

Safe Patient Handling and Mobility (SPHM) Education in Health Care Student Curriculum

A White Paper

- Why is SPHM needed?
- What is the status of SPHM curriculum in the United States?
- How can faculty implement evidence-based SPHM practices in curriculum to prevent student injury and promote a culture of safety for patients and health care workers?



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Executive Summary

Manually assisting patients to move who have limited mobility puts both health care workers (HCWs) and patients at high risk of injury. Performing manual patient handling tasks that involve repeated pushing, pulling, lifting, and holding, as well as awkward and sustained postures, are the primary reason HCWs consistently rank in the top five industries most likely to be injured at work. Nurses, aides, and allied health professionals such as physical and occupational therapists, emergency medical technicians, and radiation technologists suffer the highest rates of injuries associated with manual patient handling.

These injuries carry a high cost to the HCWs who are often forced to change their practice setting, careers, or leave the workforce due to injury. Patients also suffer from missed care due to the impact of HCW injuries on staffing. Health care facilities are affected by high workers' compensation costs and difficulty hiring and retaining an adequate workforce to care for their patients.

Reliance on outdated and disproven evidence that 'proper body mechanics' can prevent injuries when manually handling patients continues to place HCWs and their patients at unacceptable risk. Body mechanics, while important, do not prevent injuries; forces incurred during manual patient handling exceed the tolerance of the human body, even when proper body mechanics are employed.

Safe Patient Handling and Mobility (SPHM) programs have been shown to decrease HCW injuries associated with patient handling tasks, and they improve patient safety by reducing skin tears, pressure injuries, and falls. SPHM programs also improve patient dignity and comfort during transfers, increase mobilization of patients, and improve functional outcomes.

There is growing global recognition that healthy and safe HCWs are more likely to provide care that leads to optimized patient health and safety. However, despite extensive evidence on the benefits of SPHM programs, integration of SPHM into a culture of worker *and* patient safety has not been widely adopted in routine clinical practice across the health care continuum in the United States (US).

Health care workers and students have the right to be protected from musculoskeletal injuries just as they are offered personal protective equipment (PPE) to prevent transmission of infectious pathogens.

Health care education programs could and should play a critical role in driving this culture change in health care, equipping students with the knowledge and skills to ensure their health and safety and maximize the well-being of their patients.

Equally, health care organizations with SPHM programs can assist to integrate SPHM in health care education programs through partnership activities that include providing SPHM education and training to students and faculty and reinforcing SPHM principles during clinical placements.

The National Institute for Occupational Safety and Health (NIOSH), together with the American Nurses Association (ANA) and the Veterans Health Administration (VHA), have made an extensive effort to

develop and disseminate evidence-based SPHM curriculum in schools of nursing throughout the US. However, few college-level nursing and allied health programs have integrated SPHM into standard curriculum.

Without exposure to SPHM techniques and training, students are at greater risk for injury during their clinical internships. Some are injured before they even graduate. Maybe most importantly, students are graduating without the vital, evidence-based knowledge that will help keep them and their patients safer.

Faculty have an obligation to teach to ethical principles and evidence-based standards of practices as set forth by associations and accreditation entities that support health care professionals. Teaching current evidence-based SPHM principles in student curriculum would meet the intent health care standards of practice.

Until SPHM principles are consistently taught as the *gold standard* for how to safely move and mobilize patients in preparatory programs, HCWs and students will continue to incur preventable injuries at unacceptable rates, and unsafe lifting and moving practices will ensue.

Based on an extensive literature review, this paper discusses why SPHM is not widely integrated in health care student curriculum in the US and proposes solutions to improve integration of SPHM into all health care student curricula.

The purpose of this white paper is to:

- Describe why SPHM is needed in health care student curriculum.
- Identify the current state of SPHM within health care student curriculum.
- Identify gaps and barriers to comprehensive and consistent curriculum content adoption.
- Determine the desired future state of SPHM within health care student curriculum and the steps to achieve this state.
- Provide a foundation for development of recommended SPHM curriculum for all health care student education programs in the US.
- Provide recommendations for academic programs and faculty to better prepare students to practice in their profession safely and without injury to themselves or to their patients.

Introduction

About The Association of Safe Patient Handling Professionals, Inc. (ASPHP)

The Association of Safe Patient Handling Professionals, Inc. (ASPHP) was formed in 2011 as a non-profit corporation by a group of industry experts to provide a collaborative connection among individuals interested in the science of safe patient handling and mobility (SPHM). ASPHP's mission is to advance the science and practice of SPHM by empowering caregivers and their patients to maximize their well-being and quality of life. This mission is achieved by offering opportunities to share experiences, gain knowledge through education, and access the most up-to-date information. The members of ASPHP work together with affiliate Certified Safe Patient Handling Professionals™ (CSPHP) to build a credentialed profession dedicated to the safety and comfort of caregivers and their patients worldwide. The work to accomplish the mission and vision of the association is conducted through a number of committees and is led by a board of volunteers with extensive knowledge and education in SPHM. ASPHP's Education Committee is responsible for developing and delivering educational content for ASPHP members and the public.

The **SPHM Curriculum Task Force** is a subcommittee of the Education Committee. The objectives of the task force are to facilitate integration of SPHM into health care student education programs in the United States (US).

This white paper was developed after an extensive literature review that was conducted by the Curriculum Task Force, together with input from task force members' colleagues who currently teach SPHM in schools of nursing, physical therapy, and other health care disciplines.

The goals of this paper are to:

- Describe why SPHM is needed in health care student curriculum.
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- Provide recommendations for academic programs and faculty to better prepare students to practice in their profession safely and without injury to themselves or to their patients.

Background

Defining the Problem

Injury Rates Associated with Manual Patient Handling

Musculoskeletal disorders are defined as soft-tissue injuries or disorders of one or more of the following: muscles, nerves, tendons, joints, cartilage, or spinal discs. Work-related musculoskeletal disorders (WMSDs) are conditions in which:

- The work environment and performance of work contribute significantly to the condition; and/or
- The condition is made worse or persists longer due to work conditions.¹

WMSDs are a leading occupational injury to workers across the health care continuum in the US. Health care workers (HCWs) suffer high rates of WMSDs as a result of overexertion when performing manual transferring, repositioning, lifting, and mobilization of patients.² In fact, HCWs suffer a higher rate of WMSDs involving days away from work than workers in many other industries including the manufacturing, construction, and agricultural sectors.³⁻⁶ (Figure 1)

Back and shoulder injuries persist as the most frequent and costly WMSDs for nurses, aides, and allied health professionals such as physical and occupational therapists.⁷

There is evidence to indicate that the annual prevalence of low back pain in nurses has a mean of 50%, and the lifetime prevalence ranges from 35% to 90%. Recurrence rates of low back pain in nurses exceed 70%.^{6,8,9}

In the 2018–2019 Healthy Nurse Healthy Nation® (HNNH) survey conducted by the American Nurses Association (ANA), 58% of nurse respondents indicated they had experienced musculoskeletal pain at work during the past year.¹⁰ In the 2019–2020 HNNH survey, 42% of nurse respondents considered that lifting and repositioning heavy objects, including patients, created a significant level of risk for occupational injuries.¹¹

Nursing aides (NAs) are reported to experience twice the injury rate of nurses related to patient handling.^{4,12} NAs incur WMSDs at more than *five times* the US national average and account for 8% of all work-related back injuries in the US.¹³

Allied health professionals such as physical therapists (PTs) and occupational therapists (OTs), emergency medical technicians and paramedics, radiology technicians, and home care and personal aides, also experience high rates of WMSDs associated with performing manual patient lifting, transferring, and mobilization tasks.^{12,14-26}

Note: Health care-related professions account for 25% of the injuries shown in Figure 1.

Figure 1.

The Top 20 Occupations with the Highest Number of Nonfatal Occupational Strain, Sprain, and Tear Injuries Involving Days Away from Work in Private Industry 2020²⁷

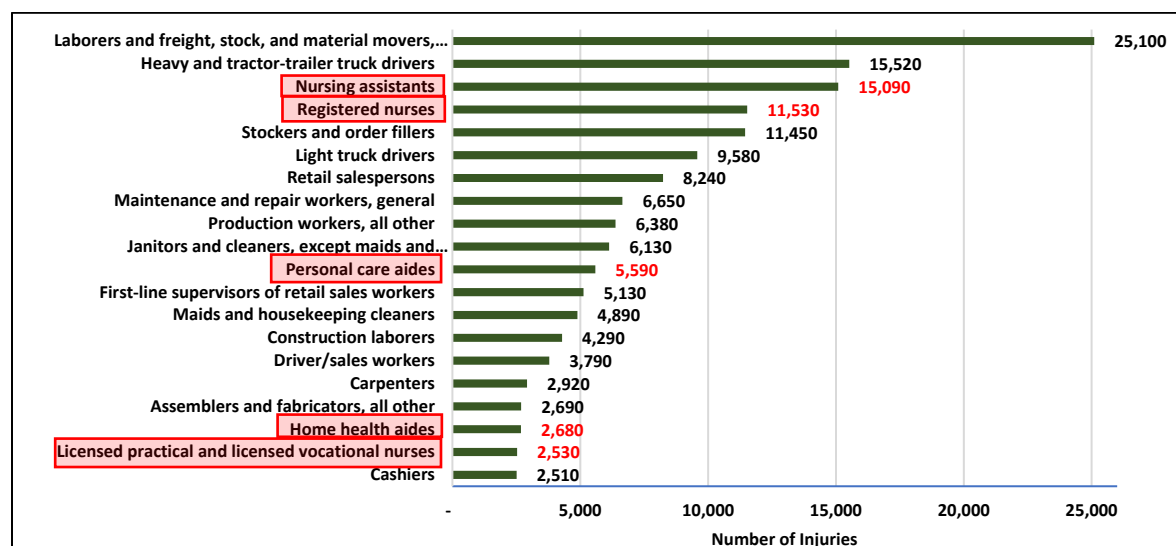


Figure 2 shows the rate of overexertion injuries with days away from work by health care occupation that occurred due to tasks that involve lifting and lowering. Given the primary function of these health care occupations is to provide direct patient care, it is likely that these lifting- and lowering-related injuries are mostly associated with tasks involving patient handling.

