International

Disposable and reusable air-assisted lateral sliding aids provide a flexible mattress that can be placed under a patient in the same manner as bed linen. A portable air supply attaches to the mattress to allow inflation. Once the mattress is inflated, air flows through the mattress and exits through perforations on the bottom of the mattress. The patient is then able to move on a cushion of air, substantially reducing the friction on the patient's skin and decreasing the amount of manual effort required by staff to laterally slide a patient from one area to another. The mat may be kept under the patient for transfers from stretchers and tables and in some cases while in bed, depending on facility policy, infrastructure, and mat design. Weight limits vary by manufacturer and are beneficial during lateral transfers or pronation with patients with special body limitations, medical

conditions, pressure sores, or in high-risk areas, such as surgery. Mattress widths vary to accommodate patients of various sizes. They come in various dimensions, including full-body length, split-leg, and half-size to assist in different surgical/medical procedures. Specialized, heat-sealed mattresses can be used in surgery to prevent cross contamination. The deflated mattresses can also be maintained under the patient during X-rays, computerized tomography (CT) scans, and magnetic resonance imaging (MRI) procedures. Extension hoses are available to facilitate use in MRI areas in order to leave the pump outside. These devices can also be used in conjunction with a flat-lying air-assisted lifting device to transfer a fallen patient onto a stretcher.

4.1.6. Air-Assisted Lifting Devices

Figure 4-5: Air-Assisted Lifting Devices
Photos Courtesy of HoverTech International and Prism Medical Inc.

Air-assisted lifting aids utilize a powered air supply to inflate multiple mattress layers to raise the client off of the floor after a fall. Some of these can support a large amount of weight (up to 1200 pounds). One type raises the client to a raised, sitting position, allowing the patient to stand up and transfer to a nearby chair. These can come with or without a back support. Another type maintains the client in a flat lying position and can elevate multiple mattress layers, to the height of a stretcher, allowing for a lateral transfer to another flat surface. The overall height can be determined by the caregiver, as each layer is filled with air independently, allowing the client to sit and stand up as if they were on a bed. The firm surface allows a surface hard enough for cardiopulmonary resuscitation (CPR) and suspected/spinal injury patients to be supported, in conjunction with backboard and c-collar. External battery packs allow for the device to be used in areas where electrical access is not available, and rugged bottoms allow for the devices to be used outside and on rough surfaces. Refer to manufacturers' instructions for patient movement or evacuation.

Powered air supplies can also be used with smaller cushions to position airways, raise limbs, or turn patients. The pictured device can be utilized to elevate the head, neck, and shoulders at different levels to provide easy access for intubation.

4.1.7. Friction-Reducing Devices (FRDs) and Repositioning Aids

Figure 4-6: Friction-Reducing Aids
Photos Courtesy of Medco Technology, LLC, and Jamar Health Products, Inc.

Friction-reducing sliding and repositioning aids are designed to lower friction to make movement easier on a flat surface. This category of friction-reducing device is sometimes abbreviated as FRD. One way they can be used is to assist in lateral transfers. FRDs can also be used to assist in moving patients up, down, and sideways in bed, as well as turning patients from side to side and pronation. As shown in Figure 4-7, handles surrounding the perimeter, in conjunction with pull straps, can limit forward bending and reaching across the bed. They can also be used to assist in sling or X-ray cassette placement, active and passive range of motion, strengthening exercises, and repositioning in a chair. FRDs can be used to ease insertion of slings on patients of size. One-way slides aid in chair repositioning and glide easily in one direction but hold fast in the other direction to prevent sliding out of chairs. Stocking applicators can be used to apply and remove compression hose. These products provide a surface for the patient to be slid over more easily due to the friction-reducing properties of the device material. Many different designs are available, including flat sheets or loops of different sizes and disposable or reusable materials. They are usually made of a pliable material that is easy to store, although thin slide boards are also made to aid in positioning. Most slide sheets cannot stay under an unattended patient because of the risk of uncontrolled sliding. There are companies making bed linen systems that ease movement in some directions while discouraging uncontrolled movement in other directions.

Not all FRDs are equally effective for every purpose. Some reduce friction more than others, and some must be inserted by rolling a patient. It is important to consider the possibility of overexertion even with slide sheets. Patient skin damage can occur either from application or from letting some parts of the body slide without friction reduction. Trials with staff in the areas of use will help to identify differences in function.

Repositioning aids are made for particular purposes. Roll boards with foam or solid cores allow an outer surface to slide around a slippery middle core, bridging the gap between flat surfaces and allowing easier lateral transfer on flat surfaces. Swivel cushions and seated repositioning aids can ease transfer and repositioning in vehicle seats. Slide boards are made in many sizes for many types of transfer

or friction reduction, although full-length slide boards are no longer the easiest and safest method for lateral transfer. Seated slide boards facilitate transfer for patients who wish to maintain independence as described later in this chapter.

4.1.8. Turning Systems

Figure 4-7: Turning Systems
Photos Courtesy of ErgoNurse, Inc. and Vancare, Inc.

Turning systems assist the caregiver in turning, repositioning, pronating, and/or suspending the patient. They can be either manual or electric. One device uses clips to attach the sheet to an existing lift system, allowing it to turn but not lift patients. Another device frames the bed and attaches to existing bed sheets, using bed lowering to accomplish turns or lifts. This device cannot fulfill all of the functions of a full-body lift and occupies a significant storage footprint. It is important to trial such equipment and review data relating ease of use and forces on the caregiver's musculoskeletal system. Also consider patient skin-shearing risk.

4.1.9. Bathing, Showering, and Hygiene Assistive Devices

There are several devices that make hygiene safer for staff and provide comfort to the patient. Mechanical lifts and other safe methods can be utilized to assist patients in and out of these specialized bathing systems, as appropriate for each patient.

There are whirlpool tubs that provide the comfort of jets providing water therapy and easy access into the tub through a side panel door. Some tubs can raise and tilt back, allowing the patient to relax and provide easy access for the caregiver to provide cleaning.

Ergonomic shower chairs are also available. Some raise the lower extremities to the height of the caregiver and/or recline back, while others provide built-in water hoses to allow for easy access to water. Many also have integrated toileting accessories.

4.1.10. Bed Improvements to Facilitate Mobility

Figure 4-8: Bed Designed for Weight Bearing, Standing, and Early Mobility
Photo Courtesy of Universal Hospital Services

Hospital beds have come a long way since the manual crank beds were used (although they are still present in some geropsychiatry units). Improvements have been made that allow for better patient care and mobilization and for employee safety. Some beds convert into a chair, while some extend farther than that and allow the patient to go from a sitting to a standing position. Many beds will create a pocket in the seat when the head of the bed is raised to prevent the patient from sliding and/or shearing skin surfaces. Further innovations with bed mattresses, surfaces, and frames can aid side-to-side rotation and turn a patient on a schedule or as needed. One company has developed a bed that pulls the patient up with the touch of a button using a long sheet that rolls up. Figure 4-8 shows a hospital bed that can go from a lying to a standing position, which facilitates patient mobilization and allows the patient to strengthen their lower extremities to prepare for ambulation.

4.1.11. Motorized Exam Tables

Figure 4-9: Motorized Exam Tables
Photos Courtesy of VA Butler Healthcare and The Brewer Company LLC

Electric exam tables and dental chairs are available to assist in the clinic setting. Electric tables allow the patient to be leaned back, his/her legs raised, and/or the table itself to be raised to working height and lowered to self-transfer height with the push of a button. Expanded capacity electric exam tables are also available. One type of device leans a patient back while sitting in their personal wheelchair to provide access for dental care or other care that requires reclining without the need to transfer. For older clinics where high exam tables must be used, a specialized platform lift can be used to raise standing patients up to table height.

4.1.12. Seated Slide Boards

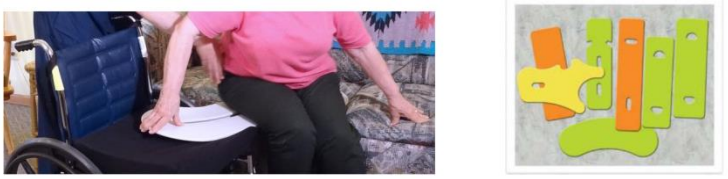

Figure 4-10: Seated Slide Boards
Photos Courtesy of Beasy™ Trans Systems, Inc.

Seated slide boards can be used as a bridge for a smooth transition from one surface to another, allowing independent transfer for many patients with upper body strength and balance. These are especially helpful for bed to chair, chair to chair, and chair to toilet transferring. Designs are varied and can include extra length or special shapes to facilitate transfer to vehicles or toilets. Some allow a fluid transition while others provide a pivoting and sliding area to reduce friction on the skin. Some patients are able to transfer themselves once properly trained. If a patient is not already trained on transfer with a slide board, there is an increased risk of patient falls from the board during transfer. Slings that allow full

use of arms, including ambulation slings, may serve as fall protection during training.

4.1.13. Mechanical Lateral Transfer Aids

Figure 4-11: Mechanical Lateral Transfer Aid
Photo Courtesy of Human Care USA

These are devices that allow a smooth transition to height-adjustable stretchers. Some are manual, requiring the use of a crank shaft, where others may be motorized. Motorized functions allow a smooth, lateral transfer of the patient without caregiver force; however, skin shearing may be problematic for patients.

4.1.14. Motorized Patient Transport

Figure 4-12: Types of Motorized Patient Transport
Photos Courtesy of Electro Kinetic Technologies, LLC, Dane Technologies, Transmotion Medical, and Tollos® Inc.

Motorized stretchers and convertible stretcher chairs are available to allow for single caregiver use. Different widths, weight capacities, and surface materials are available, allowing for use with bariatric patients and the treatment and/or prevention of pressure ulcers. These decrease the need for two or more caregivers to transport the patient and decrease the risk of employee and patient injury.

Beds with motorized drive can make beds easier to transport by reducing turning and pushing forces. Battery-powered bed movers are an option for facilities without integrated motor-assist driven beds. Users should ensure adaptability of the bed mover to the bed frame. Special consideration should be taken regarding

the space and maneuvering requirements in elevators, hallways, patient rooms, and tight spaces.

Attendant-operated electric wheelchairs are employee operated and can be used when transporting bariatric patients or on inclines and ramps. Some motorized wheelchairs are gurneys that turn into wheelchairs, while others maintain a chair position only. Battery-powered wheelchair movers are also available to connect to existing wheelchairs, although the variety of wheelchair types may require different attachment methods.

4.1.15. Non-Motorized Transfer Chairs

Some wheelchairs and dependency chairs can convert into stretchers where the back of the chair pulls down and the leg supports come up to form a flat stretcher. These devices facilitate lateral transfer of the patient or resident and eliminate the need to perform lift transfer in and out of wheelchairs. There are wheelchair devices that convert to stretchers that also have a mechanical transfer aid built in for a bed to stretcher- or stretcher to bed-type transfer.

4.1.16. Additional Therapy Devices

There are multiple therapy devices that can be used to assist in strengthening, ambulating, balancing, transferring, range of motion, stretching, training in fall recovery, etc. Some ceiling lifts provide integrated measuring of both patient weight and distribution of patient assistance. This can assist in ambulating, interactive balance training, sit-to-stand maneuvers, and traversing stairs.

In addition to motorized ceiling and floor-based lifts, other SPHM devices, such as tables, assistive devices, ambulation devices, beds, etc., can be used in therapy services to increase mobility and strengthening of patients. Convertible treatment tables can be used to assist patients in weight bearing by providing additional assistance for patient needs while removing the risk of falling and providing digital displays measuring the patient's weight, angle of back, etc. Some are larger for use in an area such as a therapy gym, while others are smaller and can be used at the bedside. Walkers can also be used to assist in ambulation exercises; some have slings or pads to help hold the patient in place and prevent the risk of falling and/or the ability to hold oxygen, IV poles, lines, and tubes, as well as chest tube canisters to facilitate early mobility. Some walkers are motorized to assist with lifting and adjustment. Additionally, some beds offer weight bearing ability at the foot portion of the bed.

By utilizing SPHM technology in therapy, multiple benefits can be obtained, such as increased safety and confidence from the therapist, patient, and caregiver. This allows the ability to challenge the patient safely and work with more complex patients, including bariatric, in a safe environment, while allowing the therapist to provide highly-productive sessions with better eye contact and manual cues to enhance patient mobility.

4.2. Equipment Evaluation/Selection

It is critical that the equipment purchased by a facility is user friendly, specific for the patient population under care, easily maintained, and has other necessary attributes. The results of the evaluation will drive what is selected/purchased. If the evaluation provides critical decision-making information, the equipment selected should facilitate user acceptance and compliance in use. Determining what is the most appropriate equipment vendor and equipment must be more than a decision made by a person in a contracting office and should not be only based on cost. However, once a decision has been reached, local contracting staff must be consulted to assist with negotiating the purchasing procedures. Staff must be involved in evaluating and selecting equipment. The following considerations and evaluation methods are necessary to make good equipment purchase decisions.

4.2.1. Equipment Evaluation Process and Considerations

Equipment evaluations are typically used to compare the usability of competitive equipment types for a specific application. As such, development of an equipment evaluation protocol is highly dependent on equipment type and application.

4.2.1.a. Preliminary Equipment Evaluation Process

The process should typically be initiated by identifying all products that could be used to perform the desired application in a reasonable and safe manner. It will be useful to develop criteria for the desired product type. A Request for Information (RFI) based on these criteria may be published in Commerce Business Daily. Local contracting staff can assist with this process. Literature for each of these product types should then be requested from each identified product manufacturer.

Following an initial review of the product literature to eliminate those products that would not be suitable for the intended application, the evaluation team should approach each manufacturer requesting information on any previously performed or ongoing field and laboratory-based equipment evaluations. Be aware that if the product manufacturer, not an outside research facility, has performed the equipment evaluation, then the findings of such evaluations might be biased or incomplete. A literature search, both peer review and newspaper/industry magazine, should be conducted to determine if other information is available for each product.

Contracting staff should be involved early in the process and may assist with performance or cost of operation measures pertaining to both the equipment and vendor. Performance measures considered by contracting staff include:

- Special features of the product not offered by comparable products.
- Trade-in considerations.
- Probable life of the product compared to comparable products.

- Warranty considerations.
- Maintenance requirements and availability.
- Past-performance.
- Environmental and energy-efficient considerations.

Contracting staff may also contact the Food and Drug Administration (FDA) and National Reporting Office for any information pertaining to equipment-related incidents and recall information.

Discussion with vendor customers/equipment owners can present very useful information for the evaluation process. If possible, meet with facilities using the equipment you are considering for purchase. The purpose of such meetings would be to view operation of the equipment, discuss with facility staff and patients, and try to attain cost of operation information (incidence/maintenance and adverse events). A facility might even be willing to provide access to patients and staff for a field study of mutual benefit.

When evaluating equipment, it is important to look at multiple factors, such as the environments for equipment use, general patient activity level, type of unit/area, cost, versatility, efficiency, maintenance, maneuverability, and storage availability in the area where the equipment will be used. The equipment also needs to be cleaned easily, provide safety for patient and caregiver, provide comfort to patient, and be easy to operate. The following details will determine what equipment will be functional with your environment and patient population.