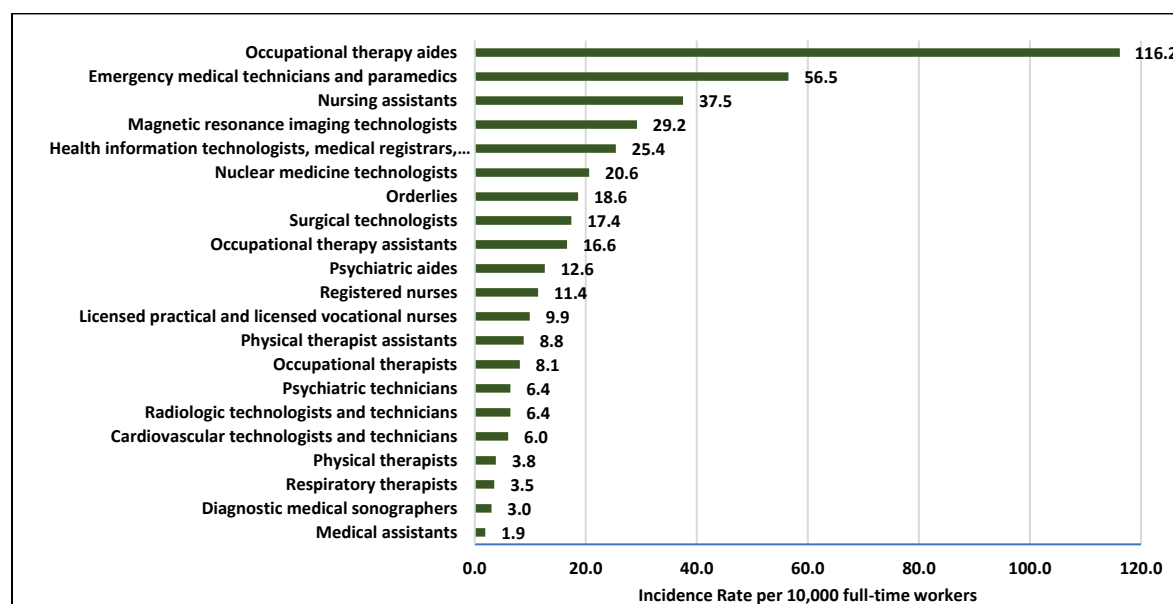
Evidence suggests that PTs and OTs experience an annual incidence of WMSDs of 20.7%, and an annual prevalence for WMSDs of 27% or greater.^{18,28} Activities such as lifting, handling, and transferring patients when performing rehabilitative interventions are believed to contribute to increased risk of WMSDs in PTs and OTs.^{15,17-19}

Radiology technicians also suffer from significant rates of WMSDs associated with tasks such as manually transferring patients on a spine board to and from a radiographic table, manually lifting patients to and from a wheelchair, and repositioning patients.²¹

As discussed later in this paper, health care students performing patient care tasks during clinical rotation also experience WMSDs due to manual patient handling.

Figure 2.

Incidence Rates for Nonfatal Occupational Injuries and Illnesses Involving Days Away from Work Due to Overexertion in Lifting and Lowering Events per 10,000 Full-Time Workers in Private Healthcare Occupations, 2020²⁹



Why is Manual Patient Handling So Hazardous?

Manual patient handling tasks require HCWs to exert excessive force when lifting, pushing, and pulling, and to work in extreme awkward postures such as bending forward for long durations, lateral bending, and twisting of the trunk and reaching. (Figures 3 and 4)

Studies have shown that tasks such as manually repositioning a patient in bed and transferring a patient between bed, chair, and commode create high compressive and shearing forces, or spinal loading, which significantly increase the risk of low back injuries.³⁰⁻³⁴ (Figure 5)

Sudden, unexpected, forceful exertion, e.g., when patients move unpredictably during a handling task, further increases the loading on the spine.³⁵

Figure 3.

*Primary Risk Factors that
Can Contribute to the
Development of WMSDs
Associated with Manual
Patient Handling*

*Source: L. Enos, HumanFit, LLC.
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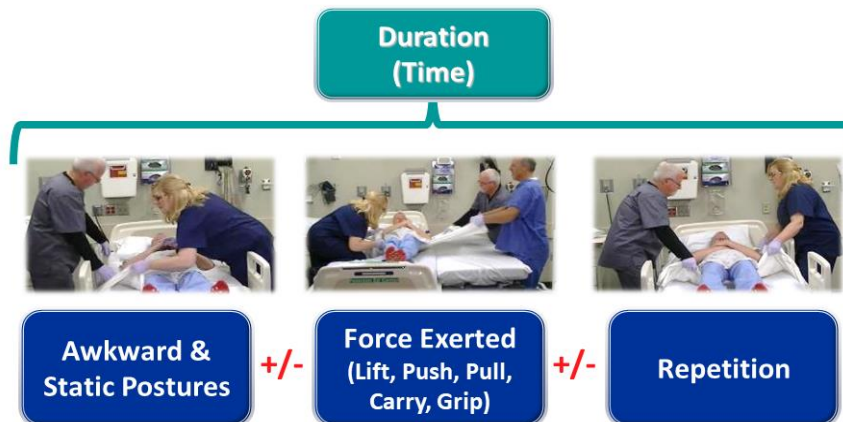








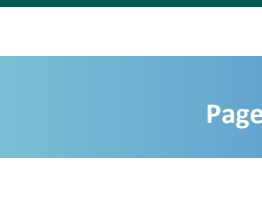


Figure 4.

High Risk Manual Patient Handling Tasks - as Supported by Research ^{36,41-43}

Source: L. Enos, HumanFit, LLC. Reproduced with permission

<ul style="list-style-type: none"> • Repositioning in bed e.g., turning and boosting a patient; raising a patient from lying to sitting in bed or at edge of bed; positioning or removing a bedpan 		<ul style="list-style-type: none"> • Standing transfers e.g., to/from bed to commode/chair/exam table 	
<ul style="list-style-type: none"> • Seated transfers e.g., to/from bed to chair, commode, wheelchair; chair to chair; wheelchair to exam table or vehicle 		<ul style="list-style-type: none"> • Repositioning in wheelchair, chair 	
<ul style="list-style-type: none"> • Supine transfers e.g., to/from bed, stretcher, or procedure table 		<ul style="list-style-type: none"> • Positioning an individual of size to access the abdominal or perineal area 	
<ul style="list-style-type: none"> • Lifting and holding of extremities 		<ul style="list-style-type: none"> • Toileting • Showering and bathing • Ambulation • Floor/fall recovery 	
		<ul style="list-style-type: none"> • Transporting a patient in a bed, stretcher, or wheelchair 	

The level of exertion needed to complete a manual patient handling task *increases* in magnitude if the patient is fearful, unable or unwilling to assist, and/or weaker or heavier. Other factors that increase the needed level of exertion include if: the transfer distance is greater; workspace is restricted; the transfer is hurried; furniture and equipment lack adjustability; and/or there are not enough staff to assist. Thus, the risk of WMSDs increases significantly when these factors are present.³⁶⁻⁴⁰

HCWs who perform manual patient handling tasks are typically exposed to these physical risk factors repeatedly during a work shift and for extended duration, e.g., shift after shift.

As the spine is exposed to the high loads created by manual patient handling over time, the tolerance limit of the spine and surrounding soft tissues is decreased. (Figure 6)

This cumulative exposure to manual patient handling tasks not only leads to injuries of the muscles, tendons, and ligaments, but to cumulative microfractures of the lower vertebrae which can lead to lumbar disc damage and permanent disabling injury.⁴⁴⁻⁴⁶

Figure 6.

*Decreasing Tolerance to Cumulative Loading of the Spine*³¹

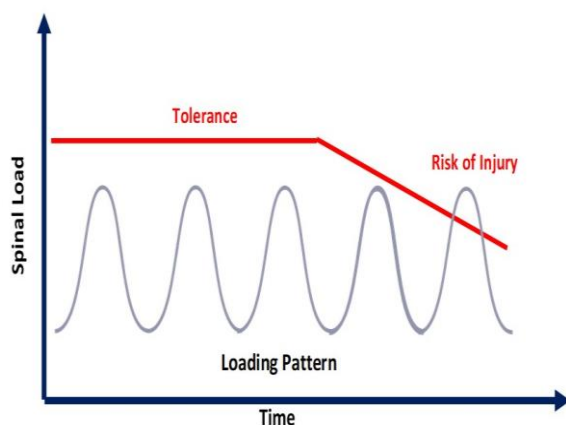
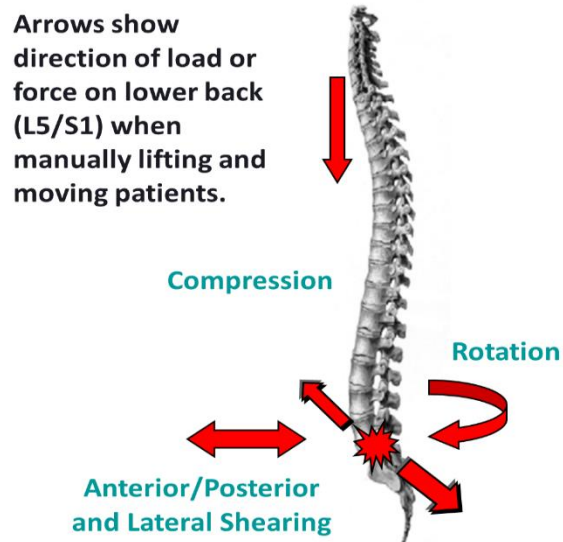


Figure 5.

The Direction of Forces on the Spine when Manually Lifting Patients



Another factor that influences the effects of cumulative spine loading and the amount of micro damage or risk of low back pain is insufficient recovery or rest time from exposure to the physical risk factors that HCWs are exposed to within the task being performed.⁴⁷

Long and unpredictable work hours and the absence of work breaks are considered a 'norm' for many HCWs who provide direct patient care. These work organization-related factors compound the exposure to physical risk factors and increase the likelihood of low back injury.^{37,48-50}

Unfortunately, damage to the spine and intervertebral discs can be occurring for weeks, months, or years, and HCWs may not realize this

until one event causes low back pain due to the final overloading of the spine and supporting structures.⁵¹

Once low back injury has occurred, there is a greater risk of reinjury.^{44, 47}

The increasing emphasis on the early and frequent mobilization of patients to decrease the serious complications of immobility may also increase the physical job demands for nurses, nursing aides, and rehabilitation professionals. This occurs when mobilization activities such as pivot transfers and ambulation are performed manually rather than using SPHM technologies such as powered patient lifts. This is particularly important for patients with weight-bearing precautions.

Physical risk factors that contribute to the development of WMSDs – force, repetition, awkward postures, and duration – also occur in non-patient handling tasks performed by HCWs. Some of these tasks include carrying linen bags, moving and handling medical equipment, and pushing patients in wheelchairs or on stretchers.

Causation of WMSDs, and especially low back pain, is multifactorial in nature. Non-physical risk factors can also play a role in development of these disorders. For example, staffing levels perceived as inadequate by HCWs may be associated with higher prevalence of back pain together with psychosocial risk factors that have been associated with an increased likelihood of WMSDs. These include insufficient sleep due to fatigue and high psychosocial demands such as low social support, reduced job control, and a hostile work environment.^{41,52- 56}

In addition, there are some individual factors, as well as exposure to non-work-related physical risk factors, that may also contribute to WMSDs.^{47,57}

However, research shows that the cumulative physical demands of manual handling and lifting of patients who cannot move themselves independently play the most significant role in development of low back pain and injury.^{4,49,54}

The excessive biomechanical and postural stress required to repeatedly lift and move patients manually creates a significantly elevated risk of injury for HCWs. The loads are too great for body mechanics to make a difference.^{30,51,58}

Thus, there is no safe method to manually handle patients or manually assist with patient mobilization.

More than 35 years of research have consistently shown that training HCWs to use ‘proper’ body mechanics and manual lifting techniques has failed to prevent and reduce WMSDs associated with patient handling tasks.^{36,59}

Figure 7 illustrates how much patient weight an HCW may be able to lift manually.

Figure 7.

How Much Patient Weight Can an HCW Lift Manually?

As previously discussed, research shows that manual repositioning, lifting, and transferring of patients results in large spine loads that exceed the maximum recommended compression and shear tolerances of the spine. (Figure 5)

The amount of force exerted by an HCW during a shift when manually repositioning, lifting, and transferring a patient is also dependent on several factors. These include the size, shape, and weight of the patient, how much the patient can physically assist with the task and follow instructions, the degree of flexion and/or rotation of the HCW's spine, the distance of the HCW from the patient, the frequency that the task is performed, the anthropometrics of the HCW, and how many HCWs are performing the task.^{36-40,65-68}

One way to illustrate how much force an HCW will exert during a shift when manually handling patients is to examine patient handling tasks completed by nurses and aides in terms of patient weight handled. In the acute care setting, repositioning a patient in bed is one of the most frequently performed tasks that is also a leading cause of low back injuries.^{33,69,70}

Poole Wilson et al., observed nurses in three ICUs repositioning patients an average of 35 times during a 12-hour shift. Repositioning tasks were defined as boosting and turning in bed, repositioning extremities, and repositioning patient laterally.

The *average* number for each task per 12-hour shift was seven times of turning patient on side, eight times of repositioning patient up in bed, 19 times of repositioning extremities, and one time of repositioning patient laterally.⁷¹



The force required to logroll (i.e., the HCW reaches over a patient and turns the patient toward them) a patient who cannot assist to turn in bed is estimated to be approximately 32% of the patient's weight.⁷² The average weight of US adult men and women combined is 180 lbs.⁷³

Based on the above data, an HCW who turns patients with an average weight of 180 lbs for a total of seven times in a shift would 'handle' about **400 lbs** of patient weight.



What weighs 400 lbs?

An adult male silverback gorilla!

The leg of a patient with average weight of 180 lbs weighs approximately 31.5 lbs.^{74,75} Thus, repositioning extremities alone could add up to handling several hundred pounds in a 12-hour shift!

There is evidence to support the forces required to *boost* a patient in bed using a cotton sheet or drawsheet are *greater* than those required for turning the patient and *far exceed* the safe force

limits for the spine.^{33,67,76}



However, there is no data on the force exerted as percent of patient weight when pulling or dragging the patient.

Given the many other manual patient handling and *materials* handling tasks that a nurse or aide may perform in a shift, it is not hard to extrapolate that they could handle the equivalent of hundreds of pounds of patient weight.

So, is there a safe lift limit for manually lifting patients?

Research demonstrates that the maximum weight a caregiver should manually lift is 35 lbs, but only if the task is performed under ideal conditions including if the:

- Patient is cooperative.
- Patient is kept close to the HCW's body.
- Lift is smooth and slow.
- HCW does not have to twist.
- Shift worked is no longer than eight hours.⁴⁵

In reality, very few lifting tasks would meet these safety criteria, and few patients weigh less than 35 lbs!

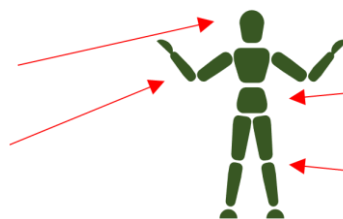
35 lbs is approximately the weight of a typical computer task chair!



How much does each body segment weigh (approximately) on a patient weighing 200 lbs?^{74,75}

Head – 8% = 16 lbs

One Arm – 5.3% = 10.6 lbs



Whole Trunk – 54% = 108 lbs

One Leg - 17.5% = 35 lbs

Single person manual patient transfers have been shown to consistently exceed the loading tolerance of the spine. However, research shows that when two or more HCWs manually lift a patient together, the lift is uneven because of the differences in height and strength between HCWs performing the task. This uncoordinated movement and resultant postures create higher shear forces in the lower spine. Biomechanical tolerance to shear force is much lower than tolerance to compressive force, thus creating a higher risk for back injury.^{31,60}

So, having more HCWs manually lift a patient does not necessarily reduce the risk of WMSDs.

Another traditional solution that is thought to reduce the risk of back injury when standing and transferring patients is the use of gait belts, i.e., a straight belt made of fabric or plastic with no handles which is placed around the patient's abdomen. Gait belts are also often promoted as a tool to control patient descent to the ground during a fall. However, gait belts have not been shown to reduce loads on the spine sufficiently to decrease the risk of injury when performing these tasks.^{31,61-64}

Thus, gait belts should not be used as devices to lift patients. They are intended for guidance, feedback, and steadying assist when standing and ambulating patients who can bear their own weight and have some degree of locomotion.

Research supports that the most effective approach to minimize the large external loads on the spine that occur during patient handling tasks is to use mechanical lifting devices as part of a multifaceted safe patient handling and mobility program.

The Cost of WMSDs Related to Manual Patient Handling

The economic, physical, psychological, and social costs of WMSDs for HCWs, health care organizations, and their patients are staggering.

WMSDs have a significant physical and psychological impact on the quality of life of injured HCWs. Examples include reduction in usual leisure or recreational abilities, short- and long-term ability to perform activities of daily living, frustration and anger related to the inability to practice their profession, and anxiety regarding future employment prospects.^{19,21,77}

WMSDs are associated with high costs to employers such as, absenteeism, burnout, higher employee turnover, reduced workforce efficiency, and the direct costs of increased health care, disability, and workers' compensation costs. The direct and indirect (hidden) costs of WMSDs are typically more severe than the average nonfatal occupational injury or illness.^{8,78}

In 2017, costs of overexertion-related injuries due to manual patient handling were \$1.66 billion and accounted for 30.01% of the direct costs of all workers' compensation claims with more than five days away from work in the US health care industry.⁷⁹

Indirect costs related to WMSDs, such as the costs related to replacing an injured worker either temporarily or permanently, are estimated to be 2.5-4 times the direct cost of injury, depending on the severity.⁸⁰ The cost of replacing a single nurse can range from \$11,000 to \$103,000.^{9, 81-83}

Evidence shows that between 12%-25% of nurses and rehabilitation professionals with WMSDs request transfer away from providing bedside or client care or choose to leave the profession because of an injury or fear of an injury.^{7,9,78,84,85}

A 2014 study concluded that nearly one in five newly licensed registered nurses (RNs) leave their first nursing job within the first year, and one in three (33.5%) leave within two years.⁸⁶ Historically burnout is a leading cause of the high turnover rates in nursing. The COVID-19 pandemic has increased and added work-related stressors which have increased the likelihood of burnout in HCWs.⁸⁷⁻⁸⁹ Decreasing HCW burnout, fatigue, and turnover related to high physical workloads associated with patient care tasks is more important than ever.

Despite these alarming statistics, injury rates and reported workers' compensation costs represent a *fraction* of the full cost of WMSDs associated with manual patient handling. Research indicates that as many as 50% of WMSDs go unreported by HCWs.⁹⁰⁻⁹³ For example, one study found less than 10% of nursing home workers with prevalent lower back pain submitted a workers' compensation claim.⁹⁴

Further, WMSDs can have an indirect negative impact on the quality of care provided to patients. For example, there is some evidence to support the relationship between nurse injuries and physical discomfort and the impact on patient care.¹³ In a 2014 survey, 22% of nurses reported being less friendly or engaging with their patients due to physical discomfort, and 22% also modified or limited their activity/movement on the job.⁹⁵

Ambulation and repositioning of patients are two of the most frequently missed nursing care tasks in hospitals throughout the world. The physical challenges associated with manually repositioning and assisting patients to ambulate may partially explain why these activities are among the nursing tasks most frequently missed.⁹⁶ Barriers to ambulation of patients include the nurse's perception of risk to the patients, e.g., risk of patient fall, or risk of injury to themselves if they get the patient up to walk.⁹⁷

Patients who are more physically challenging to mobilize, e.g., are immobile with high body weight and mass, and/or who are confused and agitated, may not be moved as frequently as needed if manual handling is required.

Lastly, manual patient handling can be painful, increase the risk of skin tears and bruising, and be undignified for the patient.⁹⁸

Benefits of SPHM Programs

Evidence shows that multifaceted participatory safe patient handling and mobility programs (SPHM) can be effective in reducing HCW injuries associated with patient handling and can also be beneficial for patients.^{5,50,99-107}

At the core of these programs is the use of SPHM technology such as powered mobile mechanical patient lifts, ceiling-mounted lifts, and friction-reducing devices/lateral transfer aids to safely move patients when performing patient handling tasks that expose HCWs to the risk factors for WMSDs as described previously.

HCW Safety. The following is a summary of the outcomes reported as a result of implementation of comprehensive SPHM programs during the past 15 years in the US.^{36,50,80,100,102,103,105,108-119}

- 30%-95% decrease in the number and rates of WMSDs.
- 66%-100% decrease in severity or lost and restricted workday injury rates related to WMSDs.
- 30%-95% decrease in workers' compensation costs of WMSDs.

Increases in HCW job satisfaction and significant reductions in health care staff turnover are also reported. Initial investment for purchase of technology and implementing an SPHM program is reported to be recovered between two to four years.^{39, 85}

Violence by patients against HCWs has increased significantly over the past decade with serious and sometimes deadly consequences for workers.¹¹⁹ Use of SPHM technology such as ceiling and floor-based lifts reduces the time spent in close physical contact during a patient lift or transfer task that may agitate patients who are cognitively impaired. Consistent use of SPHM technology appears to reduce the risk of patient-initiated violence when patient care tasks are performed.¹¹⁹⁻¹²²

There is anecdotal evidence that the decrease in close physical contact with patients when using SPHM technology may also decrease the risk of body fluid exposure.

Patient Safety. It is more challenging to measure the relationship between SPHM and patient outcomes; however, there is a growing body of evidence to support that SPHM programs are beneficial to patients.

In a meta-analysis of studies that examined the association between HCW health and safety and patient outcomes, Gibson et al., reported several key findings to support the positive impact of SPHM programs that include the use of SPHM technology and policies on HCW musculoskeletal health and on patient outcomes. These include:

- Reduced risk of health-facility acquired pressure injury by up to 17%.