1. Environments for Equipment Use

   There are multiple areas where SPHM equipment can be introduced to provide safe patient care. Among these areas are long-term care, rehabilitation, surgery, pre/post-surgical, radiology, therapy, urgent care, emergency room, intensive care unit, home care, post-anesthesia recovery units, transportation within or between facilities, emergency medical service (EMS), ambulance bay, and outpatient clinics. Even operating rooms have patient handling hazards that can be addressed with SPHM technology. SPHM technology may also be needed in general care areas, such as hallways, bathrooms, spa rooms, pool areas, common areas, etc. The general rule of thumb is that anywhere patient care takes place, some form of SPHM technology can be incorporated to provide safe, holistic care, while protecting both the client and the caregiver from injury. Representatives from all of these areas must be involved in the equipment evaluation and ensure their patients and area/unit needs are represented.

2. General Patient Activity Level/Type of Unit/Area of Patient Care

Each area of patient care needs to be looked at differently to examine patient flow, space, client needs/population, utility availability, etc. For example, patient needs in surgery will vary considerably from their needs on a rehabilitation unit and vary still in comparison to an intensive care unit. Although many pieces of equipment can work interchangeably with patient populations, some pieces are more useful in certain areas than others. For example, inflatable mattresses work very well in surgical areas where there are barriers to overhead ceiling lift installation because of infection concerns and equipment secured to the ceiling; however, more facilities are developing functional designs that incorporate ceiling lifts. Rehabilitation units will need floor-based equipment, such as sit-to-stand lifts, to help with rehabilitation in their rooms; however, ceiling lift tracks installed down the hallway on rehabilitation units can also help with ambulation practice.

3. Cost

   Cost is always an important consideration, although it should not be the only consideration. Just because something meets cost needs does not mean it will meet functionality and environmental needs. If employees do not like the product or feel it is unsafe, too cumbersome, or inefficient, they are less likely to use the product, thus money invested will be lost. It is best when evaluating SPHM technology that you purchase something that both meets your needs and is cost effective, not one or the other. Technical evaluators may not see price offers and must specify technical factors in advance, so specified technical factors in purchasing actions need to address all needs identified during trials or market research.

4. Efficiency and Reliability

   Efficiency is another important aspect when selecting equipment. It is important to have an efficient piece of equipment and one that can be easily obtained and operated. With patient care staff demands, quick and easy is what employees need. It is important to have a product that your caregivers feel comfortable using.

   Good battery life, warranty, and predictable maintenance requirements can help to ensure availability to your employees. Battery life may depend on the care and charging of the equipment. There are several types of options for powered lifting equipment. Many pieces are battery operated. Some lifting equipment must be plugged into an outlet to ensure the battery is charged when the lift is needed and some must be unplugged to use. Some have dual batteries that can be interchanged for charging purposes; while one battery is in use, the other can be charging. Some items must be plugged in during use, while others have a battery pack option that charges when not in use. Such a battery pack can be taken anywhere with the lifting device even where no electrical outlets are

available. Ceiling lifts may have a docking station to charge, continuous charge capability (charging anywhere on the tracking system), or have to be manually plugged into an outlet to charge. Ease of charging affects availability and resulting compliance.

Reliability may vary between manufacturers or models. Past performance information may be available from other users. FDA reports may also be available to point out past safety problems. Purchasing equipment that is quick and easy to use, safe, and readily available will ensure greater efficiency for patient care staff.

5. Maintenance Requirements

Some products require periodic maintenance, such as changing belts, fluids, batteries, and checking weight lifting capacity, etc. For example, the Veterans Health Administration (VHA) suggests that all ceiling-mounted lifts have regularly-scheduled preventive maintenance to ensure that they remain safe. VHA National Center for Patient Safety (NCPS) Patient Safety Alert 14-07 provides checklists that must be completed after performing most types of maintenance on lifts. Planned and unplanned maintenance can put the equipment out of working order while the maintenance is taking place and will require extra cost and potentially additional products/services to complete. If periodic maintenance is not completed, this can create a safety risk for the patients and caregivers, potentially resulting in injury. The manufacturer may not take responsibility for equipment failure if maintenance is not completed appropriately. Some manufacturers will provide routine maintenance for your organization. After reading manufacturers' instructions and meeting with the necessary disciplines, determine if the maintenance is too much for engineering, biomedical, housekeeping, and/or patient care staff to handle. It is important to plan for maintenance, whether it will be completed internally or contracted out. Maintenance costs may also be calculated as part of anticipated lifecycle cost and used to compare equipment.

Slings themselves require cleaning and inspection between patients to ensure their safety. It is important to maintain par levels during this routine maintenance. Some facilities clean slings on the unit, some send slings to housekeeping to be laundered, while others use external resources for their cleaning. While slings are being cleaned, others will need to be available for use. Slings will also be lost and need to be replaced, either from wear and tear or from loss during the laundering or distribution process.

6. Maneuverability

Ceiling lifts provide the most maneuverability and the least amount of strain on the caregiver's body during transportation (Marras, Knapik, & Ferguson, 2009). Maneuverability is especially important in small spaces, such as exam rooms, bathrooms, and small patient rooms. Ceiling lifts are especially valuable in small rooms. Ceiling lift tracking systems can extend into bathrooms, over toilets and bathtubs, or cover entire rooms, allowing for much easier maneuverability than floor-based lifts. Lifting height is important; the lift must be able to lift the patient up from the floor to the highest surface necessary. For areas with low ceilings, specifying technical factors may help to ensure maximum lifting height: low-hanging hanger bars; inline scales on the belt; or underhung, low traverse rails (below the static rails) may all further reduce lifting height. Recessed rails may preserve lifting height.

If floor-based lifts are necessary, caregivers prefer floor-based transferring/lifting equipment that is easily maneuverable in tight spaces, fits under beds/gurneys, supports larger weight capacities, and rolls easily. According to Marras, Knapik, & Ferguson (2009), larger wheeled floor-based lifts are more maneuverable than smaller wheels, which means a tradeoff between ease of movement and fitting underneath some equipment. Flooring also affects maneuverability. Carpet provides resistance when trying to maneuver floor-based lifts, making them difficult to maneuver, putting employees at risk of injury (Marras, Knapik, & Ferguson, 2009). Motor-driven lifts can reduce the forces required, but they can make movement more complicated. No motor-driven powered standing assist device currently exists.

According to the Centers for Disease Control and Prevention (CDC), between 2009 and 2010, 35.9 percent of the U.S. population greater than 20 years of age was considered obese; with 69.2 percent of the population considered overweight (CDC, 2013). With this rise, our patient obesity population is also increasing, and thus it is important to have lifting capabilities to take care of these patients. Unfortunately, many types of expanded capacity equipment are bulky and difficult to maneuver or fit into rooms. It is important to find something that works well within your environment and that requires minimal effort.

When assessing transport equipment, the environment where it is used will need to be evaluated. Transport equipment may need to support bariatric patients, travel across long distances, and go up/down inclines. Equipment location and room design are sometimes the only way to address wheelchair mobility space constraints.

Many motorized stretchers provide easy turning and manageability and require only one caregiver to safely and easily provide transportation.

7. Storage Requirements

When purchasing equipment, it is important to consider the storage needs for each piece of equipment and its accessories. The more central the location, the more staff will use the product. To clinical staff, time is a factor in providing patient care. Alcoves or storage must be available for any purchased equipment, slings, slides, and other accessories. Maintaining accessible locations near patient care will provide quick and easy access for staff to utilize SPHM technology.

SPHM technology comes in many shapes and sizes. To ensure storage accommodations, it is important to have electrical access for charging systems. Lifts and slings need to be easily accessible and not buried behind other equipment and/or under other items.

Manufacturers' instructions will also need to be evaluated to ensure you can safely store the equipment at the proper temperature, humidity, etc. Not all equipment will function if the temperature is too hot or too cold. If the humidity is too high, the use of some equipment may also be hindered.

8. Appropriateness for Needed Tasks and Workplace Design

   Floor-based lifts will need to fit through doors, move smoothly over flooring, make smooth transitions between rooms, fit in patient care areas/rooms, and be used for necessary tasks. Consider the space required for lifting equipment, staff, and patients during transfers, ambulation, toileting, turning, and repositioning in bed and pulling up in bed. Other high-risk tasks to plan for also include picking a patient up off the floor, bathing, therapy services, holding extremities, pronating, etc. Determining the most appropriate pieces of equipment that will work best for the tasks conducted in an area will provide the most versatility for the money.

9. Provide Safety for Patient and Caregiver

   The purpose of providing this technology is to safely and efficiently provide mobility and care without causing harm to either the patient or the employee. In order to ensure this, each piece of equipment should be evaluated to ensure that it will prevent injury and not increase the likelihood of patient or staff harm.

   Despite the intention of SPHM technology, it is imperative that each product considered is reviewed for product recalls and/or safety alerts that have not been resolved before implementing into care. Contacting the product's primary manufacturer and searching for any safety alerts, recalls, and advisories through http://www.recalls.gov/, FDA (http://www.fda.gov/Safety/Recalls/default.htm), and the VA NCPS (http://www.patientsafety.va.gov/) can help determine if there are components that need to be changed, education that needs to be

incorporated into training, or if the product you are evaluating is safe for use. This is especially important for products sold by secondary sources.

Consistency and/or compatibility with existing equipment are essential factors to consider when choosing new equipment. Buying similar lifts that provide the same or similar functions, instead of different types of lifts with different slings and attachments, can impact employee competency, sling location, sling application, and ultimately patient and employee safety. For instance, having more than one ceiling lift manufacturer within a facility or within a patient care unit can lead to uncertainty in sling selection and lift use, placing both caregivers and patients at greater risk. If circumstances necessitate inclusion of more than one equipment manufacturer, it is important to maintain safety by avoiding mismatched parts, ensuring that accessories are compatible, and making sure all caregivers are comfortable with the variety of equipment they must use. In choosing equipment for an area, always consider the risk and expense associated with incompatible slings and the additional training cost, as well as the risk of confusion in emergent and non-emergent situations with a variety of equipment and slings.

Ensuring that the equipment you are looking to purchase is easy for the caregiver to learn how to use; comfortable for the patient; and does not compromise skin integrity, increase fall risk, or increase risk for the employee through manual manipulation is essential in product selection.

10. Provide Comfort to Patient

    Our goal in purchasing SPHM technology is to ensure its use to protect patients and caregivers. Sometimes equipment can be used for an extended period of time during treatment, transfer, bathing, etc. For these reasons, it is important to select products that will be relaxing and comfortable. Trials and pressure testing can help to guide this decision.

11. Ease of Operation

    Ensuring that the equipment under consideration is easy for the caregiver to learn how to use and easy to operate is essential in product selection. Minimal steps required for use will help the learning process and ensure that steps are not missed during use that could lead to dangerous consequences.

12. Evaluating Functionalities/Versatility

    Some vendors may provide different functionalities of equipment that other vendors may not have. For example, when evaluating equipment, it is important to ensure the ability for a fall recovery. Many pieces of equipment can be utilized to pick patients up off of the floor. It is important to analyze equipment that can function in this capacity. It is also important

to realize that though many ceiling lifts can go all the way to the floor, if the patient falls in the hallway or anywhere where they cannot access a ceiling lift, other equipment must be available to pick the patient up off the floor. Floor-based, full-body lifts and air-assisted lifting devices are good alternatives. Several pieces of equipment can be utilized for transferring, lifting, rehabilitation, and transfer to and from a car. Finding equipment that meets all or most patient handling and mobility needs can save money, space, and time.

13. Environmental Considerations

    Environmental concerns can be an issue. If maintaining a lift in a pool area or bathroom, make sure it will work with the temperature and/or humidity in that area. When storing equipment, ensure it is stored according to manufacturers' instructions. Access to electrical power is necessary in some instances, either to charge switchable batteries or plug the lift in for it to maintain a charge. For a lift in an ambulance bay, make sure the structural support is adequate, and the lift is protected from the elements.

14. Cleaning According to Manufacturers' Instructions

    The facility must have the ability to clean purchased equipment and accessories. Some products require special cleaning materials that may need to be purchased. All cleaning must follow manufacturers' instructions. Each product manual should contain cleaning instructions, and some even require a certain process of cleaning to maintain the integrity of the product.

    Slings require cleaning between patients. If the decision is to use reusable slings, it is important to have a system set up for cleaning slings. Some facilities wash slings on the unit, while others send slings to housekeeping to be laundered or use external resources for their cleaning. While slings are being cleaned, others will need to be available for use.

It is important to ensure that the above needs/concerns are considered before moving forward with a purchase. Compromising safety for efficiency or storage for ease of use will only create roadblocks that will hinder equipment use and decrease the value of your investment.

4.2.1.b. Focused Equipment Evaluations

Equipment evaluations that include staff, patients, and others who will interact with the equipment are essential. Having a multi-disciplinary group evaluate the equipment will provide a wide range of expertise. Members of this multi-disciplinary group should include front-line nursing, biomedical engineering, facilities management, patient safety, rehabilitation medical service/therapy, facility safety, infection control, and an SPHM facility coordinator (FC).

Importantly, each caregiver or person of the multi-disciplinary team evaluating the equipment must consider their own area's patient characteristics and needs for SPHM. Multiple front-line staff should be involved as they provide patient care every day to a specific population and will be able to advise as to what will and will not work with the patients, workplace flow, and work environment.

The evaluations can be conducted as a vendor fair in a large meeting room/auditorium with many vendors and types of equipment or as a trial of a single piece of equipment within the clinical area where the equipment will be used. In any type of evaluation, a survey or questionnaire must be completed by appropriate staff and others. Examples of these equipment surveys are found as Enclosures 4-1 and 4-2. Steps in holding a vendor or equipment fair are found in Enclosure 4-3, Patient Handling Equipment Fairs.

4.2.1.c. Vendor or Equipment Fair

During an equipment fair, vendors are invited to present their products on-site to the entire nursing staff, appropriate patient populations, and others, such as housekeeping and engineering staff. Product samples are set up and demonstrated within the hospital auditorium or large meeting room.

A vendor/equipment fair will provide front-line employees access to different types of equipment to determine which ones best meet their patient population needs. Staff will be able to get hands-on demonstrations and can evaluate which sling attachments, control functions, ease of movement, safety features, etc., will better work for them. It is best to have three to five competitive choices at your vendor fair that will meet your facility/location needs for staff to evaluate. Multi-disciplinary staff and patients are encouraged to examine each product and to provide feedback via a structured evaluation questionnaire or survey (Enclosures 4-1 and 4-2). Compilation of results from this rapid evaluation process is important in identifying the favored equipment.

4.2.1.d. Equipment Trials

Equipment trials are usually held in the location where the equipment will be used; for example, a proposed ceiling lift would be installed in a patient room or a lateral transfer device introduced in radiology. Because the equipment is used on the actual patients in the clinical unit/area of need, caregivers get a better feel for the equipment's match with their patient population. Trials help ensure functionality within the environment, ease of use by caregivers and patients, usefulness with patient population, storage ability, safety of product, durability, etc. Equipment may look or sound appropriate but may not work within the clinical area in need. Trials may also facilitate finding that the equipment is not of good quality. It is best to find this out through a trial, rather than after purchase, training, and implementation. It is important to trial a product even if it is the only one that meets your area's criteria. During an equipment trial, there is also more time to use and test the equipment when it is available for a period of time, such as a week or even a month, as compared to only minutes/hours during an

equipment/vendor fair. As with equipment vendor fairs, questionnaires or surveys should be used to analyze employee, patient, and others' reaction to the product. Examples of product evaluation tools can be found as Enclosures 4-1 and 4-2. Each facility may have its own equipment trial process used by logistics. Any of these survey tools can be gathered and results tallied to determine if this product is right for your facility/clinical unit/area.