- Improved patient mobility by 12%.
- Improved patient comfort and safety.^{123,124}

A 43%-50% decrease in pressure injuries and significant reduction in patient falls related to lift and transfer activities have been reported by some hospitals and long-term care facilities when implementing an SPHM program.^{119,125-127}

Although there is need for more research to demonstrate the impact of specific SPHM related interventions on early mobility, it appears that the use of SPHM technology plays a key role in facilitating early and safe mobilization of patients.^{13,128,129}

There is evidence that the use of SPHM technology increases participation of patients in their therapeutic activities and does not have a negative impact on functional independence measure (FIM) mobility scores.^{18,130-134}

Case studies in long-term care have reported that residents experience an increase in physical functioning and activity level, lower levels of depression, improved urinary continence, lower fall risk, and higher levels of alertness during the day after SPHM programs were implemented.¹⁰¹

Effective SPHM Programs

Evidence indicates that effective sustainable SPHM programs should include the following elements.^{5,50,100,102,108,109,115-117,135-138}

- Visible ongoing leadership support.
- Active ongoing involvement of HCWs in all facets of the program.
- ‘No manual lifting’ policies.
- SPHM patient assessment protocols or decision-making algorithms.
- The use of SPHM technology to safely lift, move, reposition, and transport patients, and to reduce or eliminate the risk factors for WMSDs.
- Sufficient quantity of SPHM technology that are readily accessible, well maintained, and ‘fit’ the physical, cognitive, clinical, and rehabilitative needs of the patient population, the task to be performed, and physical design of the workspace.
- Defined processes for storage, cleaning, maintaining, and inspecting SPHM technology and slings with replacement plans based on lifespan of lifts, batteries, slings, etc.
- Facility champions (program coordinators).

- Unit-based peer leaders or SPHM coaches.
- Ongoing competency-based hands-on SPHM training.
- Annual evaluation of program performance.

Figure 8 summarizes laws, standards, and professional association guidance related to SPHM in the US.

Figure 8.

SPHM Laws, Standards, and Professional Association Guidance Related to SPHM in the US

SPHM Laws and Standards in the US

Federal Regulation

Health promotion for US workers in performance of their jobs is supported by workplace safety programs regulated by the Occupational Safety and Health Administration (OSHA). For most industries, such as construction, transportation, and manufacturing, OSHA regulations to address industry specific hazards are well established. To date, OSHA has developed specific regulation for the health care industry related to blood borne pathogen and needle stick exposures, and defined requirements for the use of personal protective equipment such as respirators. OSHA has developed guidelines for SPHM programs in acute and long-term care and implemented a national emphasis program focusing on WMSDs relating to patient handling. However, there have been three failed attempts since 2009 to pass federal SPHM legislation; thus, there is no specific OSHA regulation for SPHM.

State Regulations

In lieu of a federal standard, 11 states (CA, IL, MD, MN, MO, NJ, NY, OH, RI, TX, and WA) have passed SPHM legislation. Unfortunately, the scope of state laws varies. However, there is some evidence to support that in states with SPHM legislation, patients are more likely to be mobilized with SPHM technology, and there is a decrease in WMSDs associated with patient handling.^{13,139-141}

Standards and Guidance from Professional Organizations

In 2013, the American Nurses Association (ANA) published the *Safe Patient Handling and Mobility: Interprofessional National Standards*. The second edition of this standard was published in 2021 and details eight evidence-based standards required to implement and maintain a successful SPHM program:¹⁴²

1. Establish a culture of safety.
2. Implement and sustain an SPHM program.
3. Incorporate ergonomic design principles to provide a safe environment of care.
4. Select, install, and maintain safe patient handling technology.
5. Establish a system for education, training, and maintaining competence.
6. Integrate patient centered SPHM assessment, plan of care, and use of technology.
7. Include SPHM in reasonable accommodation and post-injury return to work.
8. Establish a comprehensive evaluation system.

SPHM Laws and Standards in the US *continued*

This groundbreaking document was developed by an interdisciplinary group of SPHM experts and, in lieu of federal SPHM regulation, is considered the ‘gold standard’ for SPHM programs in the US.^{39,135}

In a meta review of workers’ compensation claim data in 50 states in 2016 and 2018, health care systems using the ANA SPHM standards demonstrated a significant decrease in the average total cost of a workers’ compensation claim.^{143,144}

Other professional groups such as the Association for periOperative Registered Nurses (AORN) and the National Association of Orthopedic Nurses (NAON) have also developed SPHM guidelines specific to their specialty practice area.^{145,146}

In 2004, the American Physical Therapy Association (APTA) published its first white paper exploring strategies to improve patient and HCW safety in SPHM tasks. In 2014, the APTA introduced standards recommending the development of safe patient handling (SPH) training programs, and in 2019, the association issued a position statement on the role of a physical therapist in these programs.¹⁴⁷

The 2021 Fall Representative Assembly of the American Occupational Therapy Association (AOTA) approved the recommendation to move forward with a policy in support of SPHM that recognizes that ‘occupational therapy practitioners have unique expertise to offer with a focus on occupational engagement. Development of a professional policy on SPHM promotes a safer working environment for occupational therapy practitioners and HCWs, with improved safety and outcomes for patients.’¹⁴⁸

The Need for SPHM Education in Health Care Student Curriculum

Student Injuries Related to Patient Handling Activities

Unfortunately, WMSDs related to manual patient handling are also prevalent in the nursing, physical therapy, and occupational therapy student population.¹⁴⁹⁻¹⁵³

Several studies describe the incidence of low back pain in nursing and occupational and physical therapy students. Nursing students, for example, report a significant increase in the lifetime cumulative prevalence of back pain from beginning to completing nursing school.¹⁵⁴

Although low back pain in the student population is attributed to multiple factors, including prolonged sitting and sports activities, the primary cause of low back pain in nursing and occupational and physical therapy students appears to be related to manual lifting and moving of patients during clinical rotation.^{149,152}

Nursing and occupational and physical therapy students report performing unsafe patient moving and handling activities during clinical rotation. If SPHM practices are not present in the location they are assigned to, they do not feel comfortable advocating for safer practices because they want to fit into the HCW team.¹⁵⁵

Little research has been conducted on the impact of suffering low back pain or other WMSDs as a student on practice after graduation; however, the recurrence rates of low back pain in nurses exceeds 70%. Thus, it can be inferred that health care students entering the workforce after graduation are at a high risk for WMSDs associated with manual patient handling activities.^{9,154} This may contribute to the high turnover rates experienced in the nursing population within the first year after graduation.

The prevalence of low back pain related to manual patient handling in other health care student groups such as radiation therapy and nursing aides could not be found in recent professional literature. It is possible that, because WMSDs are cumulative in nature and the duration of education for these professionals is shorter than that of nurses and occupational and physical therapists, symptoms may not manifest until after graduation or with the increased exposure to physical risk factors once employed.

Given what is known about the prevalence of low back pain and other WMSDs in the nursing, occupational therapy, and physical therapy student and new graduate populations, SPHM curriculum should be included in the education of all students who will perform patient handling tasks as HCWs to decrease their risk of injury and to retain the health care workforce.^{20,156}

Changing the Culture in Health Care

Despite the evidence that comprehensive SPHM programs can be effective in reducing costly HCW injuries and enhancing patient safety and outcomes, the inclusion of SPHM in health care facilities in the US is variable.

Common barriers to implementing and sustaining SPHM programs and the use of SPHM technology are diverse but typically are related to an organizational and professional practice culture that prioritizes patient safety over health care worker safety and lacks understanding of the relationship between the two.¹⁵⁷⁻¹⁶¹

This includes a lack of policies mandating SPHM technology use, insufficient training to understand why and how to use technology safely and efficiently, and inadequate staffing and absent culture of support at the department or unit level to facilitate technology use. SPHM technology that is not easily accessible, nor well maintained, is insufficient in quantity, or is inappropriate for patient mobility tasks, are also factors that relate to lack of organizational commitment to support HCW safety.¹⁵⁷⁻¹⁶⁰

Social pressure from staff to perform a lift manually, the perceived ability of the patient to assist in a lift or transfer, and the perception that using SPHM technology may take longer than performing a task manually, are factors that influence the use of SPHM technology by nurses and aides.¹⁵⁹

Despite evidence supporting the use of SPHM in rehabilitation, some physical and occupational therapists perceive that the use of SPHM technology will not facilitate progressive rehabilitation and may even lead to patient dependence.¹⁶²

These organizational and professional culture traits foster risky behaviors by HCWs, such as a disregard for personal injury when performing patient handling tasks and a decrease in motivation by HCWs to use SPHM technology.¹⁵⁹

Frontline HCWs are not aware of the fundamental risks associated with manual patient handling and the benefits to patients when using SPHM technology and work processes.¹⁴² HCWs have traditionally focused on the safety of their patients and not themselves; thus, there needs to be a paradigm shift to include a culture of safety for all.^{20,163}

Changing Culture with SPHM Curriculum

The earlier SPHM is introduced into health care student education, the more likely these students are to integrate SPHM principles into practice.^{14,164} This will not only empower students to maintain their own safety and health but to improve patient outcomes by advocating for use of SPHM technology. Empowering students in this way assists to facilitate the change needed to create a safe patient handling culture in all health care facilities in the US.¹⁰⁶

Given the looming shortage of nurses and other HCWs, knowledge of SPHM also allows graduates to choose employment with health care employers who actively foster a culture of worker and patient safety and support effective SPHM programs.

Facilitating New Graduate Competency and Confidence

Teaching proper body mechanics in educational programs has not protected health care students or graduates from injuries associated with patient handling. Furthermore, new graduates who work in health care settings with SPHM programs must ‘unlearn’ what they learned as normative practice in school.

An evidence-based and integral component of effective SPHM programs is education and training of HCWs on SPHM principles and the use of SPHM technology and best work practices.^{5,20,154,165}

Academic preparation for SPHM across health care professions is lacking, creating a knowledge deficit that must be addressed upon initial employment in the workforce. Educating entry level health care

professionals to develop SPHM skills upon hire is time intensive and places additional resource demands on the already over-burdened health care system. Therefore, to better inform HCW understanding of the physical demands and risks in their day-to-day roles, and to promote their health and well-being, incorporating SPHM education in professional education programs is a necessity.

Teaching SPHM is not yet required by accrediting agencies in the US. Keeping patients safe is usually the primary requirement which defines whether a student passes or fails a particular skill.

Shouldn't we be equally concerned with keeping our students safe and able to provide evidence-based care to the patients they are learning to help?

Students are taught needle stick precautions and use of personal protective equipment to protect against infection and disease. Yet body mechanics and manual handling are often relegated to a couple hours of education using techniques that have been taught for decades and have proven to be hazardous to HCWs.

Birmingham City University, England, which graduates most of the United Kingdom health care professionals, considers student safety a responsibility. This includes a concern for safeguarding the long-term careers of the students the university sends out into the health care environment.¹⁶⁶ In Australia and Ireland, health professional students are required to update their patient moving and handling skills annually.^{19,167}

The need for SPHM education in health care student curriculum is summarized in Figure 9.

Figure 9.

Summary of the Benefits for SPHM Education in Health Care Student Curriculum in the US

Benefits to students

- Prevent student WMSDs related to manual patient handling.
- Prevent WMSDs in new graduate health care professionals related to manual patient handling.
- Foster a culture of advocacy and confidence in students to integrate SPHM into their post-graduate practice.

Benefits to patients the students care for while in school and after graduation

- Enhance patient safety.
- Promote patient outcomes and recovery principles.
- Develop stewards to support and promote a culture of patient and HCW safety.

Benefits to health care organizations where students and graduates will work

- In the competitive health care environment, hire and retain new graduates with SPHM knowledge.
- Facilitate a culture of SPHM in all patient care settings across the health care continuum.
- Reduce financial and resource burden related to training of new hire graduates with no prior training in SPHM.
- Reduce workers' compensation insurance costs.
- Reduce financial and resource burden associated with WMSDs and replacing injured HCWs.
- Set the foundation for HCW safety and advocacy by teaching SPHM as best practice.
- Impart the value of SPHM technology to promote recovery principles.
- Reduce burden on clinical rotation instructors/preceptors and students through previous SPHM technology exposure and training.

Benefits to the health care education institution

- Provide academic programs that keep students safe in their field of practice.
- Reduce workers' compensation insurance costs.
- Be a leader in evidence-based education for health care practitioners of the future.
- Teach fulfilling evidence-based best practices related to current methods of safely mobilizing patients that incorporate the use of recovery principles, enhance outcomes, and reduce length of stay.

Literature Review

A literature review was conducted to gather published articles related to SPHM curriculum content within education programs for nurses and allied health professionals. Information about the prevalence of WMSDs related to manual patient handling in health care student and new graduate populations was also collected.

The search interface was the EBSCOhost Research Database, which is comprised of 25 databases including CINAHL (Cumulative Index of Nursing and Allied Health) Plus and Medline. An initial search obtained a sense of the volume of literature. Next, the search was refined and limited to English language academic journals and reports including dissertations from January 2005 through February 2022.

This time period was chosen because inclusion of SPHM within health care student education programs in the US prior to 2005 was not formally reported. This is likely because SPHM was a relatively new concept in the US at that time.

The search included all studies and case reports no matter the methodology.

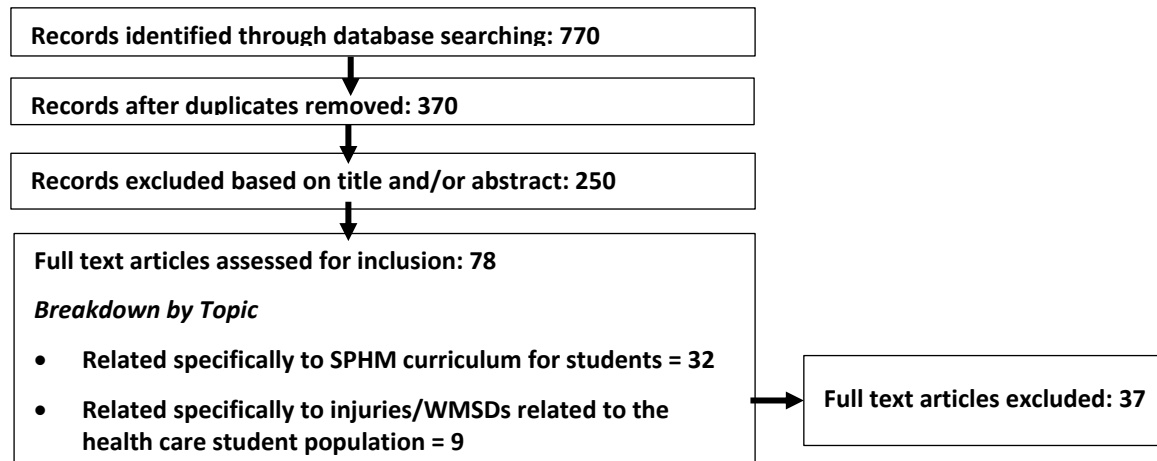
The search words used in combinations were safe patient handling, moving and handling of people, patient lifting, manual handling training, curriculum, education, training, simulation, teaching, perception, students in combination with nurses, physical therapy, physiotherapy, occupational therapy, radiology, radiotherapy, technologist, technician, nursing aides, health care, musculoskeletal disorders/injuries, back injuries, and back pain.

The search produced 770 titles with abstracts. Once duplicates were removed, the curriculum work group conducted a title and abstract review that excluded 250 studies.

Finally, 41 articles remained for inclusion and were broken into two categories, those related specifically to SPHM curriculum for students and those related specifically to injuries and WMSDs reported in the health care student population. References from the remaining articles published between 2014 and 2021 were reviewed to identify any other publications that should be included. This period was selected because these references were more likely to have been published after 2005.

Figure 10.

Flow Chart of Article Selection Process



The History of SPHM in Health Care Student Curriculum in the US

In 2004, experts from the American Nurses Association (ANA), the National Institute for Occupational Safety and Health (NIOSH), and the Veterans Administration (VA) National Center for Patient Safety, supported by funding from NIOSH, collaborated to develop and pilot a flexible, comprehensive, and effective SPHM curriculum module for nursing educational programs.¹⁶⁸

The curriculum was developed to address the gap between the increasing focus on SPHM to reduce the risk of WMSDs in nurses in US health care facilities and the outdated manual patient handling techniques traditionally taught in schools of nursing.¹⁶⁹

The goal of the curriculum was to help nursing educators design student training programs that promote safer approaches to handling patients and contribute to the prevention of WMSDs.¹⁶⁹

The curriculum consisted of seven didactic materials, two clinical simulation laboratory or 'skills lab exercises' and 14 hands-on practice items using SPHM technology. The didactic materials included background information about SPHM, required readings, a two-hour narrated slide show, and a quiz. Skills lab exercises included assessing a patient's mobility needs and use of SPHM decision algorithms.¹⁶⁵ Implementation instructions for nurse educators were included.

The curriculum was designed with both the learner and the faculty in mind and was flexible enough to allow for various teaching strategies. Materials and laboratory exercises were presented in a variety of

modes (visual, auditory, kinesthetic, reading, and writing) to accommodate a variety of learning styles.¹⁶⁸ Faculty later reported using didactic, lab and demonstration, and computer-based strategies.¹⁶⁷

Twenty-six nursing education programs from across the US were selected to participate in the pilot study. All but one were baccalaureate nursing programs.¹⁶⁸

Nursing faculty from the intervention schools attended the 2005 annual VA National Center for Patient Safety SPHM conference, as well as pre- and post-conference workshops, to hear from experts in the field, learn about the curriculum, and give feedback to the curriculum developers.^{165,168} Faculty received training in use of the curriculum materials and delivered this to their nursing students. Six SPHM technology vendors agreed to loan technology to all 26 programs and assist in training faculty in the use of SPHM technology.¹⁶⁸

The new SPHM curriculum was implemented in the participating nursing schools in the fall of 2005. Effectiveness of the module was evaluated through pre/post questionnaires and by comparison to three control nursing education programs using traditional curricula for patient handling.¹⁶⁸

Pre/post questionnaires revealed significant improvement in students' general knowledge, attitudes, and beliefs regarding SPHM. When compared with control sites, students scored significantly higher in general knowledge and beliefs and in attitudes toward using mechanical lifting devices. These students also tested as having a more positive attitude toward and being more likely to use mechanical lifting technology.¹⁶⁵

Program fidelity assessment results revealed that 65% of the hands-on module element was incorporated into school programs, as well as 83% of the didactic items and 92% of laboratory activities.¹⁶⁵

Assessment of the piloted SPHM curriculum module demonstrated that the program significantly changed the knowledge, attitudes, and beliefs of the nursing program students and educators, and that the curriculum would continue to be used.¹⁶⁵ However, the relationship between SPHM curriculum and the use of SPHM technology by nurses in clinical practice after graduation or change in injury rates associated with use of SPHM technology is not reported.

In 2009, NIOSH made the *Safe Patient Handling Training for Schools of Nursing: Curricular Materials* freely available on its website. The curriculum is now in need of an update, and the narrated PowerPoint is on an unsupported software format.

Current State of SPHM within Curriculum for Health Care Professions in US

Despite the efforts of NIOSH, health care student education programs have been slow to integrate the NIOSH *Safe Patient Handling Training for Schools of Nursing* content as part of standard curriculum.

In 2018, a survey was performed of US nursing schools to evaluate the extent to which evidence-based SPHM content such as the NIOSH curriculum and resources was present in curricula. A total of 2,196 US nursing academic programs awarding baccalaureate and associate degrees was identified, and 1,875 programs were contacted directly to request inclusion in the study.

The study findings indicate that 51.3% of the 228 respondent programs had adopted the NIOSH curriculum.¹⁶³ However, more than 90% of respondents indicated that curricula still included traditional manual patient handling: the use of draw sheets for repositioning patients in bed; the use of body mechanics to reduce one's risk of injury; and the use of gait belts for standing, pivoting, transfers, and ambulation.

Interestingly, course instructors (40%) reported assisting in implementing SPHM at clinical teaching sites, but only eight of those had attended a national SPHM conference. In addition, a very low percentage of schools reported having powered lift technology and friction-reducing devices available for skills lab teaching.¹⁶³

Considering the low study response rate of 14.2%, a 51.3% outcome for adoption of the curriculum is substandard in promoting health and well-being of novice health care professionals in performance of their work responsibilities.¹⁶³

Collaborating with physical therapy has been identified as a strategy to improve implementation of the NIOSH curriculum.¹⁶³ In 2019, the American Physical Therapy Association updated its position statement regarding SPHM in practice stating, "The American Physical Therapy Association supports physical therapists and physical therapist assistants employing the concepts of safe patient handling and mobility while providing services, and leading the development, implementation, refinement, and maintenance of safe patient handling and mobility programs on an institutional level and at the local, state, and federal government levels."¹⁴⁷

However, occupational therapy and physical therapy education programs also lag in integrating SPHM content into curriculum. As with nursing programs, manual handling techniques are still taught as 'best practice' to mobilize patients. In programs where physical therapy students have been exposed to SPHM principles, some research has shown students report having more intentions to seek out SPHM technology for use during clinical practice. However, only one of these studies reported details about the curricular design that is used to deliver this information to students.¹⁴

If therapists are to take a leadership role in promoting SPHM principles, it is critical that SPHM is integrated early and throughout their education to increase the likelihood that students will integrate SPHM into their clinical practice after graduation.¹⁴

Only one study appears to have been published that examines the prevalence of SPHM in occupational therapy curriculum. This study examined curriculum inclusion of SPHM as a standard of practice and confirmed that 20.3% from 118 responses out of a total of 238 US occupational therapy academic programs included SPHM education, while 78% continued to teach traditional manual handling techniques as the standard.²⁰

There is little published information about the use of SPHM curriculum in other health care student education programs such as those for nursing aides and radiation technologists.