4.3. References

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4.4. Enclosures

4-1 Product Evaluation Tool

4-2 Product Surveys

4-3 Patient Handling Equipment Fairs

Patient Assessment, Care Planning, and Algorithms for Safe Patient Handling and Mobility

5.1. Background

The algorithms, patient assessment, and care plan discussed in this chapter were originally developed, trialed, and approved for use by nursing staff from five healthcare organizations, including the Veterans Health Administration (VHA) and non-VHA healthcare organizations. The Veterans Integrated Service Network (VISN) 8, Patient Safety Center of Inquiry (Tampa, FL) led the design and development. An algorithm was developed for each high-risk transfer and repositioning tasks. They were designed to assist health care employees in selecting the safest equipment, number of staff, and techniques based on medical and physical characteristics of individual patients. These guidelines were first prepared based on scientific and professional information available in March 2001. At that time, they were tested with different patient populations in six clinical areas (Intensive Care Units; Acute Care Units; Nursing Home Care Units; Outpatient Areas and Clinics and Emergency Rooms; Operating and Recovery Rooms; and Spinal Cord Injury Units and Rehabilitation Units). Subsequent revisions have kept the spirit of the originals while accommodating new equipment and minimizing risks of patient or employee injury. The most recent versions of the algorithms were revised by VHA in 2014 and unified the standard and bariatric algorithms into one set for patients of all sizes. For more information regarding bariatric patient handling and mobility, consult the VHA Bariatric Safe Patient Handling and Mobility Guidebook.

Users of this guideline should periodically review this material to ensure that the advice herein is consistent with current reasonable clinical practice. As with any guideline, this content provides general direction; professional judgment is needed to ensure safety of patients and caregivers.

VHA Directive 2010-032, Safe Patient Handling Program and Facility Design, requires a patient assessment process that drives specific patient handling equipment recommendations for each individual patient.

The Association of periOperative Registered Nurses (AORN) convened a multi-disciplinary panel for 18 months to develop clinical tools to address musculoskeletal injury risks in the perioperative team. Experts from the National Institute for Occupational Safety and Health (NIOSH); VISN 8, Patient Safety Center of Inquiry (Tampa, FL); American Nurses Association (ANA); and AORN participated. These tools were based on research evidence and professional consensus and pilot tested in several facilities. Their tools and guidance

statement were published in 2007, and their clinical tools were included in the VHA Assessment Criteria and Care Plan and Algorithms revision dated March 2009. They are presented unchanged in this document.

The National Association of Orthopaedic Nurses (NAON) Safe Patient Handling and Movement Task Force, including representatives from NAON; VISN 8, Patient Safety Center of Inquiry; NIOSH; and the ANA, developed their algorithms and clinical tools for safe patient handling in 2006 and 2007 and published their guidance statement in early 2009. These algorithms and tools were also included in the VHA Assessment Criteria and Care Plan and Algorithms revision dated March 2009. They are presented unchanged in this document but may be revised.

Bay Pines VA Healthcare System developed and tested a scoring system in 2011 to make the assessment and handoff process simpler for caregivers. It consists of a Safe Patient Handling Score (SPHS) between 0 and 4 that can be connected to guidelines and passed on between caregivers throughout a hospital. This score is intended to be calculated by any caregiver, and not just a registered nurse (RN), so that any caregiver who sees a change in conditions can alter the score. Bay Pines and other VA systems that have adopted this system have reduced their injuries significantly (Gozzard, 2012).

Other methods exist for patient-specific assessment or evaluation of mobility and patient handling needs. The Banner Mobility Assessment Tool is a bedside assessment tool for nurses that divides patients into four categories of mobility level and recommends patient handling methods for each level, based on tests of patient ability performed at admission, each shift, and when patient conditions change (Boynton, T., Kelly, L, & Perez, A., 2014). Groups have also created mobility checks for use before mobilization, such as asking the patient to lift each leg and both arms, bridge in bed, sit at the side of the bed, stand while holding onto a secure object and advance and return each foot.

5.2. Purpose and Use of Patient Assessment, Care Planning, and Algorithms

Patient assessment criteria assist health care staff in considering critical patient characteristics that affect decisions for selecting the safest equipment and techniques for patient handling and mobility tasks. Health care staff members have often become accustomed to using whatever limited lifting aids are available, rather than carefully matching equipment to specific patient characteristics. It is expected that careful use of assessment and planning tools will improve safety for both patients and caregivers. Patients will receive assistance appropriate for their functional level, medical conditions, and cognitive status, ensuring safety and comfort. For caregivers, the goals are to decrease the incidence, severity, and costs of job-related injuries, as well as decreasing the intensity, duration, and frequency of job-related musculoskeletal pain and discomfort.

5.2.1. Assessment: Key Points for Caregivers

- Assess the patient's capability
- Assess the area and prepare it before acting
- Decide on equipment
- Know how to use equipment
- Plan lift and communicate with staff and patient
- Work together, including actions of more than one caregiver as well as the patient
- Have the right equipment available, in good working order, and conveniently located

5.2.2. Assessment: Key Criteria

- Ability of the patient to provide assistance
- Ability of the patient to bear weight, balance, and advance feet
- Upper extremity strength of the patient
- Ability of the patient to cooperate and follow instructions
- Patient height and weight
- Medical/cognitive fall risk
- Special circumstances likely to affect transfer or repositioning tasks, such as abdominal wounds, contractures, or presence of tubes, etc.
- Specific physician orders or physical therapy recommendations that relate to transferring or repositioning patients (for example, a patient with a knee or hip replacement may need a specific order or recommendation to maintain the correct angle of hip or knee flexion during transfer).

5.2.3. Care Plan: Considerations

- Type of task to be completed, e.g., transferring, repositioning, ambulating, or toileting
- Type of equipment/slings and assistive devices needed
- Number of caregivers needed to complete the task safely with selected equipment

5.2.4. Process for Using Assessment and Planning Criteria

The specific process for assessment and care planning may vary by facility, patient population, or level of care. However, key elements need to be

considered and integrated into the assessment and care planning process for safe patient handling and movement.

- Who completes the assessment?
- How often is assessment completed?
- How are the handling methods communicated to all staff, including caregivers not on the unit?
- How and when is the plan updated/revised?

5.3. Assessment Criteria, Algorithms, Ergonomic Tools, Scoring Systems, and Care Plan Resources

These enclosures discussed below can be used as guides when planning patient transfer, repositioning, and mobility tasks. These resources are targeted for persons directly involved with patient handling, movement, and mobility, such as registered nurses, licensed practical nurses, nursing assistants, orderlies, physical/occupational/kinesio therapists, radiology technicians, and patient care technicians.

Assessment Criteria and Care Plan for Safe Patient Handling and Movement (Original) (Enclosure 5-1) depicts a form that can be used in patient care areas for assessing patients. This was developed to ask the questions needed for the original Algorithms. The Bay Pines scoring tool was also developed based on these questions.

Safe Patient Handling and Mobility Patient Assessment/Care Plan (Expanded) (Enclosure 5-2) depicts a more comprehensive version of the assessment form in Enclosure 5-1. This may be used to answer all the questions that are asked within the 2014 VHA Algorithms.

These types of mobility assessments can be incorporated by a facility into assessments in electronic health records. It is worthwhile to consider how employees will receive information if they will not have time to look at patient charts before helping them, such as those who may be called into a room to help urgently or those receiving an inpatient in diagnostic areas.

VHA Safe Patient Handling and Mobility Algorithms (2014 revision) (Enclosure 5-3) contains algorithms and specific, general, and bariatric explanatory notes covering each of the following tasks:

- Algorithm 1: Transfer To/From Seated Positions: Bed to Chair, Chair to Chair, Chair to Exam Table
- Algorithm 2: Lateral Transfer to/from Supine Positions: Bed, Stretcher, Trolley, Procedure Table
- Algorithm 3: Repositioning in Bed

- Algorithm 4: Reposition in Chair: Wheelchair, Dependency Chair, or Other Chair
- Algorithm 5: Transport in Bed/Stretcher/Wheelchair
- Algorithm 6: Toileting
- Algorithm 7: Showering and Bathing
- Algorithm 8: Floor/Fall Recovery
- Algorithm 9: Transfer between Vehicle and Wheelchair, Powered Wheelchair, or Stretcher
- Algorithm 10: Ambulation
- Algorithm 11: Patient Handling Task Requiring Lifting of Extremities
- Algorithm 12: Bariatric Patient Handling Task Requiring Access to Abdominal Area
- Algorithm 13: Bariatric Patient Handling Task Requiring Access to Perineal Area

National Association of Orthopaedic Nurses (NAON) Algorithms and Clinical Tools for Safe Patient Handling in an Orthopaedic Setting [found listed under the Safe Patient Handling and Mobility Guidebook on the Center for Engineering & Occupational Safety and Health (CEOSH) guidebook Web page] contains four algorithms and two clinical tools specific for the orthopaedic care environment. These will be revised over time.

Association of periOperative Registered Nurses (AORN) Ergonomic Tools (Enclosure 5-4) contains seven clinical tools for safe patient handling and movement in the perioperative setting, including tools for lifting, carrying, pushing, and pulling equipment and supplies (Ergonomic Tools 1-7). These will be revised over time.

How to Obtain a Safe Patient Handling Score (SPHS) (Enclosure 5-5) contains a 2011 version of Safe Patient Handling Scoring and guidelines as developed by Bay Pines VA Healthcare System. It was edited slightly here to reflect the fact that bariatric algorithms no longer exist. Badge Buddy and communication sheet examples are also included in this document.

Safe Patient Handling-Patient Mobility Tool (Enclosure 5-6) contains a Safe Patient Handling-Patient Mobility Tool developed in Sioux Falls VA Health Care System and edited to remove brand names. This 0-4 scale is approximately the same as the Bay Pines scale.

5.4. References

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5.5. Enclosures

5-1 Assessment Criteria and Care Plan for Safe Patient Handling and Movement (Original)

5-2 Safe Patient Handling and Mobility Patient Assessment/Care Plan (Expanded)

5-3 VHA Safe Patient Handling and Mobility Algorithms

5-4 Association of periOperative Registered Nurses (AORN) Ergonomic Tools

5-5 How to Obtain a Safe Patient Handling Score

5-6 Safe Patient Handling-Patient Mobility Tool

Safe Patient Handling and Mobility Facility Coordinators/Program Managers

This chapter discusses the history of the Department of Veterans Affairs (VA) Safe Patient Handling and Mobility (SPHM) Facility Coordinators (FCs), their roles and responsibilities, methods that overcame training and education barriers related to inclusion in a VA system-wide program, FC support, FC extracurricular activities, and the relationship of FCs to operational program outcomes.

6.1. Background

The concept of an SPHM FC came about as a natural progression from the role of a research site coordinator during the initial VA SPHM study that took place in 23 long term care and spinal cord injury units in Veterans Integrated Service Network (VISN) 8 (2001-2002). The site coordinator's function was to be the liaison between the research team, unit peer leaders (UPLs), unit managers, and equipment manufacturers' representatives. Their research study duties were to work with the study project manager, health economist, and statisticians when necessary. (Nelson, Matz, Chen, Siddharthan, Lloyd, & Fragala, 2006)

They also formed close relationships with the safety office and occupational health staff because it was the site coordinator's role to interview injured employees, track patient handling injuries, and keep apprised of injured staff that experienced lost time and modified duty injuries throughout the duration of the study. As program managers, they facilitated installation of ceiling lifts and introduction of other patient handling equipment, trained UPLs and staff, and collaborated with contracting, facilities management, laundry, logistics/distribution, and others to ensure equipment and accessories were available, cleaned, and available in sufficient quantities. When the research study ended, the site coordinator positions were eliminated. However, leadership and management in one facility saw the benefits of the SPHM Program and supported the continuation of the position. In that facility, the SPHM and UPL Programs not only continued, but flourished. It was the hope that the UPL Program would continue without such leadership in other facilities. A few had limited management support, but in those with no SPHM Program leadership, and even with great efforts from UPL 'leaders,' the program either slowly or quickly deteriorated. In these facilities, unit managers did not support the UPLs in their desire to hold meetings, continue trainings, and replace UPLs lost to other units or facilities. There was no one to ensure adequate supplies of slings and to mentor/coach staff in SPHM and equipment use. Not only did these programs fade, but equipment use waned. A few facilities gave great efforts to continue their UPL program without an FC. Unfortunately, they were not successful.

These program declinations and lessons learned through results of a follow-up study to the original study showed that a program manager was essential to program success. Other facilities that were early adopters of the SPHM Program and implemented best practices prior to the fiscal year 2009 SPHM national program roll-out found that an FC was necessary. Consequently, when the national program was implemented, it was required that each facility have at least one FC, a person to take on responsibilities similar to those of the site coordinators from the original study (Hodgson, Matz, & Nelson, 2013).

6.2. National Roll-Out of SPHM Program

VA Central Office (VACO) leadership originally thought that FCs would be required for a few years to implement the program and move things along. That was an incorrect assumption. With over 7 years of implementing and maintaining the Veterans Health Administration (VHA) national program, it is evident that the FC position will be needed as long as there is an SPHM Program in place. FCs are a necessity for sustaining successful SPHM Programs. (Hodgson, Matz, & Nelson, 2013)

During the first 3 years of the national implementation, fiscal years 2009 through 2011, VACO paid FC salaries (0.5 FTEE per facility). After VACO was unable to continue funding these positions, the majority of the facilities kept the FCs in place, while some reduced their work hours for the position or gave them other responsibilities. Over time, additional facilities opted to decrease their SPHM support. The SPHM Program suffered in these facilities due to the inability to focus specifically on the facility SPHM Program. The overall FC consensus is that facilities need at least one FC to keep a program alive. Some larger facilities require more; one large facility still has one full time FC and two part time FCs. Some FCs have UPL back-ups that support their work. (Matz, 2015)

A few years after the national program implementation, the focus of the facility programs changed from technology and equipment training to nursing and patient care process changes, requiring ownership by a very different community within the system. In addition, a huge lesson learned was that the SPHM Program relied on almost every other service/department within a health care organization. Facilities management, purchasing, contracting, engineering projects, supply and distribution, housekeeping, education, infection prevention, and others impact and/or are impacted by the SPHM Program. These changes and lessons learned required different communication and leadership strategies from the FCs. Their positions became much more global and required them to be more adept in communication skills with a variety of disciplines. (Matz, 2010)

6.3. Facility Coordinator Position: Roles/Responsibilities

FCs provide leadership and assume continuing responsibility for the development, implementation, coordination, maintenance, and evaluation of the SPHM Program at the organizational level. This includes integrated programs that cross service and/or discipline lines and influence organizational mission, vision, values, and

strategic priorities. The SPHM FC works under the direction of facility leadership and with interdisciplinary teams to develop, implement, and evaluate appropriate SPHM goals and processes across the organization, with VISN SPHM experts, the VA VISN 8 Patient Safety Center of Inquiry (PSCI), and manufacturers of patient lifting equipment. The FC provides oversight of equipment selection and purchases to meet current and future needs for safe patient handling, while ensuring compliance with performance measures and clinical standards. He/she promotes evidence-based practice for SPHM in all clinical settings and evaluates program outcomes with the Office of Workers' Compensation Programs (OWCP), Safety, and Facilities Management. The FC possesses basic knowledge of/skills with information technology (e.g., Web, Microsoft Excel and Word). The VA FC is also responsible for other duties as assigned by their supervisor.

FCs come from a variety of backgrounds. The majority are from nursing, but there are also many from therapy. In addition, industrial hygiene and safety staff have successfully taken on this role (Nelson, Matz, Chen, Siddharthan, Lloyd, & Fragala, 2006). For these reasons, position descriptions vary. Samples of functional statements can be found in Enclosures 6-1, 6-2, and 6-3.

SPHM FC responsibilities include:

- Implementation, maintenance, and evaluation of the facilities' SPHM Program (including policy, procedures, culture, and infrastructure)
- Leadership, implementation, maintenance, and evaluation of the UPL Program
- UPL mentoring, coaching, education, and training
- Facility education and training related to SPHM for multiple stakeholder groups
- Ensuring that SPHM meets standards of care as established by governing bodies
- Following evidence-based practices
- Patient care ergonomic evaluations throughout the continuum of care
- Tracking, reviewing, and investigating injuries and incidents related to patient handling, both for staff and patients, and recommending methods to decrease injury risk
- Identification of needed SPHM equipment and proposal, oversight, and purchase of SPHM equipment
- Planning to meet SPHM needs in renovation or construction projects

- Collaboration with Safety and Infection Control for program performance and improved outcomes
- Communication of SPHM Program goals, initiatives, and advancements with key administrators and leaders
- Coordination with SPHM multi-disciplinary team and oversight committee
- Oversight as the expert for SPHM and bariatric care
- Ensuring ongoing maintenance of SPHM equipment
- Ensuring availability and safety of slings and other SPHM supplies
- Data collection and analysis to monitor program performance
- Facility-wide marketing of the SPHM Program
- Improve and sustain quality of care with use of SPHM Program
- Participation in SPHM-related technical advisory groups and special interest groups
- Participation in national and VISN conference calls and meetings

6.4. Training and Education

The VA SPHM Program includes an FC position located within each VA healthcare system, making their education and training challenging. The national SPHM Conferences were found to be the best way to overcome this difficulty. These conferences provide updates on the latest in safe patient handling science and technology, support meetings and discussions with VA and non-VA staff, and offer training directly related to the national VA program. During these national SPHM Conferences, FCs are able to pick and choose what conference sessions they need to attend to increase their knowledge base and improve their performance. In some years, FCs have attended specific VA training sessions where they were trained in coaching and mentoring, and given practice in crucial conversations. These VA-specific trainings have also included discussions of program issues and relayed best practices. One of the greatest benefits of the original VA sessions was the teambuilding that took place. The national program still benefits from the networking and relationships that were formed. New FCs can receive initial training when they attend the national SPHM Conference closest to their start date. They are also paired with a ‘seasoned’ FC mentor that assists them through the first months in their new position. In 2014, a special interest group came together to develop an SPHM Training Strategic Plan. The plan included training curricula for several levels of FCs, from new to ‘seasoned’ and those who took on the role of mentor for new FCs. The plan includes a self-assessment that identifies education and/or training needs with links and directions to locations on the SPHM Web site where FCs can find resources to

support their training needs. (Matz, 2015) Refer to Chapter 10, Developing a Safe Patient Handling and Mobility Policy, for further information regarding FC education and training.

6.5. Facility Coordinator Support

The SPHM National Program Manager (PM) position has been integral to the success of the VHA program and the success of the FCs. Presently, modifications to the position are underway. However, for the past 7 years, the primary role of the PM position was to support field implementation of the SPHM Program. The PM position also included VACO program management and administrative activities, collaborations with other VACO Offices, and national collaborations with research, educational, regulatory, and other organizations. The PM acted as a subject matter expert in patient care ergonomics and safe patient handling program implementation for 153 Facility SPHM FCs, 21 VISN Coordinators, and other affected staff throughout VHA. The PM released quarterly Action Items that were and are intended to assist FCs to align their programs with national program goals. These Action Items provide direction for successful program implementation and maintenance, and facilitate a level of program consistency throughout the VA nationally. The PM is the go-to person for FCs. (Matz, 2015) See Enclosure 6-4 for information regarding this position.

After a relatively short period of time, the VA SPHM FCs morphed into an incredible interconnected supportive team that provides support and information to each other on a regular, nearly daily basis. A Mentor Program developed as a result of this strong team spirit. The goal is to pair new FCs with 'seasoned' FCs to support the new FCs through the first several months of their position, and, in doing so, facilitate continued program implementation/maintenance in the new FCs facility. (Matz, 2015)

The national roll-out also included support for FCs at the regional or VISN level. VISN SPHM Coordinators, although established at the onset of the program, became much more involved and visible 1 to 2 years after initial VA-wide implementation. It was found that their status in the VISN and facility level assisted FCs in gaining support and solving problems that might be VISN-wide or at the facility level. In VISNs with active VISN Coordinators, oversight and involvement greatly benefited FCs and facilitated facility and VISN successes. VISN Coordinators are instrumental in facility, VISN, and national program management. (Hodgson, Matz, & Nelson, 2013) Most VISN Coordinators participate in monthly VISN Coordinator calls, and hold regular FC conference calls. Some support FCs and UPLs in face-to-face meetings and share information to educate/train and improve their programs. Their support and encouragement have made them an integral part of the SPHM Program.

Because most FCs are from clinical backgrounds, without knowledge of procurement criteria and processes or installation requirements and procedures, many questions were asked related to these matters. For this reason, national contracting and engineering liaisons were identified to provide assistance to FCs.

Union support at the local and national level was also found to be essential. (Matz, 2015)

6.6. Facility Coordinator Extracurricular Activities

As FCs matured in their role, they found gaps that needed to be addressed and determined that additional SPHM materials, resources, and direction were required. Many special interest groups (SIGs) or technical advisory groups (TAGs) were formed to address these issues/needs. The following are only a portion of the many SPHM TAGs or SIGs: SPHM App development, UPL Program oversight, development of a Bariatric Patient Handling Guide, review/revision of SPHM technology in Prosthetics and Home Care, and issues in mental health and design. Additional identified topics included algorithm update/redesign, transportation/escort staff high risk tasks, SPHM certification, FC training/orientation, patient handling injury definition, and the Mentor Program. Many FCs also became involved in research projects such as a National Institute for Occupational Safety and Health (NIOSH) study on bariatric patient handling. (Matz, 2015)

6.7. Relationship of Facility Coordinators to Program Outcomes

The work of FCs directly impacts the incidence and severity of patient handling injuries. Their collective force is demonstrated in the reduction in patient handling injuries in the VA. The national VHA overall Patient Handling Injury Rate for nurses dropped nearly 40 percent since the high point of 398 events/10,000 full-time workers in 2006 through 2012. (Hodgson, Matz, & Nelson, 2013)

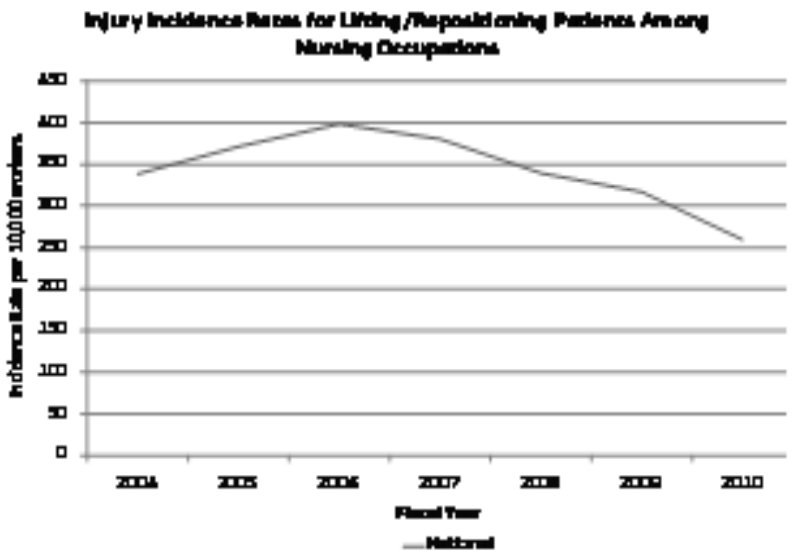

Figure 6-1: Injury Incidence Rates for Lifting/Repositioning Patients Among Nursing Occupations

Since the beginning of the VA National SPHM Program roll-out, the PSCI research staff, together with VHA Central Office program staff, developed reports for the national program, comparing VISNs (regions) as well as facilities within

each VISN. These VISN Reports were released in 2011 and were based on VISN and facility responses to both PSCI program evaluation data and a survey from the Center for Engineering & Occupational Safety and Health (CEOSH). These reports also included data from VHA's automated safety incident surveillance tracking system (ASISTS).

Two of the indicators of success from PSCI data relayed in the VISN Reports were associated with FC status: *Operational Performance,* a composite score of progress made in achieving VACO Program milestones, and *Program Elements Implementation,* a composite score reflecting activity in ten key program areas, e.g., technology, equipment competency, UPL Program, caregiver involvement in equipment selection, use of Safety Huddles, use of patient assessment, incorporation of SPHM into routine orientation of all new clinical employees, marketing at all levels, Bariatric Program, and policy. Facilities with full time FCs appeared to have stronger programs, and, in general, all VISNs made great strides in the extent to which the program was implemented, directly related to FC leadership and program management. (Powell-Cope, et al., 2014)

Figure 6-2 shows the SPHM Program total implementation scores by VISNs, based on facility scores. All VISNs made gains in overall implementation. The Total Implementation Score is a composite of three survey scores at 3 different data collection points over time. The three surveys were: (1) The Status of Implementation of Program Elements, (2) The Percentage of Appropriate Equipment Installed or Introduced in Therapy, Diagnostics, Long Term Care, Ambulatory Care, and Acute Care, and (3) Facility Readiness, which posed these questions:

- Does the facility have an adequate number of patient handling devices?
- Does the facility have an adequate number of slings for the handling devices?
- Do direct care providers use patient handling devices rather than manual patient handling?
- Is the facility well-situated to fully implement the SPHM Program? (Powell-Cope, et al., 2014)

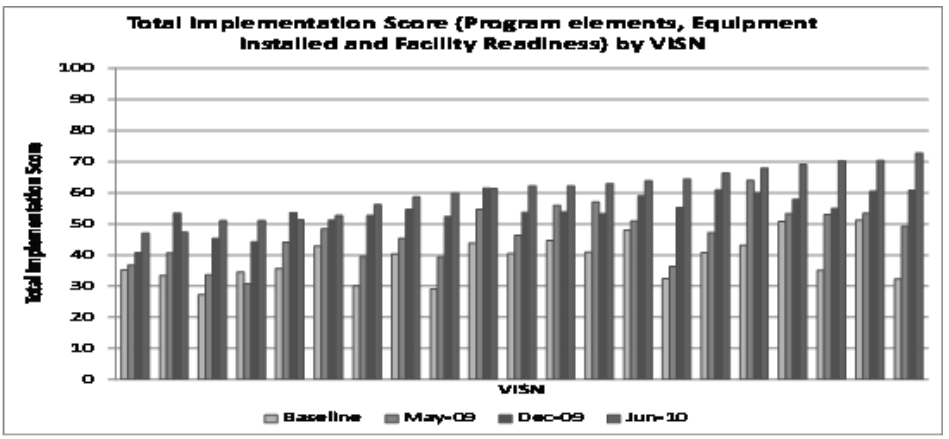

Figure 6-2: SPHM Program Total Implementation Scores

Results from the VHA CEOSH Operational SPHM Survey demonstrated that the FC position was associated with program implementation status. The national program originally provided salary support for 0.5 FTEE of each FC, but 31 percent of facilities chose to fund FCs as a full time FTEE, adding 0.5 FTEE from facility funds. In doing so, these facilities acknowledged the position complexity, the need to protect the FC time, and the need for more than 0.5 time allotment. Other facilities designated an individual as an FC without clearly identifying which elements of their other jobs they could discontinue, making this collateral duty. The majority of facilities designated a part-time position for the FC. Regardless of the position status, the position required far more than 20 hours per week. Overall, FC status was associated with improved program implementation.

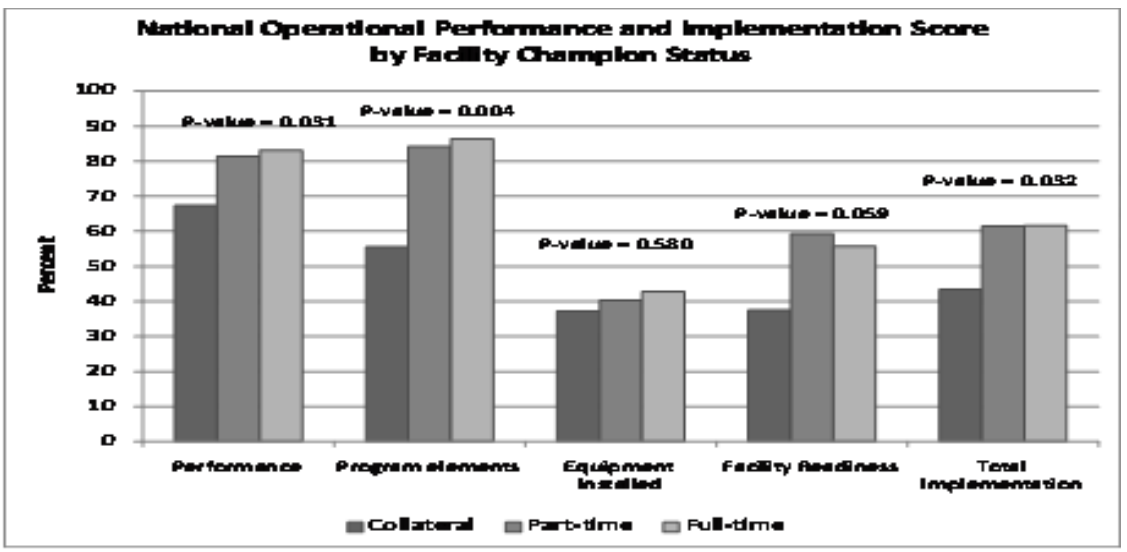

Figure 6-3: National Operational Performance and Implementation Score by Facility Champion Status

6.8. References

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6.9. Enclosures

6-1 Sample Position Description, Program Manager

6-2 Sample Performance Standards, Program Coordinator – Safe Patient Handling and Movement (SPHM), Physical Therapist

6-3 Sample Functional Statement, Safe Patient Handling Facility Coordinator, Registered Nurse: Nurse III

6-4 Safe Patient Handling and Mobility National Program Manager Duties


EOSH

Safe Patient Handling and Mobility Unit Peer Leaders

7.1. Background

In preparation for nationwide roll-out of a Safe Patient Handling and Mobility (SPHM) Program in 2008, the Veterans Health Administration (VHA) identified and trained SPHM facility coordinators (FC) at every VHA facility. The SPHM FCs were tasked with the implementation and management of their facilities' programs. Implementation of the SPHM Program included education on the program initiatives, selecting and purchasing equipment, coordinating installation of equipment, change strategies, and more. Possibly the most important roles of the FCs were to lead and train SPHM peer leaders in all clinical areas. Unit Peer Leaders (UPLs) were expected to be the change agents at the unit level for the SPHM Program. VHA Directive 2010-032, Safe Patient Handling Program and Facility Design, stated that the UPLs were fundamental to the success and compliance of the program. UPLs within VHA were previously called back injury resource nurses; other organizations have called them ergo rangers, ergo coaches, and other names. UPLs are the direct link in the transfer of SPHM information, staff compliance in the use of SPHM equipment, and successful program implementation within their respective patient care environments. Effective UPLs may be from any professional or paraprofessional discipline and must agree to carry out responsibilities to the best of their ability. UPLs are empowered to be autonomous, communicate direct care staff needs, and assist SPHM FCs to make decisions regarding SPHM Program succession planning.