There is a small body of research that examines integration of SPHM into curriculum for radiologic technology students. Use of SPHM technology and practices in clinical rotation following various methods of SPHM instruction was evaluated. The research identified barriers and potential instructional approaches to successful use of SPHM by the students.¹⁷⁰⁻¹⁷²

Gaps and Barriers to Implementing SPHM into Curriculum

There is some literature that describes successful integration of SPHM curriculum into a small number of nursing and physical and occupational therapy education programs. These are described later in this paper.

However, despite the wealth of evidence supporting that manual handling of patients is inherently unsafe,^{30,36, 173,174} educators in schools for health care students continue to teach traditional manual patient handling techniques and body mechanics that have been proven ineffective in reducing the risk of WMSDs, while leaving unaddressed the associated risks to students, HCWs, and patients.^{22,168, 175,176}

Education programs have a duty to teach SPHM

Teaching SPHM is not yet required by educational accrediting agencies in the US; however, keeping patients safe is usually the bottom line in defining whether a student passes or fails a particular skill. Faculty also have a duty to keep *students* safe. Students have a right to be informed about the occupational health and safety risks they may be exposed to in the career they have chosen and ways to mitigate those risks and prevent injury or harm.

Professors at Mercer University in Georgia concluded that “Given the incidence of WMSDs among physical therapists, we have a responsibility to promote use of SPHM technology when it will benefit either the patient or the health care worker, or both.”¹⁷⁷

In countries such as Australia and the UK, where universities are legally bound to teach SPHM, educators cite the moral obligation to teach SPHM to health care students.^{151, 167, 178}

Faculty have an obligation to teach to ethical principles and standards of practices as set forth by associations and accreditation entities that support health care professionals, such as:

- ANA Nursing: Scope and Standards of Practice¹⁷⁹
- The AOTA Standards of Practice for Occupational Therapy¹⁸⁰
- The APTA Standards of Practice for Physical Therapy¹⁸¹
- The Commission on Accreditation in Physical Therapy Education (CAPTE) Rules of Practice and Procedure¹⁸²

Thus, teaching current evidence-based SPHM principles in student curriculum would meet the intent health care standards of practice.

Review of current evidence and expert consensus by the authors of this paper identified the following drivers that create the gaps and barriers influencing adoption and sustainability of SPHM into health care curricula. The external drivers described below influence the internal drivers within health care schools.

An approach to addressing these drivers and promoting adoption of SPHM curriculum is described later in this paper.

External Drivers

Health care culture in the US focuses primarily on patient safety.

Loeppke et al., stated that “since the publication of the Institute of Medicine’s groundbreaking report To Err is Human in 2000, patient safety has become a key health care issue, driving decision-making and policy formulation in virtually every sector of health care”.¹⁸³ The Triple Aim Initiative, launched in 2007 by the Institute for Healthcare Improvement (IHI), helped to further entrench a patient-centric culture in an effort to improve the US healthcare system. In the past decade, there has been a realization that, for the Triple Aim to be successful, the safety and health of HCWs, primarily related to preventing fatigue and burnout, must also be addressed. In 2014, the Quadruple Aim was developed, incorporating HCW well-being as a key factor to the success of the Triple Aim.¹⁸⁴ However, the incorporation of HCW safety and health as a driver that improves patient outcomes is still a relatively new concept in the US health care system and does not appear to have trickled down into health care student curriculum.

Similarly, health care schools appear to be unaware of the evidence that supports the relationship between SPHM and improved patient outcomes as described in this paper.

Lack of national SPHM regulation, e.g., a federal standard enforced by OSHA

The lack of national SPHM regulation may have contributed to the patchwork approach to SPHM that is observed in health care organizations across the US. There is variability in prevalence and scope of SPHM programs within acute care facilities and across the health care continuum.¹⁸⁵

This, in turn, does not promote SPHM as an accepted standard of care in health care, which would help to support integration of SPHM into curriculum so that students could be taught to this standard.

Efforts to pass national SPHM legislation have been attempted for more than 20 years but have not been successful.

The lack of a nationally-recognized and standardized approach to SPHM also contributes to the variable efforts to promote SPHM that are observed within states and professional organizations.

For example, 11 states have enacted SPHM laws or resolutions that require implementation of SPHM programs; however, each law varies in scope and applicability to health care settings such as hospitals and nursing homes, or both. None of these laws incorporate requirements that specifically address SPHM training for health care students.

The Occupational Safety and Health Administration (OSHA), the National Institute for Occupational Safety and Health (NIOSH), and the American Nurses Association (ANA), together with numerous other national and international professional organizations such as the American Physical Therapy Association (APTA) and the Association of periOperative Registered Nurses (AORN), have published evidence-based standards and guidelines that support and promote SPHM programs.^{163,186}

However, there is *not one* consistent global definition of SPHM. For example, NIOSH defines SPHM as “the use of mechanical equipment and safety procedures to lift and move patients so that HCWs can avoid using manual exertions and thereby reduce their risk of injury. At the same time, patient handling ergonomics (AKA SPHM) seeks to maximize the safety and comfort of patients during handling”.¹⁸⁷ However, another definition found in literature is “SPHM refers to the application of ergonomics to lifting, transferring, repositioning, and mobilizing patients in order to prevent staff injuries and optimize patient mobility”.¹⁶² The definition for SPHM and SPHM programs also varies in each state with an SPHM law. Outside the US, the term ‘moving and handling of people’ is more commonly used than SPHM.

The term ‘safe patient handling’ has been interpreted as using body mechanics and traditional assistive devices such as gait belts, not powered and non-powered SPHM technology and evidence-based work practices. This is evidenced by the description of safe patient handling and ergonomics in the 2019

National Council of State Boards of Nursing (NCSBN) National Council Licensure Examination for Nurses (NCLEX-RN®) Test Plan exam for RNs as described below.

Lack of recognition or requirement by licensing entities and education-related professional organizations to require schools to include SPHM in curriculum

Examinations offered by professional certification bodies such as the National Board for Certification in Occupational Therapy (NBCOT) and the Federation of State Boards of Physical Therapy (FSBPT) do not include questions about SPHM, thus continuing to promote manual patient handling as the standard of care.^{163,165,168,175}

A reference to ergonomics principles and safe patient handling is included in the current NCSBN NCLEX-RN® Test Plan exam for RNs published in 2019. The test plan states under Safety and Infection Control that the test covers “use [of] ergonomic principles when providing care (e.g., safe patient handling, proper lifting)”.¹⁸⁸

However, the ergonomics principles described are limited, still refer to ‘proper lifting’, and do not include any reference to SPHM technology. Additionally, it is unclear to what extent test items actually reflect these very broad principles.¹⁶³

A theory practice gap exists between what is being taught academically versus what is being performed clinically.^{20,163,165,175,178,189-192}

Few core textbooks include current evidence-based principles of ergonomics and SPHM.

There are few core textbooks that include content on SPHM.^{163,165,168,175} Unfortunately, some of those that make recommendations for the use of SPHM equipment when moving and transferring patients also include photographs of nurses repositioning patients in bed using draw sheets. As previously discussed, the definition of SPHM is not universally interpreted correctly.

Lack of consistent SPHM practices in clinical practice locations

As previously discussed, the variability in prevalence and scope of SPHM programs in health care organizations creates a lack of consistent SPHM practices in clinical practice locations. Thus, students may learn about evidence-based practice and SPHM but not be supported and have reinforcement during their clinical experiences. Conversely, students may not have SPHM education provided to them in their curriculum but be expected to be knowledgeable about SPHM when performing clinical tasks.

Health care professional organizations may support the use of SPHM programs to enhance worker and patient safety; however, they rarely recommend SPHM education in student curriculum to facilitate this goal. For example, the APTA defined the role of physical therapists and physical therapist assistants as leaders in SPHM but did not include recommendations for standardized curriculum content to fulfill this role.¹⁴

There is a large portion of research related to SPHM education for students which cites the lack of SPHM programs and technology in health care facilities that are used for clinical rotation.

McGrath found that 70% of occupational therapy students participating in clinical practice had experience with a supervisor suggesting techniques they knew were unsafe. Thirty percent said nothing because they did not know of an alternative, the patient was in distress, or they feared a negative impact on their grade.¹⁹ When discussing the gap between SPHM education and practice, Cornish and Jones summarized it well: “Students in such situations need strategies to help them challenge poor practice and reduce the risk of injury to themselves and others.”¹⁹³

Lack of standardized curriculum in core evidence-based SPHM principles that is relevant to practice needs by discipline for all health care students who perform patient handling tasks

There is no standard curriculum for education of SPHM in health care schools across disciplines. SPHM curriculum needs to be relevant for the patient handling tasks performed by different health care professionals, e.g., radiology technicians vs. physical and occupational therapists vs. nurses and nursing aides.

As previously discussed, a national SPHM curriculum for schools of nursing was published in 2009. Though widely promoted, the curriculum did not appear to change the teaching of unsafe practices such as the use of draw sheets for repositioning patients that is still found in nursing school curricula.¹⁶³ Additionally, this curriculum needs to be updated to reflect current SPHM practices.

Internal Drivers

These are the practices that are influenced by the external drivers described above.

Lack of awareness of evidence-based SPHM principles and the importance of maintaining student, patient, and HCW health and safety

The lack of awareness of SPHM principles and the relationship to patient, student, and HCW safety, coupled with the lack of need to incorporate SPHM into curriculum for examination and licensing requirements, contributes to the following barriers to integrating SPHM into curriculum:

- Lack of recognition by educators of injuries sustained by health care students and workers related to manual patient handling.
- Difficulty in obtaining school leadership support, and opinion leaders objecting to change.
163,168,173,185
- Influence of other peers/professionals (educators and students).
- Educators unaware that traditional manual patient handling is unsafe even when using ‘proper body mechanics’.
- Educators unaware of SPHM principles and thus not teaching evidence-based practice.
- Educators may feel neither proficient nor competent in teaching SPHM principles due to lack of experience in use of SPHM technology and understanding of how SPHM can be integrated into specific clinical practice.^{20,163,165}
- Expectation by educators that rehabilitation therapists are the mobility/SPHM experts.

In therapy education, there is a focus on manual patient handling rather than the utilization of SPHM technology for evaluation and treatment. As with some schools of nursing, therapy schools continue to teach manual patient handling skills as the standard of practice, in part because the educators are unaware they are teaching unsafe practices.²⁰ Therapists are considered the mobility experts by their health care colleagues and, in turn, therapists may help to create the culture and expectations to rely on therapists as mobility experts by teaching their colleagues how to use ‘proper body mechanics’ to transfer/move patients. However, research shows therapists also experience WMSDs related to patient handling.^{20,192}

Schools do not have SPHM technology available in clinical skill labs

Additional barriers to SPHM inclusion in curriculum include the fact that schools may not have SPHM technology, nor the resources to purchase or space to store technology.^{20,163,174,178}

Schools may not be aware of the type of SPHM technology needed; however, budgetary barriers to purchasing technology may be due to a lack of understanding about the importance of needing the technology and therefore making it a priority for purchase.