7.2. Description of UPL Program

UPLs assist in building a culture of safety to support clinicians in providing safe patient care and safe working environments. UPL roles and responsibilities include facilitating the implementation of elements of the SPHM Program. They assist with the implementation of the SPHM Policy, patient-specific assessment/screening methods, and other key components. They train their co-workers on the fundamentals of the program and assist with monitoring and evaluating the program elements. They act as resources, coaches, and team leaders on their units or within their clinical areas. UPLs share their knowledge with their co-workers and with other UPLs in their facility and within the VHA. Ongoing communication among UPLs is vital to sustaining an SPHM Program and may include regularly scheduled face-to-face or conference call meetings. These meetings (formal or informal) are a place or time to share new information gained through Safety Huddles and other UPL activities. Regular discussions provide a forum for discussion, sharing of best practices and lessons learned, and mutual support.

7.3. Roles and Responsibilities

Refer to Enclosure 7-1 for roles and responsibilities.

7.4. Limitations

The degree of success of the clinical unit/area UPL Program is limited by the degree of management support. UPLs must have their manager/supervisors' backing for peers to recognize and respect the UPL role as essential. When management supports the role and responsibilities of the UPL and provides them time needed to attend meetings and perform related tasks to ensure their co-workers are current on the latest SPHM information and equipment competencies, the SPHM Program will thrive. Staff will be educated and up-to-date on equipment competencies and other necessary SPHM information. Staff and patient safety will improve.

It is recommended to provide one dedicated UPL per shift for each clinical area. Unfortunately, in the VHA, the UPL position has been, and continues to be, a collateral duty assignment. Staffing up to provide time to fulfill the UPL role or having a UPL position would greatly benefit the SPHM Program. Due to collateral duty status, UPLs responsible for direct patient care might have to request an adjustment to their work schedule, ensuring they have adequate time to accomplish their roles and responsibilities.

7.5. Organizational Leadership and Benefits

Leadership is vital at multiple levels: The UPL team needs leadership from the FC, and experienced UPLs can lead and mentor others. Top management and supervisors need to make it clear that the time UPLs spend on their duties is necessary and important and that UPLs are the experts on their units.

By leading staff to create a safer work environment and promoting a culture of safety, the UPL Program can address the following:

- **Injuries:** Reduce the incidence and severity of health care worker injuries.
- **Employer of Choice:** Improve job satisfaction, decrease turnover rates, decrease musculoskeletal discomfort/injuries, foster a sense of professionalism, and empower clinical staff.
- **Costs:** Reduce direct and indirect costs related to patient handling injuries.
- **Quality of Care:** Increase patient comfort, security, and dignity during patient handling, transfers, and mobilization; promote patient mobility and independence; enhance toileting outcomes and increase continence.
- **Patient Safety:** Decrease patient falls, skin tears, pressure ulcers, and abrasions.

- **Process Improvement:** Facilitate a proactive approach in perpetuating a culture of safety among patients and staff.

7.6. Monitoring Progress

The UPL Monthly Progress Log (Enclosure 7-2) is used to capture specifics of UPL activities in each clinical area/unit. This data should be collected weekly on initial implementation of the UPL Program for a set period of time (3-6 months, for example). Use the metrics from this initial time period as baseline information to be used at a later time for measuring UPL Program progress. After the initial period of time, completion of the logs should continue on at least a monthly basis. The frequency or content of this data collection can be adjusted based on programmatic needs or facility policy; however, the longer the time period between completing a UPL activity and recording it in the log, the less accurate the data.

7.7. Tools and Strategies for Implementation

7.7.1. Selection Criteria

UPL population may consist of the following disciplines: nurse assistants; registered nurses; licensed practical/vocational nurses; occupational therapists; physical therapists; kinesiotherapists; and laboratory/morgue, imaging, and other clinical staff. Any interested clinical staff member has the potential to be selected for this role. They must have an interest in staff and patient safety and be considered role models or mentors on their unit or clinical areas. UPLs should possess strong interpersonal skills, work well with others, and be able to take initiative and complete assignments in a timely manner. Ergonomic experience is not required. For UPLs with direct patient care responsibility, management can and is encouraged to adjust the UPLs' work schedules to ensure they have adequate time to accomplish their roles.

7.7.2. Training

UPLs need initial training to prepare them for their various responsibilities, including training, coaching, culture change, problem solving, difficult conversations, and super-user level comfort using SPHM equipment and patient-specific evaluations/scoring tools. They also need ongoing training and support to keep their topical knowledge fresh and to help them improve their programs and processes. The VHA SPHM Training and Education Strategic Plan (refer to Enclosure 9-1) includes objectives and methods to train UPLs from the novice level to the expert and mentor levels.

7.7.3. Administrative Support

Elements of administrative support can be found in Chapter 10, Developing a Safe Patient Handling and Mobility Policy.

7.8. References

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7.9. Enclosures

7-1 Safe Patient Handling and Mobility (SPHM) Unit Peer Leader Expected Roles and Responsibilities

7-2 Unit Peer Leader Monthly Process Log

Safety Huddles

8.1. Background

Safety Huddles are based on an after action review (AAR), a highly successful method of knowledge transfer that is used in high-performing organizations, such as the United States Army. Safety Huddles are a method for transferring knowledge a team has learned from doing a task in one setting to the next time that team does the task in a different setting (Dixon, 2000). This process moves unique knowledge that an individual holds into a group setting so that the knowledge can be integrated, understood by the whole team, and used when individuals face similar circumstances. Often, knowledge generated in work settings is not shared and therefore not usable.

8.2. Definition

Safety Huddles are a "communication vehicle…a fast, focused, and highly collaborative process" (Cooper & Meara, 2002, p.12). Huddles also reduce confusion, precluding the mentality of "I didn't know" or "nobody told me" (Hyde, 2008). Huddling can also facilitate the management of impending crises before they actually become problems (Cooper & Meara, 2002) or mitigate problems when they do occur. Huddles bring problems into the light (Setaro & Connolly, 2011), permitting face-to-face communication, timely responses to questions, efficient dissemination of relevant information, and the opportunity to plan for a systematic resolution (Dingley et al., 2008). Meaningful interactions that occur in Safety Huddles can help care providers debrief and share individual perspectives with colleagues. Huddles may also offer benefits in the form of enhanced interpersonal relationships, helping health care facilities achieve safe, reliable, and high-quality care. This can be an integral part of their journeys to become high-reliability organizations (Provost, S., Lanjam, H., Leykum, L., McDaniel, R., & Pugh, J., 2014).

Safety Huddles offer an effective means for learning from both actual incidents and near misses. It is an informal process in which there are no recriminations, reports are not forwarded to supervisors, and meetings are facilitated in the work area. During Safety Huddles, staff should feel free to share knowledge without fear of embarrassment or reproach. The advantage of Safety Huddles is that they become part of the facility practice to promote a culture of safety for patients and staff.

8.3. Guidelines for Safety Huddles

8.3.1. When Should Safety Huddles be Conducted?

Safety Huddles are most effective when held immediately or soon after every patient or staff safety near miss. Keep the meetings brief. They can be accomplished in as little as 15 minutes. When Safety Huddles are conducted on

a regular basis, staff will become more comfortable with the learning experience and not feel like they are being blamed for the event.

8.3.2. Who Should Attend Safety Huddles?

The patient and staff involved in a safety near miss should be invited to participate in the Safety Huddle. Each person's input is helpful to get a clear picture of what happened. The information received will aid in making appropriate recommendations to prevent similar incidents in the future.

8.3.3. What is the Structure of a Safety Huddle?

During the meeting, the leader asks the following questions:

- What happened to threaten patient or staff safety?
- What should have happened?
- What accounted for the difference?
- What corrective actions should be taken, or how could the same outcome be avoided next time?
- What is the follow-up plan, and who will take responsibility for implementing corrective actions?

Engage in open discussion based on objective facts without blaming others. Team members should feel free to discuss all the circumstances of an error or near miss. Keep only informal notes, and make them available to other staff if it will help them to avoid patient errors and staff injuries. There is no need to formalize notes or send them to supervisors. Keep in mind that the focus of Safety Huddles is a learning experience.

8.4. Benefits and Limitations of Safety Huddles

The Safety Huddle process provides positive opportunities and benefits for employees. An important benefit is that front line staff members are given an opportunity to make suggestions to incorporate changes in their work environment when they are involved in identifying problems and solutions. Safety Huddles also provide a means to implement changes in a timely manner, thus having an effect on injury prevention. Conducting a Safety Huddle requires little training and simply involves discussion, sharing ideas, and formulating plans for change in practice or procedures to prevent similar situations in the future.

One challenge for successful implementation is determining how to incorporate Safety Huddles as close to an event or near miss as possible. This is important because the staff and patient involved will have a clearer recollection of the event.

8.5. Tools and Strategies for Implementation

The following case studies (courtesy of Peggy Bone, Birmingham VA Medical Center) can be used to teach staff how to conduct Safety Huddles. After each

scenario, examples of questions that can be used to stimulate group discussion and analyze key points of the case study are provided.

8.5.1. Example 1

A lifting/repositioning incident occurred when emergency room (ER) employees attempted to manually lift a patient. ER employees huddled post-incident and debriefed.

8.5.1.a. What Happened

The Veteran became unresponsive in the front passenger seat of a Department of Veterans Affairs (VA) van. The vehicle presented to the ER receiving area. Three ER staff responded and tried to move her from the seat for transportation into the ER by way of manual lifting. The incident caused strain when the employee assumed the weight of patient's upper body in an awkward and tight position. The employee thought there were three total staff members assisting in the task but all those present did not assist.

8.5.1.b. What Should Have Happened

Transfer of unresponsive Veteran should have occurred from vehicle to stretcher without incident.

8.5.1.c. What Accounts for Difference/Contributing Issues

- Rapid response called for emergency care and additional staff assistance.
- Lack of the appropriate safe patient handling and mobility (SPHM) technology to facilitate safe patient lifting and transferring tasks from vehicles outside the ER receiving area.
- Sloped surface outside ER where transfer task took place.
- Egress from vehicle of nonresponsive patient requires awkward positioning of employees doing the task.
- Complicated transfers require nontraditional methods for transfer.

8.5.1.d. How to Prevent Next Time

- Seek additional staff and SPHM technology for assistance in emergencies.
- Explore appropriate equipment options for transfers in complex situations.

8.5.2. Example 2

A lifting/repositioning injury occurred when an employee attempted to prevent a patient fall.

8.5.2.a. What Happened

Patient ambulated to bathroom with assist by nurse. Patient noted to be unsteady on feet; however, nurse did not anticipate patient would have a syncopal episode. This incident occurred when the nurse attempted to prevent the patient fall.

8.5.2.b. What Should Have Happened

Patient ambulation to bathroom should have occurred with assist/no complications.

8.5.2.c. What Accounts for Difference/Contributing Issues

Unanticipated physiological event (fall).

8.5.2.d. How to Prevent Next Time

If assessment of the patient reveals a history of falls, weakness, or unsteady gait, patient and employee safety should be considered a priority. Use caution before ambulating the patient without appropriate assistive devices or mobility support. Options for injury prevention include physical therapy consult to obtain recommendations for assistive devices or equipment to support mobility and fall prevention. Other measures include actions taken to shorten the journey to the bathroom, such as the use of a bedside commode. Consider placing patient closer to the nurse's station and use a bed alarm, particularly with patients who are at high risk for falls/injury.

8.6. References

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SPHM Training Program

9.1. Culture Change

Many organizations make the mistake of purchasing safe patient handling and mobility (SPHM) equipment, creating a policy, and thinking that health care workers will use the equipment. Change within health care is slow. Leadership needs to be involved in the multi-faceted change process. Without both senior and mid-level management support, motivation, and encouragement, creating change will be difficult, if not impossible.

Barriers at the individual level must also be addressed. Caregivers do not easily modify the way they perform their work unless they know the change will have a positive impact on their patients. Initial training should emphasize SPHM and its positive impact on both employee safety and patient care. This will provide caregivers reasons for change without undermining their sense of autonomy or questioning if the change is necessary within their work environment. Awareness and knowledge are vital components of enabling change. (National Institute for Health and Clinical Excellence, 2007).

This chapter will describe training programs for diverse audiences at varying levels of competence. There are likely to be SPHM novices, competent practitioners, experts, and mentors. Therefore, training should be targeted to meet the needs of each audience and competency level.

9.2. Audiences and Levels of Competence

The Veterans Health Administration (VHA) developed an SPHM Training and Education Strategic Plan which is included as Enclosure 9-1. This plan incorporates education/training goals based on the type of audience [facility coordinators (FCs), unit peer leaders (UPLs), direct care providers, and indirect care providers/ancillary personnel]. There are objectives specific to each audience/goal, strategies to attain the objectives, and suggested actions/outcomes for each strategy. Target dates relay the length of time within which each objective should be completed, responsible parties, and resources suggested for each objective. For each objective, existing tools and processes are listed as well as suggestions for tool(s) development.

9.2.1. SPHM Training and Education Goal 1: Establish Training and Education for Facility Coordinator (FC)

The FC is the local leader of the program and is responsible for planning, implementing, and sustaining the SPHM Program. In addition to the FC's individual learning needs, the FC is responsible for meeting the education and training needs of additional audiences. New FCs require assistance to learn to successfully manage and lead their SPHM Programs. Seasoned VHA SPHM FCs are available to act as mentors for new FCs. Also, completing the SPHM

learning needs assessment and then learning materials, as needed, will facilitate timely competence in the role of FC. The learning needs assessment can be found on the VHA SPHM SharePoint site or in Enclosure 9-2. Mentors assist newly appointed FCs with learning needs through the use of various resources, including the national SPHM SharePoint site. To assist with the successful transition of a new FC, mentors may visit the mentee's facility and the mentee may also visit the mentor's facility. Finally, FCs are to participate in the SPHM e-mail collaborative, Veterans Integrated Service Network (VISN) and national SPHM calls, and, as appropriate, national new FC calls. Through these learning modalities, FCs exchange lessons learned, best practices, and information, all critical to foster continual learning as well as to maintain the unique SPHM national team spirit within the VHA FC group. In addition to the resources available through the SharePoint site, e-mail collaborative, and individual mentors, new FCs are encouraged to reach out to VISN points of contact (POCs) or the national SPHM program manager with any questions or concerns regarding program management. A significant source of education and training for FCs has come from attending national SPHM conferences that provide education and training in the latest technology, patient handling techniques, best practices, lessons learned, and more. A significant portion of the new FC training is provided by attending these conferences.

FC training objectives within the strategic plan include knowledge and skills assessment and development for novice, competent, and expert FCs. Mentorship objectives for assisting novice FCs are also included, as is succession planning information. Much of the training at the expert and mentor levels comes from working at the VISN and national level to improve and sustain SPHM Programs. In addition to internal development opportunities, FCs are encouraged to seek outside opportunities through professional associations. Mentor level FCs are expected to complete the VHA Certified Mentor Program.

A succession plan is particularly important to sustain momentum in an established SPHM Program; if a new coordinator is named without knowledge of the program and without files/documents from the previous FC, the facility's SPHM Program will lose momentum as the new FC learns and recreates documents, ergonomic evaluations, and training materials.

9.2.2. SPHM Training and Education Goal 2: Establish Training and Education for Unit Peer Leaders (UPLs)

The UPLs are trained by the FC and developed into leaders at the unit and local facility level. UPLs should be prepared to train and coach co-workers within their unit. Advanced UPLs can develop into experts who assist the FC beyond their unit level role and may mentor other UPLs. An expert or mentor UPL can be a good choice for FC succession planning. They can learn more of the FC role by being the acting FC or dedicated support for the FC. VISNs are encouraged to help their UPLs communicate and learn from each other during VISN-level conferences and/or conference calls.

UPL training objectives within the strategic plan include knowledge and skills assessment and development for novice, competent, and expert UPLs. Mentorship objectives for assisting novice UPLs are also included, as is succession planning information. Mentor-level UPLs are encouraged to become VHA certified mentors. Growing UPLs into active participants in all aspects of the program can benefit UPLs, units, and the facility.

9.2.3. SPHM Training and Education Goal 3: Establish Training and Education for Direct Care Providers (DCPs)

This group is wide and varied, but all need baseline/awareness training and unit-specific or discipline-specific training. DCPs include physicians, therapists, diagnostic technicians, and other front-line disciplines within the health care arena; do not limit this training to nursing staff. Ongoing training is necessary, and some disciplines will have annual competency evaluations while others will require periodic learning needs assessments. SPHM experts and advocates will emerge and be recognized by their peers, supervisors, or FC. They may become preceptors, UPLs, or even FCs. Note that all managers of direct care providers should have at least the level of training of their employees, plus any additional information needed to support the program.

9.2.4. SPHM Training and Education Goal 4: Establish Training and Education for Indirect Care Providers and Ancillary Personnel

This group is broader, more varied, and may need to be subdivided. Each requires determination of their specific educational needs.

1. Provide training for Logistics, Facilities Management, Engineering, Biomedical Engineering, and Contracting. These stakeholders should have education to assist in their understanding of their roles as they relate to SPHM facility design, construction, maintenance, and/or purchasing. Training should be based upon the amount of the interprofessional collaboration with the FC during facility design, construction, purchasing, and maintenance of SPHM technology. Training should be focused on the rationales behind SPHM, such as the variety of ways use of SPHM equipment improves the quality of patient care and supports mobility, protects workers, and facilitates cost savings.

2. Provide training for clinical educators. Clinical educators should receive training so they can serve as another resource to teach others. Training for these individuals should include training on all equipment that the educator will be using to train others, and should include competency and troubleshooting. In addition, clinical educators should understand the risks associated with manual lifting, national and facility policies and procedures, and appropriate points of contact should questions arise. If clinical educators will be heavily involved in training staff, they should receive the same training as the UPLs.

3. Provide awareness and appropriate hands-on training for police and transport. Each of these groups may need to handle patients in less-controlled environments than DPC staff, including uncooperative patients or patients in home environments. FCs should work with facility leadership to determine the appropriate equipment for use by this population and ensure that education and hands-on training is provided. Police and transport professionals need to know why SPHM is important, how to keep themselves safe, and how to use the SPHM technology options available.

4. Develop and provide a training plan for SPHM VISN POC. The VISN POCs for SPHM vary significantly in background, time, and leadership support. All VISN POCs need to know the requirements and benefits of the program, their role in the program, communication methods available for them and to the FCs, and how to support the FCs and UPLs. VISN POCs are often relied on to find mentors for new FCs, find equipment and training funding, and coordinate VISN efforts, such as UPL conferences and VISN-wide SPHM technology purchases.

5. Develop and provide awareness training for, but not limited to, the following employees: laundry, patient safety, environmental management service, hospital administration, medical media, human resources, workers' compensation, fiscal, infection control, unions, social workers, psychologists, volunteers, patient advocates, business managers/administrative officers, unit clerks/secretaries, and valet. These groups need to know the goals and initiatives of the SPHM Program, how the program interfaces with their work, and the role of the FC.

6. Provide initial and ongoing training for indirect care providers, including supervisors/managers, employee health personnel, safety staff, and occupational health specialists. This group should have a clear understanding of the role of the FC, the goals and objectives for the SPHM Program, research as it relates to the SPHM Program, the importance of identification and proper reporting of employee injuries, and, in some instances, use of equipment available for those they supervise. This group should communicate directly with the FC to ensure that timely and appropriate interventions are made to drive key program performance.

7. Establish training and education for the patient and their families. Patients and their families should be educated related to SPHM and available equipment. In alliance with the model of Veteran-centered care, Veterans and their families should be encouraged to advocate for the inclusion of SPHM into their individualized plans of care and should receive education specific to the type of equipment that will be utilized. Both the patient and their family should receive education that is formatted in a style to best meet the learner's need; providing patients and their families/friends with

written brochures describing the program and equipment facilitates education and acceptance.

9.3. Designing an Effective Training Program

The main purpose of training is to ensure that the employees obtain skill sets required to perform their job functions competently and safely. When planning a training session there are several things to think about: What are the overall objectives? Who is the target audience? What is being taught and by what method? What form of evaluation will be used?

9.3.1. Goals

In defining goals, it is important to think about the end result - for employees to learn and maintain the information and integrate it effectively into their work area. Having measurable outcomes will assist in leading the conversation and education toward the intended goals and determining whether the objectives have been met. Measuring the outcomes can be completed through pre- and post-tests, observations of return demonstration, and questionnaires (Articlesbase, 2009).

9.3.2. Audience

Target audiences will vary; therefore, it is important to identify the audience and the level of knowledge they have before determining the training needs. Prior to creating a training plan, it is important to conduct a learning needs assessment to determine the educational needs for the targeted audience. General patient care staff, administrators, nursing care leaders, or content experts, such as UPLs, have different educational needs and may require modified learning. These variables play a part in how, and in what capacity, staff members are trained.

In addition to knowing the target audience, it is important to understand the location where the target audience works. For example, nursing staff need a different training plan than physical therapy or radiology staff. It is also important to consider that employees within the same discipline have working environments that may vary; therefore, educational strategies should be employed that best influence and educate the individual learning audience.

Finally, it is important to consider the key drivers for each audience. In other words, what is important to the learner and what will likely motivate them to change their current practice? In relaying restorative staff nurses' injury rates it is important to include physical therapy's musculoskeletal rates as the type of work they are providing is similar. Supervisors may be more affected by the impact of absent, fatigued, and modified-duty staff on their unit. Executive leadership might be influenced by the effects on quality of care, patient satisfaction, and cost benefits. Focus on the target audience to provide maximum learning impact, and incorporate data and training techniques specific to the learning group.

9.3.3. What to Teach and How

Content should be evidence-based and geared toward adult learners. It is important to use current, peer-reviewed studies to ensure accurate, evidence-based material is provided within the learning environment. Professionals prefer evidence-based studies and outcomes so they can see proven benefits of the necessary change, rather than view the change as an obstacle to what they currently practice. The benefits and outcomes related to employee and patient safety are profound, and staff members are likely to listen if they hear positive outcomes in these two areas. Providing evidence-based material that also includes the prevention of pressure ulcers, falls, increasing mobility, decreasing hospital stay, and other outcomes that improve patient and staff satisfaction can be motivating factors for changes in staff thought processes related to SPHM initiatives.

Adult learners obtain and retain information in a variety of ways. Learners learn differently using all senses. Incorporate a variety of teaching strategies that use multiple learning styles. Some are visual learners, while others retain information from listening, and others from a hands-on approach. Visual learners gain the most information through graphs, diagrams, illustrations, hand-outs, PowerPoint presentations, and video display. Auditory learners learn best through tapes, speeches, and discussions. Tactile learners maintain information from doing the process or procedure themselves (Learning Guide.org, 2013).

9.3.4. Ensuring Competency

Ensuring competence in the use of potentially high-risk technology is imperative to ensure patient and employee safety. Demonstration of competence can be determined through pre- and post-tests, observation of return demonstration, evidence of daily work, etc. (Articlesbase, 2009).

VHA uses competency evaluations for nursing staff to demonstrate knowledge and competence to use SPHM technology, as well as performing specified tasks. There are many competency assessment structures that can be utilized; however, they all need to contain basic elements. Emergency applications, methods of use, weight limits, maintenance, and cleaning processes should be included. It is important to document the method of evaluation, such as observation, verbalization, and/or demonstration. When ensuring the competency of evaluators, it is important to determine whether or not they are able to objectively evaluate the task competency of others. The competency may also include a self-assessment, giving the learner the opportunity to evaluate their ability to perform the competency task. Areas for improvement should be relayed to the caregiver and nurse manager/supervisor. The completion of these competencies allows supervisors to ensure that staff members are trained and competent to use the equipment when providing care to patients. Enclosure 9-3 contains sample competency forms.

9.3.5. Providing Access to Educational Materials

It is important for staff to be able to locate information regarding SPHM technology and patient-specific screening and assessment methods in a timely manner. Reference materials should be readily accessible to staff. Locations such as SharePoint sites, equipment manuals, or SPHM UPL binders on each unit can provide quick, easy access.

9.4. What to Include in the Training Program

Training is an important aspect in preventing musculoskeletal injuries and disorders in the health care field. Some important aspects to include in a comprehensive SPHM Training Program are employee risk factors, patient safety, and SPHM technology training. Additional tools, such as algorithms and scoring systems, can also prove beneficial in assisting staff in determining which type of SPHM technology to use for which patients. These are discussed further in Chapter 5, Patient Assessment, Care Planning, and Algorithms for Safe Patient Handling and Mobility.

9.4.1. Employee Risk Factors

Training on SPHM concepts can increase awareness of risk to the health care professional. Often staff members only pay attention to what they need to do to protect the patient; however, it is imperative that they also see the risk they are putting themselves in and the overall effect it can have on patient care. The health care industry is one of the top professions that sustain musculoskeletal injuries (Bureau of Labor Statistics, 2013). It is important to educate staff that everyday tasks, such as turning and repositioning, static work posture, heavy load lifting, and frequent bending and twisting, put wear and tear on the body that can lead to significant injuries (National Research Council/Institute of Medicine, 2001). Many nurses have left the bedside, seeking alternative, less hazardous forms of work due to musculoskeletal injuries. Caregivers who make a conscious effort to use SPHM technology may avoid injury and are more likely to remain in the workplace until they choose to leave.

To reach the interests of a particular group of staff, it is important to examine what tasks they consider difficult or hazardous and what injuries have occurred in similar areas. Tracking injuries that occur in each area makes it possible to speak to and educate staff and management about their injury rates. Having an opportunity to ask questions, listen, and focus on their perceived risks can help caregivers feel like the educator is listening to their concerns. Asking staff to identify and rank their high-risk tasks will make it easier to focus on their perceived risks. Enclosure 3-2, Tool for Prioritizing High-Risk Patient Handling Tasks, may be used for this purpose.

9.4.2. Patient Risk

The educational program should also illustrate the positive effects on patient safety. Often caregivers are willing to put themselves at risk to take care of their patients; however, while doing this, they are also putting patients at risk by

completing patient handling tasks unsafely. Practice can be improved when employees are aware of potential improvements in patient outcomes from SPHM, including increased strength and balance, decreased risk of falls, less pain/discomfort, improved sense of security, and less friction and shearing that facilitate pressure ulcer prevention. Patient testimonials may also prove beneficial.

9.4.3. Equipment Training

SPHM technology has a significant, positive impact on patients' and employees' safety; however, if not used correctly can have a substantial negative impact. For example, not using the correct sling on a patient can put the patient at risk for sliding out of the sling. Mismatching lifts with inappropriate slings can result in injury.

When new equipment is purchased and introduced, comprehensive education is required. It is important for staff to become familiar with each new piece in a controlled environment before using it on patients. Experts, such as the vendor, FC, or UPL, are the best sources for equipment introduction and training. They can help provide a smooth transition and facilitate change in practice for caregivers. If equipment vendors are unable to assist in hands-on practice with patients, the FC or UPLs become the resource for staff until they become comfortable with using the new equipment.

Manuals must be readily accessible to staff in the areas where equipment is in use.

For new staff or new equipment, allow time for hands-on use as well as experience with every safety feature and awareness of what could go wrong, the potential consequences, and how to prevent problems. Include sling inspection that is required before use on a patient.

Additional training in high-risk units, such as acute psychiatry, geropsychiatry, dementia units, and restorative nursing care is necessary. This population has many psychological, psychosocial, and cognitive impairments that can influence the type and way SPHM technology is utilized. For example, there are certain pieces of equipment that cannot be used if a patient is unable to follow directions or is combative. In order to use SPHM technology safely with these patients, specialized approaches need to be taken to ensure calm client interaction (Ferns, T., Cork, A., & Rew, M., 2005).

Specialized training for therapy and restorative nursing staff is necessary as many pieces of equipment can be utilized for strengthening and reconditioning purposes. Additional training will be needed to show these staff members transfer slides and/or slings that can assist in active and passive range of motion. Slides can also be used to assist clients in sitting up on the side of the bed. Additional education should be provided regarding the use of lifts to assist in ambulation, lower and upper extremity strengthening, and improving balance, to name a few.

Training is also necessary for patients, family, and caregivers who will have SPHM technology introduced in their home environment.

9.5. Temporarily Reassigned, Float Pool, and Agency Staff and Students

Although clinical area/unit staff members are at a high risk for injury, there are also other groups to consider. Temporarily reassigned, float pool, and agency staff, as well as students, are at risk as they may not be familiar with the equipment being used and/or the workflow of the unit. As these staff can arrive on units with little or no training, it is important to prepare for them.

Float and agency staff members generally go to a different area each day, depending on where the needs are. Temporarily reassigned staff can be pulled to unfamiliar units. Because these two classifications of staff are assigned throughout the facility, they need to know the location of equipment, slings, and safe patient handling accessories in each unit they travel to. Also the equipment itself may be entirely different from one place to another. For example, the equipment in psychiatry will vary compared to the equipment in a restorative unit or nursing clinic. Unit content experts, such as UPLs, are ideal to provide training and ensure competence of these staff members with unit-specific equipment. If the UPL is not available, then the charge nurse or nurse manager must provide the education and ensure competency of those who are new to the unit. Just-in-time training for unit-specific SPHM technology can help relay information for these employees; however, does not result in competence in equipment use.