Perception of ‘no time’ for additional content in an already packed curriculum

Faculty report time constraints in adding additional content to an already full curriculum.^{168,174,178} They may find it challenging to identify ways to integrate SPHM into existing curriculum, i.e., screening of

mobility status and use of appropriate devices to deliver treatments or perform care tasks and including SPHM devices as part of the professional modalities.

There may also be a need for curricula to be tightly aligned with national board exam priorities for specific regulated professions and related state and national licensing standards. The perception may be that there is no room for incorporating SPHM if board exams do not include this content.

Figure 11 summarizes the external and internal drivers that influence implementation of SPHM education in health care student curriculum.

Figure 11.

Summary of External and Internal Drivers that Influence Implementation of SPHM Education in Health Care Student Curriculum.

Implementing SPHM into Curriculum	
External Drivers	Internal Drivers
<ul style="list-style-type: none"> • Health care safety culture in the US that focuses primarily on patient safety vs. worker <i>and</i> patient safety • Lack of national SPHM regulation, e.g., a federal standard enforced by OSHA • Lack of recognition or requirement by licensing entities and education professional organizations to require schools to include SPHM in curriculum • Few core textbooks include current evidence-based principles of ergonomics and SPHM • Lack of consistent SPHM practices in clinical practice locations • Lack of standardized curriculum in core evidence-based SPHM principles that is relevant to practice needs by discipline for all health care students who perform patient handling tasks 	<ul style="list-style-type: none"> • Lack of awareness of evidence-based SPHM principles and the importance of maintaining student, patient, and HCW health and safety <ul style="list-style-type: none"> ○ Obtaining school leadership support/opinion leaders objecting to change ○ Influence of other peers/professionals (educators and students) ○ Educators unaware that traditional manual patient handling is unsafe even when using proper body mechanics ○ Educators unaware of SPHM and thus not teaching evidence-based practice ○ Educators not proficient/competent in teaching SPHM ○ Expectation by educators that rehabilitation therapists are the mobility/SPHM experts • Schools do not have SPHM technology in clinical skills labs • Perception of ‘no time’ for additional content in an already packed curriculum

Published Evidence of Successful Integration of SPHM Principles into Curriculum

Introduction

There is a large body of research that describes the design of curriculum and teaching methods to facilitate successful education and training of health care students.

However, finding literature that discusses the teaching of SPHM in a higher educational setting is challenging, and there are few published articles that discuss successful implementation of SPHM curriculum into schools for nurses, rehabilitation professionals, nursing aides, imaging technicians, and other health care students. Nevertheless, some trends do emerge and are described in this section.

Components of effective SPHM education

SPHM education should be multimodal, e.g., delivered via lecture, self-guided computer-based learning, and hands-on practice in simulation and in clinical environments. Education should be integrated and distributed throughout the curriculum, interdisciplinary, and coordinated with clinical sites. Examples and rationale are given below.

Multimodal

Although examples of SPHM being integrated into health care student curriculum are uncommon in the literature, the importance of delivering education and training using multiple modalities to accommodate different learning styles and facilitate learning and retention of SPHM related skills is supported.

Examples from physical therapy programs. Nitz and Johnson described SPHM education for physiotherapy students as including the following components: two hours of lecture; four hours of small-group skill development classes with video; practice under tutor guidance with feedback; problem solving with ‘mock’ patients, with immediate feedback from educators; online scenario-based interactive learning; and an independent learning package. The authors concluded that “our use of a blended learning approach that enabled students to reflect and develop skills inside and outside the classroom appears to have been successful in enhancing self-rated confidence and assessed competence” in students.¹⁹⁴

Active learning, role-play, case scenarios, and video examples help to develop strong decision-making skills for physical therapy students.¹⁷⁷

Examples from occupational therapy programs. In discussing a suggested approach to including SPHM in occupational therapy programs, Slusser et al., suggested that interactive lecture and hands-on experience in laboratory-based sessions, “followed by the moving and handling of actual patients in fieldwork experiences”, is an effective approach for students to learn information and build SPHM skills.¹⁹⁵

The use of computer-based training (CBT) is increasing in academic programs. Hayden and Gallagher et al., conducted studies to examine the effectiveness of CBT for occupational therapy education for SPHM training. Outcomes noted included improved cognition of the principles of SPHM; however, students preferred additional hands-on training in the laboratory to interact and receive feedback from the instructor regarding techniques.^{196,197}

Webb et al., assessed the long-term effectiveness of replacing annual practical handling updates for occupational therapy students with an online training system, combined with competency assessment of skill and safety.¹⁹⁸

During this quasi-experimental longitudinal three-year study, 243 students had access to a multimedia online SPHM training system that replaced the usual annual educator-led practical training.

Year One students received a practical hands-on SPHM training session, after which they had access to an online multimedia interactive SPHM learning system. This was combined with annual 45-minute in-person competency evaluations to measure specific skills when performing four common SPHM tasks.

Trained assessors used a competency assessment tool to collect skills data at critical stages of the program, i.e., the beginning of Years Two and Three and at the end of Year Three.

Results demonstrated significant increases in skill level of students when performing the four SPHM tasks.

The researchers surmise that online training systems that are easily accessed by students at any time, combined with targeted hands-on competency assessment, can be an effective alternative to traditional annual practical updates, thereby reducing educator-led training hours. Additionally, they report that “students have taken more responsibility for their own learning and professional development, demonstrating more positive engagement in preparation for the classroom competency session.”

Examples from nursing programs. Kneafsey and High reported that 73% of surveyed student nurses were confident in their moving and handling skills after university, during which patient moving and handling was taught with a one-hour lecture in Year One and *annual* three-hour skills sessions thereafter. The 27% of students who reported not being confident in their patient handling skills cited lack of time to practice both at school and on clinical placement as the primary reasons.¹⁷⁸

In 2020, Graham used small group educational sessions over a six-week period to teach SPHM to nursing students. The training was voluntary and included a didactic class and a one-hour practice skills session in a laboratory setting. During the skills sessions, students were evaluated for competency using three

different pieces of SPHM technology with either mannequins or other nursing students to play the role of patients. If a student did not meet minimum competency when using SPHM technology, open labs were available for additional practice. Results showed that average scores related to students' knowledge of SPHM rose from 55% prior to the class and skills session to 91% following the SPHM training.¹⁹⁹

Examples from other health care student programs. In another study, radiation therapy students received two one-hour lectures on traditional manual patient handling and SPHM, followed two days later by a two-hour skills lab. They also completed an online, self-guided module. Lab sessions included use of three different pieces of SPHM technology in addition to manual handling practice, use of SPHM decision-making tools algorithms, and two case studies. Surveys completed by students immediately after training and 11 weeks later showed good improvement in knowledge about SPHM but little improvement in attitude and intent to use SPHM technology to move and lift patients.¹⁷¹

Birmingham City University redesigned patient moving and handling education for their students in a variety of health care domains to include methodologies to suit different learning styles, a virtual learning system, and integration between theory and practical approaches. The changes in curriculum resulted in a 92% reduction in student injuries during clinical placement.¹⁶⁶

Current trends in training modalities. For more than 15 years, simulation had been a common tool to teach specific clinical skills to health care students. In a systematic review and meta-analysis, Mulyadi et al., 2021, examined the efficacy of simulation technology-based learning on nursing students' learning outcomes and concluded it may assist them to fill gaps between theory and clinical practice, better preparing them for clinical practice.²⁰⁰

Specific to SPHM, O'Donnell et al., reported that when using a simulation lab to evaluate patient transfer skills, scores on a pre- and post-intervention knowledge assessment improved from 65% to 90%.²⁰¹

Another study found that simulation training using standardized patients and patient simulators was beneficial in increasing student confidence and preparing occupational therapy (OT) and physical therapy (PT) students to practice in the acute care setting.²⁰²

Virtual reality technology is a newer modality that can be used to train health care students in addition to training in a simulation lab and as a potential for alternative clinical placement. There is some research supporting that it could be an effective tool to enhance knowledge retention and student satisfaction.^{200,203-206}

Integrated and distributed throughout the curriculum

Learning any skill takes time, practice, and multiple exposures over time. Integration throughout a student's education is paramount to creating knowledge, skills, and attitudes that will carry over into clinical practice.

Some studies examining SPHM training for OT and PT students report that SPHM should be embedded throughout the curricula to avoid the challenges and ineffectiveness of students attending a single class early in their training.¹⁹

There are differences when recommending at what point in the curriculum SPHM should be introduced. For example, should SPHM be introduced in early patient management courses, and then revisited and reinforced later in various courses as students develop decision-making skills? Or should it be presented after a substantial part of their preclinical practice knowledge and professional skills is learned?^{177,194}

Alternatively, if SPHM is only taught early in a program, should it be revisited again later in the curriculum to allow for development of problem-solving skills in the moving of patients?¹⁹⁴

Haines et al., provide a comprehensive example of how SPHM can be successfully embedded in curriculum using a multimodal approach.

Based on extensive experience teaching SPHM in Doctor of Physical Therapy (DPT) programs in Michigan, Haines and Arnold (2019) recommended SPHM content be threaded through the physical therapy curriculum to address the various applications for SPHM across patient diagnoses, settings, and recovery continuum. Students should also have continuous access to technology and repeated hands-on exposure in using technology in clinical-type situations.²⁰⁷

In a follow-up study, Haines and Arnold, 2021, described a curricular design embedding the recommendations from their prior work.

Throughout the three-year DPT curriculum, students learn and apply SPHM principles and techniques using a variety of learning activities that get more complex each year and follow a revised Bloom's Taxonomy for learning.

Students are able to make decisions about the use of SPHM technology when working with real patients in the university's student-run pro bono clinic.

They reported enhanced student awareness about epidemiology of HCW injuries and limitations of body mechanics in injury prevention, confidence in application of SPHM technologies, and confidence to advocate for SPHM during clinical practice.

Students overwhelmingly reported repeated access to SPHM technology, and the ability to practice and progressively challenge their abilities to utilize SPHM technology in more complex patient scenarios, as factors contributing to their confidence.¹⁴

Another approach to integrating SPHM into OT education was the use of an SPHM residency for OT master's students. Over eight weeks, 14 students completed six education modules and then applied knowledge learned in the community with clients, caregivers, and other health professionals.

They worked directly with vendors in the community setting and examined SPHM programs and policies at hospitals and long-term care facilities by conducting audits and making recommendations. Six months following their residency and graduation from their academic programs, students' experience and knowledge transfer was solicited via qualitative phone interview.