Students may be at risk for musculoskeletal injuries because they are unfamiliar with SPHM technology and how to safely and competently use it. Students should receive hands-on SPHM technology training. Remember, a facility's SPHM Program can make it an employer of choice. It is important to encourage students to ask about facility SPHM technology that is available when they are applying for jobs, thus promoting your facility as one of their safe choices.

Following the introduction into SPHM and its concepts, the temporarily assigned caregiver may feel more comfortable with SPHM concepts and using SPHM technology in their assigned area. In addition to education, ensuring a team approach with new/assigned staff can provide the employee with the support and help needed to complete unfamiliar tasks. This will provide the temporarily assigned caregiver with the mental, physical, and social support during their transition to the new area.

9.6. Training Documentation

Training records should be maintained to provide a means of tracking the staff members that were educated/trained and the subject matter taught. Leadership should take care to ensure that all equipment-based training is consistent and standardized based upon written policies, procedures, or memorandums and meets the requirements established by governing bodies. Although various approaches may be utilized, it is important that the learners, educators, and leadership are in agreement with the approach that is utilized.

9.7. Special Methods: Simulation, Case Studies, and Online Training

Education and training should be offered in various modalities to enhance the user's learning experience. Advancements in technology continue to offer new and innovative ways to facilitate training, including the use of simulated clinical experience and online training. In addition, interactive methods, including case studies and role playing, offer even more opportunities for educating and training.

Simulation, either alone or in conjunction with case studies, offers an opportunity for learners to practice or simulate the various skill sets they are learning on a mannequin or person pretending to be a patient. This direct application of learned knowledge enhances learners' retention and allows educators to validate the ability to apply abstract thoughts to concrete situations. Simulations used for other clinical topics should incorporate the use of SPHM technology where appropriate. An example is training on foot wound care. During the simulated training, a lift with a limb sling should be used to lift the leg to provide access to the foot rather than manually lifting the leg. In addition, specific simulations related to the care of patients with mobility needs should be included in training when possible.

Online training may be provided in multiple modalities. Training may be offered via a learning management system that facilitates event recording and also offers opportunity to award learning credit. Regardless of the time, these type of trainings offer users the ability to access the training at various times and from various locations. This type of training is especially useful for learners that are off-site or work during nontraditional business hours. Online resources, such as the national SPHM SharePoint site, may be used by a mentor to guide a mentee through the learning experience.

Case studies or role playing are similar to the simulated experience except that they do not involve the use of a mannequin or person acting in the role of the patient. Case studies allow learners to make decisions based upon information given within the study. This process allows the learners to make decisions and then reflect on those decisions to determine the appropriateness of their actions. Case studies are useful in multiple educational situations, but are best utilized in group settings where individuals are able to learn from the experiences and opinions of others.

9.8. References

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9.9. Enclosures

9-1 Veterans Health Administration (VHA) Safe Patient Handling and Mobility (SPHM) Training and Education Strategic Plan

9-2 Veterans Health Administration (VHA) Safe Patient Handling and Mobility (SPHM) Facility Coordinator (FC) Development Materials Self-Assessment

9-3 Sample Competency Skills Validation


EOSH

Developing a Safe Patient Handling and Mobility Policy

10.1. Introduction

A Safe Patient Handling and Mobility (SPHM) Policy is intended for use in any clinical unit or area where patient handling, movement, or mobilization occurs. It is considered just one part of a comprehensive approach to preventing musculoskeletal injuries in staff and improving the quality and safety of patient care. Enclosure 10-1, Sample Safe Patient Handling and Mobility Policy, draws from VHA Directive 2010-032, Safe Patient Handling Program and Facility Design. Other pertinent guidelines include the American Nurses Association (ANA) Safe Patient Handling and Mobility (SPHM) Interprofessional National Standards, International Organization for Standardization (ISO) Technical Report 12296, and Facility Guidelines Institute (FGI) Guidelines for Design and Constructions of Hospitals and Outpatient Facilities and Guidelines for Design and Constructions of Residential Health, Care, and Support Facilities.

An SPHM policy identifies expectations that staff will use the safest techniques to accomplish patient handling, movement, and mobilization and that administration will provide equipment and resources to support staff efforts. Staff retraining is indicated if employees are observed by supervisor or peers not following safe protocols for the handling, movement, and mobilization of patients. This policy should be used to educate, encourage, and facilitate increased use of SPHM technology.

The policy calls for staff to avoid manual handling in excess of 35 pounds in the best of circumstances in virtually all patient care situations; however, this policy cannot succeed unless other components of SPHM Programs have been put in place. It also highlights duties of employees, facility directors, supervisors, SPHM facility coordinators (FCs), unit peer leaders (UPLs), engineering staff, and others as applicable to assist in SPHM Programs.

The previous title, Safe Patient Handling and 'Movement', has been changed to Safe Patient Handling and 'Mobility'. Research documents the great benefits of patient mobilization and the negative consequences of immobility. SPHM technology facilitates mobilization without adding risk to caregivers or patients. Evidence linking the benefits of SPHM to mobilization is emerging, and organizations are responsible to stay current in evidence-based SPHM practice.

Direct care providers should be aware of their own physiologic limitations and plan movement prior to performing the patient handling and mobility task. Situational awareness and planning prior to performing these tasks should always be considered as unexpected events may occur during the process.

10.2. Implementation of a Safe Patient Handling and Mobility Policy

To be successful, critical infrastructure should be in place before the SPHM policy is implemented. This includes:

- Adequate number and variety of patient handling aids and SPHM technology in each patient care area where patient handling and mobilization occurs.
- Training and competency in the use of technology for all caregivers who move, handle, and mobilize patients.
- Training and competency in patient handling and mobility assessments and/or screening tools for all caregivers who move, handle, and mobilize patients.
- Administrators and supervisors who facilitate program implementation and enforcement.
- Facility and clinical unit/area program leadership (SPHM FC, UPLs).
- Facility committee, including program stakeholders, that oversees and supports the facility SPHM Program.
- Collaboration with stakeholders, including safety, human resources, worker's compensation, engineering, contracting, purchasing, supply and distribution, infection prevention, logistics, therapy, wound care, and others as applicable.
- Knowledge transfer and change strategies, such as Safety Huddles, algorithms, hand-off communication, mentors, preceptors, etc.

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10.4. Enclosure

10-1 Sample Safe Patient Handling and Mobility Policy


EOSH

Program Evaluation and Outcome Measures

11.1. Introduction

Program evaluation is necessary in order to improve quality, defend program value, guide future interventions, and disseminate results. The American Nurses Association (ANA) (2013) Safe Patient Handling and Mobility (SPHM) Interprofessional National Standards recommend that organizations establish a comprehensive evaluation system to include the planning phase, which is based on the goals of the SPHM Program. Outcomes are the consequences or effects of an intervention, action, policy, or program under study. In order to properly measure an outcome, it needs to first be clearly defined. The purpose of this chapter is to present a brief description of methodology and instruments that can be used to evaluate SPHM Programs designed to reduce the incidence and severity of job-related injuries related to patient handling and mobility tasks. These methods and tools are appropriate for evaluations across all interprofessional settings and populations, including inpatient and outpatient patient care areas, non-patient-care settings where patients are transported or assisted, and home or community care settings where patients need help with mobility.

11.2. Evaluation Design

Evaluators should think in advance about what each chosen metric means and if the metric is impacted by related factors. One option to evaluate a specific intervention is a pre/post design that allows you to evaluate differences before and after an intervention. To minimize threats to validity and biases from this type of design, a time series design can be used. The time series approach involves data collection at a series of data points before and after the intervention. For example, track injuries for 1 year before instituting an intervention and also 1 year after the intervention is in place. It is important to establish and collect baseline data (pre-intervention data) prior to implementing interventions in order to make comparisons after a period of time.

Another evaluation design includes control groups. For a study of a particular intervention, a control group can facilitate making distinctions between effects of the intervention and effects of other aspects of a program and/or changes in play. The more similar these groups are, the more valid the comparison. However, as SPHM becomes the rule and not the exception, controls within Veterans Health Administration (VHA) may be harder to find. Most evaluations involving long-standing programs will be either retrospective or based on continued data collection initiated when the program was originally implemented. A health care organization is likely to maintain multiple efforts aimed toward improving quality or reducing the frequency and severity of injuries and adverse events. For this

reason, it is important to be aware of and communicate conditions and/or efforts that affect outcomes tracked.

The evaluation process should include process and outcome measures based on the maturity of the SPHM Program (ANA, 2013). Lagging and leading indicators should be measured. Lagging indicators are usually output oriented and easy to measure, but hard to improve or influence. Leading indicators are input oriented, hard to measure, and usually easy to influence. For example, injury rates are lagging indicators, while measurements of equipment use or Safety Huddle activity are leading indicators that may indicate the engagement of the workforce in the program.

11.3. Measuring Outcomes

Though not an exhaustive list, the following are possible metrics for an SPHM Program evaluation:

- Rates/incidence of reported caregiver injuries categorized as patient handling and repositioning [from Automated Safety Incident Surveillance Tracking System (ASISTS)]. These injuries include those related to all patient handling and mobility activities.
- Severity of Injuries: Number of days away from work due to lost time patient handling injury. Number of days injured employee is placed on modified duty due to patient handling injury. Number of lost and number of modified duty injuries due to patient handling.
- Intensity, duration, and frequency of musculoskeletal discomfort.
- Job satisfaction.
- Acceptance of and adherence to program components.
- Competency and/or training results.
- Turnover.
- Absenteeism.
- Health care utilization for occupational musculoskeletal disorders associated with injuries related to patient handling.
- Satisfaction of direct care providers regarding equipment availability.
- Patient mobility within a unit.
- Patient injuries related to patient handling, movement, and mobility.
- Patient injuries related to use or non-use of SPHM technology.
- Fall rates (especially the subset related to patient transfer).

- Hospital-acquired pressure ulcer (HAPU) rates.
- Activity of and time used by facility coordinators (FCs) and unit peer leaders (UPLs).
- Steering committee activity or results.
- Perceived leadership support.
- Cost benefit and cost savings of a program.

Evaluating all of these outcomes in one program may be difficult; therefore, it is recommended to choose a limited number of outcomes. Bear in mind that reported injuries are considered lagging indicators; you can measure compliance and attitudes before effects on injury rates are visible. Variations in injury rates are seen in different clinical units/organizations and are affected by different cultures of safety and injury reporting. Underreporting of injuries is commonplace, especially when caregivers feel their supervisors are not concerned for their welfare or they may be blamed for their injuries (Brown, et al., 2005).

Many evaluation methodologies can be used to measure outcomes, and it is advisable to consider the strengths and weaknesses of each. When using electronic databases for current or retrospective information, ask the data source expert for any rules that have changed or any weaknesses in the data. For example, injury recording requirements or practices might have changed in previous years or data systems that are unable to update lost and modified duty days may result in inaccurate data. For instance, in a current year, an injured worker may be on modified duty for several months, but after a period of time, the facility injury report must be submitted and any modified duty time after submission is lost. Some injuries have accumulated costs for 30 years or more, and if the Occupational Safety & Health Administration (OSHA) 300 log stops reporting lost days at 180 days, the full effect of the injury is not captured by OSHA log information.

Self-reported information on perceptions of high-risk tasks or discomfort, for instance, can be collected via the use of surveys or paper and pencil tests where the participants select answers from various choices. Surveys can be mailed, available over the Internet, or accomplished through an interview. A combination of data collection methods may be able to reach more people and are acceptable as long as the results are comparable. The focus group methodology provides qualitative data, which is analyzed differently from quantitative data. Qualitative data can also be obtained from surveys and questionnaires. Focus groups are helpful when surveys/questionnaires cannot satisfactorily address the concerns/questions at hand. Elnitsky, C.A., Powell-Cope, G., Besterman-Dahan, K., Rugs, D., & Ullrich, P.M. (2015) used focus groups in SPHM Program implementation research. Limited data on safety and culture perception may also

be accessible from other Department of Veterans Affairs (VA) surveys, such as the Safety Perception Survey or All Employee Survey.

Another method to use when a large amount of diverse data is being gathered is a data log. Logs provide a set of information provided by the participant regarding activities, opinions, or actions for a determined length of time (daily, weekly, or monthly). In a Musculoskeletal Injury Program, a log can be used to track activities of a UPL or observations of equipment used during patient transfers. Lastly, performance indicators measure the participants' achievement of a task or understanding of a concept in order to assess if they are completing a skill or task correctly, such as the use of a lifting device.

If survey methodology is to be utilized, appropriate selection of the evaluation tools is important. In the best of situations, the optimum way to assess outcomes is to select a pre-made tool with strong psychometric properties (e.g., validity and reliability) designed specifically for the needs of your program. However, finding such a tool that measures the outcome desired from your particular program or intervention may be problematic. In those cases one might develop a customized tool. Care and consideration should be put into the construction of any new tool. The tool should be constructed by the consensus of subject matter experts and pilot tested with a comparable population to the population under study.

It is important to consider developing a plan for quality improvement and a process to disseminate findings to all stakeholders of the SPHM Program (ANA, 2013). The importance of disseminating findings cannot be over-stressed. Always relay outcomes to the appropriate staff, for instance, during front-line staff, management, and/or organizational meetings. Also, data and/or study results can be presented as printed materials, through e-mail messages, and/or as online data summaries.

11.4. Evaluation Tools for Common SPHM Outcomes

11.4.1. Incidence/Severity of Injuries

The cornerstone of any Musculoskeletal Injury Prevention Program evaluation is the measurement of injury incidence and severity. Before data collection begins, a definition including appropriate inclusion and exclusion criteria should be formed that denotes a reportable injury for a specific program evaluation. Not all injuries should be included in a program evaluation, but only the type of injury that your program is trying to reduce, such as musculoskeletal injuries related to SPHM. Studies in VHA reported data on injuries, usually strains, attributed to patient lifting/repositioning (Powell-Cope, et al., 2014 and Hodgson, Matz, & Nelson, 2013). Inclusion of other types of related injuries, including transport injuries that are not classified in the patient lifting/repositioning category, may require further review and may not be generalized across sites if definitions differ.

Although injury data is the metric of choice in measuring the success of SPHM Programs, users of these data must be familiar with challenges related to their

use. To begin with, patient handling injuries are either acute or cumulative trauma injuries. Although the far majority of these injuries are recorded as acute, most patient handling injuries are cumulative trauma in nature, with often unknown initial injury dates. A caregiver may be experiencing pain for months before reporting their injury; consequently, the actual date of injury initiation may not be recorded within the correct timeframe of injury. The injury may end up being captured during the post-implementation time period or a subsequent quarter/year.

Another confounding factor is that it is not uncommon for injury reporting to increase when staff members are educated on safe patient handling risks and understand that their minor aches and pains may lead to greater injury; thus, the reporting of injuries may increase even when the actual incidence of injuries is decreasing.

As significant as injury data reports appear for patient caregivers, many musculoskeletal patient-handling injuries are not reported by staff (Occupational Health & Safety Agency for Healthcare, 2006). Some researchers found that at least 50 percent were not reported (Siddharthan, K., Hodgson, M., Rosenberg, D., Haiduven, D., & Nelson, A., 2006).

Because of this, we are not aware of the true extent of caregiver injury or the consequences for patient care. Because nurses often work when injured, their risk of further injury is increased, and in turn, the likelihood of their having to take leave or retire because of injuries.

Capturing the severity of patient handling injuries assists in overcoming these issues. Severity indicators are total number of lost time days for all irrelevant injuries, number of lost time injuries, total number of modified duty days for all relevant injuries, and number of modified duty injuries.

Data collected on patient handling injuries would ideally include:

- A description of the incident, including the task being performed (lateral transfer from bed to stretcher or repositioning in bed), the action being performed (pulling patient onto stretcher or lifting patient to insert sling), patient factors related to the injury (obesity, sudden fall), and environmental factors that may have impacted circumstances surrounding the injury (clutter, obstruction of view).
- Whether the correct equipment was available, operable, and used.
- Whether an appropriate patient assessment/scoring method was utilized.
- Time/shift and date of incident.
- Clinical area/unit; location on clinical area/unit where incident occurred.
- Body part affected (primary and secondary).

- Number of days of lost work.
- Number of days on modified (light or restricted) duty.
- Number of personal sick and/or annual/vacation days taken as a result of the injury.
- Information on employee injured (position, number of hours normally worked).
- Staffing variance or staffing level.
- Whether the person injured had been trained or demonstrated competency on equipment usage.
- Medical care received as a result of the injury both within the hospital and outside of the hospital.

This type of data may be located in several databases within one facility, incompletely recorded, not recorded at all, or unavailable because of patient privacy requirements. When comparing results, it is important to evaluate the comparability of the data between sites, years, and sources. Utilizing data from the same source is critical. Previous years' data may not include unit information or other details. While there are several methods available for collecting data of this nature, such as retrospective review of incident reports, OSHA logs, interviews with nurse managers, and prospective independent data collection, some have merits above and beyond the others. For example, past incident reports may not include critical information about staffing levels, whether equipment was being used, and other contributing factors. Also, minor differences may exist between and within Veterans Integrated Service Networks (VISNs) as to how this data is recorded and stored. Below is a review of the databases that should hold such data, the limitations of each, and other possible ways to capture specifics of injuries.

The ASISTS package stores data on incidents (injuries and illnesses) that are reported within VHA. The following valuable data points are stored in ASISTS: personnel status (employee or volunteer), name of person involved, date and time of injury/incident, type of incident (assault, needle stick, etc.), supervisor, general setting of incident, location of injury, brief description of incident, characterization of injury, body part most affected, additional body part affected, side of body, status of duty returned to (full or light), lost and restricted time, and corrective action taken. Some facilities limit FC access to personal information, for example, by giving them access to the Union menu or giving them de-identified data. A challenge in the use of ASISTS is that the information is not automatically updated when an injured person's lost time and modified duty days change in relation to their injury. Additionally, there is also much variation in what information is included in the incident description, oftentimes limiting the full understanding of the incident. Finally, facilities vary in what they include under

the ‘patient lifting/repositioning’ category. Some facilities include incidents when a staff member is struck while transporting a patient or a patient strikes an employee while performing patient handling, and some do not. For these reasons, comparisons between facilities within the VA can be problematic. However, if the data collected and coded within a facility/VISN remains the same over time, confidence in facility and possibly VISN injury trends should be acceptable.

In order to get more accurate data on lost and restricted time, use of the OSHA 300 log is suggested. The OSHA 300 log is a federally mandated record of work-related injuries or illnesses. OSHA defines reportable criteria, and not all injuries are reported on the OSHA 300 log. The definition of a recordable injury has changed, meaning that the contents of the OSHA 300 log may not be comparable between years. Consult your safety manager for details on the changes and when they were made. And, as noted previously, capturing extended lost time and modified duty days is problematic and may impact the validity of data within the OSHA 300 log, as the log is generated from ASISTS data.

Verifying injury data collected using the ASISTS package with the OSHA log is an appropriate way to verify lost time and restricted time. The only method to generate accurate numbers of lost time and modified duty days is through the review of worker’s compensation data. Staff must manually count lost time and modified duty days found on individual claim forms. This can be a long and arduous task.

For the calculation of injury rates, many different sources of denominator data can be used; for example, number of assigned full-time employee equivalents (FTEE) to a unit can be collected from a Human Resource Department, or productive hours worked may be available from online databases. Bed days of care (BDOC) may be a valuable denominator for inpatient units. In addition, various standard injury rate statistics exist to aid in summarizing injury data. These are summarized in Enclosure 11-1, Standard Injury Rate Statistics.

VHA Directive 2010-032, Safe Patient Handling Program and Facility Design, requires facilities to supply the SPHM FCs with enough injury information to conduct investigations. FCs without direct access to ASISTS should ask Safety or Workers’ Compensation to provide patient handling injury information as incidents occur. Timely information aids in obtaining the most accurate, detailed investigation. The information acquired can be used to prevent similar injuries in the future.

Lastly, a comprehensive injury data collection tool can be developed to collect all of the items needed directly from the injured person or supervisor. This may save time and be more efficient than using multiple databases. Collection into a spreadsheet, such as Enclosure 11-2, Injury Data Collection Tool, can allow easy sorting and processing.

11.4.2. Musculoskeletal Pain/Discomfort

A decrease in pain and discomfort of direct care providers is essential in evaluating program success. Components of pain that may be of interest are: the intensity of the pain, the location of the pain, the length of time the pain was felt, and the consequences of pain, such as decreased quality of life and functioning and lost time from work. Assessment of pain should be simple, quick, valid, and reliable. It should include as many components as desired that relate to information gathering objectives. The Cornell Musculoskeletal Discomfort Questionnaire (Hedge, Morimoto, & McCrobie, 1999) was used to measure discomfort during the initial VHA research study (Nelson et al., 2006). Other researchers utilize the Nordic Musculoskeletal Questionnaire (NMQ). The NMQ was developed from a project funded by the Nordic Council of Ministers in order to test a standardized questionnaire methodology allowing comparison of low back, neck, shoulder, and general complaints for use in epidemiological studies (Crawford, 2007).

11.4.3. Job Satisfaction

Several studies have shown that job satisfaction can discriminate between injured and non-injured nurses and that low perceived control and lack of social support are correlated with having a musculoskeletal injury (Powell-Cope, et al., 2014). Examining job satisfaction in conjunction with other outcomes begins to show a full picture of the impact of the program. Immediate changes in outcomes, such as injury incidence, may not be apparent early in a program evaluation. A change in an outcome, such as job satisfaction, may be an important first step in decreasing injuries.

Job satisfaction is a complex outcome, derived from attitudes and perceptions of various elements of work, such as degree of enjoyment, perceptions of the work environment, reward system, autonomy, and professional status (Shader, K., Broome, M.E., Broome, C.D., West, M.E., & Nash, M., 2001). Job satisfaction is comprised of both intrinsic factors (such as personal achievement or sense of accomplishment) and extrinsic factors (such as pay and benefits or working conditions). As with the measurement of musculoskeletal pain/discomfort, many tools exist that evaluate job satisfaction; choosing the correct tool for a study involves thoroughly examining the previously published tools and desired inclusion data. Although focusing on registered nurses (RNs), the VHA study satisfactorily utilized the Index of Worker Satisfaction (IWS) (Nelson, et al., 2006) to measure not only RNs, but all levels of nursing caregivers. The tool included outcomes for total satisfaction, feelings of professionalism, degree of effort required by their job, and others.

Research identifies that job satisfaction is directly linked to employee retention, recruitment, and decreased turnover rates. Additionally, RN satisfaction aids in improved patient outcomes (Moorer O.W., Meterko, M., Alt-White A., Sullivan J.L., 2010). A Strategic Decision Analysis Group with Stanford Hospital and Clinics quantified the value of lowering turnover by calculating the reduction in training

costs for new staff. They determined the average cost of $60,000 to recruit and train a new nurse (Celona, J., Driver, J., Hall, E., 2010).

11.4.4. Acceptance/Adherence

Frontline staff buy-in has been proven essential for program success. Scientific evidence and collected facility data indicating a decrease in musculoskeletal injuries as a result of program implementation can be used as a means of staff acceptance and sustainability. Measurement of staff acceptance can be performed through the use of surveys, monitoring logs, focus groups, tracking device systems to report lift usage, and visual monitoring in all areas. It is important to incorporate staff into the decision process when identifying program components, such as equipment, ways to organize equipment rooms, process development, etc. Such empowerment fosters program ownership. Time invested in listening to staff concerns, barriers, and successes as well as providing timely feedback leads to group cohesiveness and builds trust. ANA (2013) recommends that health care workers, as stakeholders, are encouraged to assist with the SPHM data collection. The health care recipient, health care worker, and employer are essential components in the collection and management of evidence as a way of implementing a comprehensive evaluation system that drives the sustainability of SPHM Programs long-term and can lead to a return on investment (Gallagher, 2013).

For a program to be successful, it must appeal to multiple stakeholders. It may be worthwhile to measure acceptance and adherence among management, physicians, and auxiliary services on which the program relies as well as front line caregivers.

Examining how patients and family members view the program is also a measurable outcome. Desired positive outcomes include patients describing increased sense of dignity, comfort, and security with the use of safe patient handling techniques and equipment.

11.4.5. Program Components

Multiple program elements have been identified as successful indicators in program development and sustainability. During the VHA Program roll-out, implementation milestones were measured to determine how fully the program had been implemented (Powell-Cope, et al., 2014):

- Percent deployment of ceiling lifts and other SPHM technologies (where 100 percent met all identified needs or the VHA coverage/space recommendations).
- UPL effectiveness as rated by the SPHM FC.
- Competency assessment in the use of SPHM technology.
- Whether the FC was linked with the safety committee.

- UPL training.
- Achievement of milestones associated with initial program implementation.
- Program support from key stakeholders.
- Use of equipment fairs to help staff choose equipment they need.
- Incorporation of SPHM into new employee orientation.

The process of measuring program elements/components to which staff adhere, determining barriers, and working towards removing barriers is necessary to sustain an SPHM Program. If the program is showing positive outcomes, and employees are not adhering to the program components, the evaluator cannot be sure of the reasons behind the outcomes. Also, if multiple components make up a single program, some pieces of the program may be working better than others. Some components may need to be adjusted. A tool can be developed and used to help track and measure adherence to the components of a particular program.

One method of measuring appropriate use of equipment and program adherence is to observe patient handling events and record how often appropriate methods or equipment were used. An example form is included as Enclosure 11-3, Patient Handling Equipment Use Status Walk-Through Checklist. Changes in patient population or mobility will affect this measure. It is important to recognize when staff members are choosing manual patient handling as an alternative to equipment use. In addition to the use of the surveys, UPL logs, such as Enclosure 11-4, Safe Patient Handling Unit Peer Leader Activity and Program Status Log, address such issues as use and acceptance of the algorithms, use and acceptance of the After-Action/Safety Huddle review process, and detailed examination of the activities of the UPLs. In conjunction with the periodic logs and survey tool, focus groups can be performed with caregivers and administrators.

11.5. Cost Benefit Analysis of SPHM Technology

A suggested place to begin measuring the benefits of technology is through use of Cost Benefit Analyses (CBA). A CBA utilizes monetary dimensions to evaluate all associated costs and savings that may be generated as a result of technology implementation. The outcome of the analysis can be used to guide decisions and obtain buy-in from administration and financial investors when benefits exceed costs (Lempert, R.J., 2004).

Some of the costs and associated outcomes that can be included in the CBA are summarized as follows:

1. Direct costs of installing and operating lifting devices:
    - Ceiling lifts, installation/construction

- Other SPHM equipment
- Maintenance of equipment, including preventative
- Slings and disposable supplies
- Lift replacements, considering life span of all equipment and accessories
- Training hours
- Salary of SPHM FC and other SPHM Program-salaried staff

2. Staff Benefits:
    - Decreased musculoskeletal injury rates associated with patient handling
    - Decreased modified duty cases associated with patient handling
    - Decreased lost time cases associated with patient handling
    - Decreased workers' compensation costs associated with patient handling
    - Decrease in staff absenteeism
    - Decrease in back/neck/shoulder pain/fatigue in caregivers
    - Increased job satisfaction, decreased turnover
3. Patient Benefits:
    - Decrease in patient injuries during mobility (Ota, H., Kawait, H., Sato, M., Ito, K., Fujishima, S., & Suzuki, H., 2015)
    - Decrease in pressure ulcers (Gallagher, S., 2013)
    - Decreased length of patient stay (Ntoumenopoulos, 2015)
    - Decrease fall rate
    - Increased dignity, security, satisfaction with mobility

When presenting outcomes, anticipate questions about other factors affecting the same outcomes.

The net outcome effect of the intervention is the total change (reduction) in costs due to the introduction of technology at the intervention site. If there is a control site that was similar but unaffected by a specific intervention, it may be possible to adjust for other factors experienced by both sites. The ratio of the direct costs

divided by the net outcome effect provides us with the cost-per-dollar of savings achieved through the incorporation of the SPHM Program to prevent injury.

Note: If the evaluation is to be completed over several years, the annual inflation rate of medical care and wages may need to be considered in the analysis. For example, a medical procedure that cost $100 in 2007 may cost $150 in 2010.

11.6. Intangible Indicators

Intangible benefits of SPHM Programs may not be easily quantifiable, but anecdotal reports may help support the program. These may include morale and recruitment and retention of employees. Ties to the organization's mission and values can help to defend the worth of the program.

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11.8. Enclosures

11-1 Standard Injury Rate Statistics

11-2 Injury Data Collection Tool

Enclosures

Enclosures can only be printed by accessing links online.

3-1 Patient Care Incident/Injury Data Collection Tool

3-2 Tool for Prioritizing High-Risk Patient Handling Tasks

3-3 Patient Care Ergonomic Evaluation Staff Interview Tool

3-4 Pre-Site Visit Clinical Unit/Area Profile

3-5 Existing Equipment/Condition/Use

3-6 Patient Care Ergonomic Evaluation Report

4-1 Product Evaluation Tool

4-2 Product Surveys

4-3 Patient Handling Equipment Fairs

5-1 Assessment Criteria and Care Plan for Safe Patient Handling and Movement

5-2 Safe Patient Handling and Mobility Patient Assessment/Care Plan

5-3 VHA Safe Patient Handling and Mobility Algorithms

5-4 Association of periOperative Registered Nurses (AORN) Ergonomic Tools

5-5 How to Obtain a Safe Patient Handling Score

5-6 Safe Patient Handling - Patient Mobility Tool

6-1 Sample Position Description, Program Manager

6-2 Sample Performance Standards, Program Coordinator – Safe Patient Handling and Movement (SPHM), Physical Therapist

6-3 Sample Functional Statement, Safe Patient Handling Facility Coordinator, Registered Nurse: Nurse III

6-4 Safe Patient Handling and Mobility National Program Manager Duties

7-1 Safe Patient Handling and Mobility (SPHM) Unit Peer Leader Expected Roles and Responsibilities

7-2 Unit Peer Leader Monthly Process Log

9-1 Veterans Health Administration (VHA) Safe Patient Handling and Mobility (SPHM) Training and Education Strategic Plan