Overall, the nine students who were interviewed were able to consolidate their SPHM knowledge and apply their clinical skills. They reported feeling confident when educating caregivers and health care professionals and gained expertise in conducting audits of SPHM policies and procedures. Feedback was provided to improve the program and included identifying the need for more structure and organization with community stakeholders, more clinical opportunities to work with clients with higher needs and who are more complex, and more time with community OTs and SPHM specialists.²⁰⁸

Interdisciplinary when practical

In a systematic review to assess the impact of interprofessional education (IPE) outcomes related to health care pre-licensure learners and professionals, Spaulding et al., found that IPE was "effective in improving both pre-licensure learners' and professionals' attitudes toward other disciplines and the value placed on a team-based approach for improving patient outcomes". They recommend that future research assess the long-term impact of IPE and objectively assess change in collaborative behavior.²⁰⁹

IPE for SPHM is a model commonly found in hospitals and rehabilitation facilities where PTs or OTs are involved in or responsible for SPHM training of HCWs.

Several studies have shown the effectiveness of peer teaching between PT students and other health professions students in non-SPHM related topics.¹⁵¹

There is some evidence that the use of PT students to teach nursing students about SPHM techniques can be effective. Studies showed that a mix of lecture and practice activities was effective in improving knowledge and skill in patient handling. Many of these case studies involved teaching students basic patient mobility (pivot transfers, bed mobility, etc.) without the use of SPHM technology; however, it may be inferred that the model would be equally effective if SPHM technology was included.^{7,167,210,211}

Boucalt and Howson enlisted fourth year PT students to teach SPHM skills to radiation therapy (RT) students. Students attended two classes; a one-hour theory and demonstration class, and a two-hour practical skills class a week later. The skills class had eight stations that included SPHM technology such as the use of slide sheets, patient mobility assessment, basic manual handling of patients who could bear, and communication skills. There was a high teacher-to-student ratio of no more than one PT

student to two RT students. Peer teaching was found to be a positive experience, and hands-on training was deemed valuable to learn practical skills. The importance of reflective practice was highlighted. Although students reported gaining SPHM skills during the training, there was a sharp decline when using skills during clinical placement due to multiple factors that have been previously discussed in this paper.¹⁷⁰

Peer teaching can increase the knowledge and skill of all disciplines involved, facilitating teamwork, communication, and cooperation between the disciplines and how to work as a team, which is so important in the clinical setting.²¹¹

Coordination with clinical sites

The gap between what is being taught at the university level and the knowledge and skills that students are using during their clinical experiences while enrolled is discussed frequently in the literature. Several authors have cited this as a *major* challenge to successfully implementing SPHM in higher education.^{155, 164, 171, 193, 212} With this in mind, the importance of coordinating with clinical facilities cannot be overstated. Many health care student programs do not know whether their clinical facilities have safe patient handling coordinators.¹⁷⁵

Even the best taught SPHM techniques and principles will erode in the minds and habits of the students if not reinforced in their clinical or workplace. Perlow stated that “There should be a focus on SPHM that is introduced and emphasized in didactic coursework and reinforced and mastered during clinical internships.”¹⁷⁷ SPHM knowledge and skills learned by health care students in schools will only be beneficial if students can apply those skills in clinical settings where there is appropriate SPHM technology and a culture of supporting SPHM practice.¹⁷⁸

Implementing SPHM Into Curriculum - Achieving a Desired State

Overall Goal

The following summarizes the critical need for integration of standardized core curriculum in SPHM fundamentals into the education programs for all health care students who will ultimately provide direct care to health care consumers across the continuum in the US.

SPHM curriculum should be further customized to provide specific knowledge and skills to meet SPHM needs that vary by profession.

Manual patient handling is recognized as a leading hazard of work-related injury to HCWs who perform patient handling and mobility tasks in environments across the health care continuum in the US.

SPHM programs that include the use of SPHM technology, such as powered lifts and stand assist devices, have been shown to be effective at reducing the risk of back injuries and other WMSDs associated with manual patient handling, and facilitating improved patient outcomes.

Despite the evidence, integration of SPHM within health care student education in the US is sparse. As Powell-Cope et al., found in their survey of 228 schools of nursing, even when elements of evidence-based SPHM programs are being taught, “their practical application in skills labs was often lacking”. Schools of nursing, physical and occupational therapy, and other health care disciplines continue to teach outdated body mechanics techniques and use of tools that have been proven to be ineffective in reducing HCW injury. These include the use of drawsheets to reposition patients in bed and gait belts to ‘lift’ and transfer patients to and from bed to chair or commode.

As discussed in this paper, these practices are perpetuated by several drivers or factors that could be addressed using the approach discussed in this section:

- The relationship between the well-being of HCWs and patient safety is globally recognized. Loeppke et al., stated – “Without a safe and healthy work environment for the millions of individuals who provide care for and support the needs of patients, the core goal of ensuring patient safety is placed at risk. Healthy and safe HCWs are more likely to provide care that leads to optimized patient health and safety”.¹⁸³

The COVID-19 pandemic has further highlighted the urgent need to address the physical and psychological well-being of HCWs if organizations across the health care continuum are to retain and recruit sufficient numbers of HCWs to provide quality care and achieve patient safety goals.^{89,213,214}

Therefore, it is incumbent for schools that educate nurses, physical and occupational therapists, and other healthcare professionals to recognize that they play a critical role in driving culture change in health care, equipping students with the knowledge and skills to ensure their health and safety and maximize the well-being of their patients.⁷

- Schools must also realize that many health care students are injured because of exposure to manual patient handling during their education. This increases their risk of aggravating that injury when they start their careers in health care, jeopardizing the sustainability of the health care workforce in the US. Schools have an ethical duty to protect students from known occupational risks such as the injuries associated with manual patient handling.^{163,215}

The Joint Commission’s publication *Improving patient and worker safety: opportunities for synergy, collaboration, and innovation* states that, “Few activities in health care link patient and worker safety more directly than lifting, transferring, repositioning, and ambulating patients.”¹²⁵

Teaching students evidence-based SPHM knowledge and skills, expecting them to use SPHM when providing patient care, and reinforcing SPHM in clinical settings during their education helps to protect students and patients.¹⁶³

- Equipping health care students with the knowledge and skills that demonstrate SPHM is an expected *standard of practice* for patient safety and their own safety, while in school and throughout their career in health care, may also provide a competitive advantage to schools when attracting and retaining students.¹⁶³
- Schools that *do not* refocus health care student education to incorporate evidence-based SPHM principles and skills will continue to be the origin of the problem, using a siloed approach that perpetuates an outdated non-evidence-based education approach to patient handling.^{163,215}
- There is evidence to support that exposure to SPHM principles should begin early in the curriculum, before unsafe manual patient handling practices are established, and then continue throughout a student's education using a multimodal approach.

Didactic education in SPHM principles can provide a foundational level of knowledge; however, education using SPHM equipment and evidence-based techniques at each stage of the curriculum, as it relates to the course content and practical skills, is essential.

This approach includes simulation-based learning that occurs prior to clinical course work and incorporates real world hands-on patient handling and mobility scenarios that are relevant to a student's specific discipline.

Students will then be able to recognize safety risks to themselves and to patients, and they will seek out opportunities and ask about the availability and utilization of SPHM technology and techniques during their clinical rotations and after graduation as health care providers.

- A multimodal and interdisciplinary approach appears to be effective in increasing student competency and confidence to utilize SPHM skills and in promoting collaborative relationships among disciplines such as nursing and PT.

Steps to Achieve Desired State

It may not be possible for schools to change or address all factors that have been identified as potential barriers to integration of SPHM into health care student curriculum. However, ASPHP believes the following directives will achieve the overall desired goal of successfully integrating SPHM into health care student education in the US, thereby facilitating student, HCW, and patient safety.

The first step in this process is publication and dissemination of this white paper, with the goal of raising awareness of deans and program directors of schools of nursing, therapy, radiology, nursing assistant programs, etc., about why and how to effectively incorporate SPHM into curriculum.

It is also essential that discussion occur with licensing, regulating, and other health care student education-related entities to determine and implement a way to ensure that evidence-based SPHM practices are included in licensure exams and education materials.

Such organizations include the:

- National Council of State Boards of Nursing (NCSBN)
- National League for Nursing (NLN) - the voice of nursing educators
- American Association of Colleges of Nursing (AACN) - national voice for bachelor's and graduate nursing education
- Quality and Safety Education for Nurses (QSEN)/Robert Wood Johnson Foundation
- Federation of State Boards of Physical Therapy (FSBPT)
- National Board for Certification in Occupational Therapy (NBCOT®)
- International Nursing Association for Clinical and Simulation Learning

Addressing external drivers that influence adoption and sustainment of SPHM into health care curricula

Directive 1. Change health care safety culture in the US to include equal emphasis on worker and patient safety.

There appears to be an incremental shift toward the goal of integrating a culture of HCW and patient safety within health care organizations in the US. For example, in 2020, the Institute for Healthcare Improvement (IHI) published Safer Together: A National Action Plan to Advance Patient Safety.

This National Action Plan, which was developed with 27 national health care-related organizations, presents a total systems approach to safety. The plan includes 17 specific recommendations for advancing safe and highly reliable care by driving improvement in four foundational areas:

- Culture, leadership, and governance
- Patient and family engagement
- Workforce safety
- Learning system

The foundational areas are prioritized as essential to create total systems safety and establish the necessary conditions for delivering safe care and preventing harm.^{214,216,}

IHI includes SPHM as one of the *priority* programs that should be implemented to address the physical and psychological safety of HCWs and foster a healthy work environment.²¹⁷ Another example of the integration of HCW and patient safety is the role of SPHM within programs that promote early and progressive patient mobility. Early mobility is associated with improved patient outcomes, and there is a growing evidence base that demonstrates the critical role SPHM plays in facilitating early, safe, and continuous mobilization of patients. In fact, SPHM programs may be more successful at reducing HCW and patient injuries when specifically designed to be part of an early mobility program.^{50, 128, 218,219}

Schools could play an active role in promoting this culture change by assisting health care facilities to understand the relationship between HCW and patient safety and the role of SPHM.

Directive 2. Raise awareness of SPHM state regulations and standards.

In lieu of national regulation for SPHM, schools should be aware of SPHM regulation within their own state and be knowledgeable about the ANA *Safe Patient Handling and Mobility: Interprofessional National Standards*. Although the ANA standards are open voluntary standards, they are considered by many SPHM professionals and safety organizations as the evidence-based gold standard for SPHM. *Refer to Figure 8 for more information about the ANA SPHM National Standards and SPHM related standards from other professional organizations.*

Schools should incorporate the requirements of applicable state law and use professional standards as a foundational material as they implement SPHM into curriculum.

Directive 3. Support and assist licensing entities and professional organizations to include SPHM in exams and be an accepted standard of care.

Schools can support and assist to make licensing entities and education-related professional organizations specific to the health care disciplines being taught, aware of the importance of SPHM and need to include current SPHM principles in licensing exams, and recognized as a standard of practice to enable student, HCW, and patient safety.

Directive 4. Request that current evidence-based principles of ergonomics and SPHM are included in core textbooks.

The latest (10th) edition of Perry and Potter Fundamentals of Nursing includes a chapter on current practices in SPHM that is authored by an SPHM expert and practitioner.

SPHM should be included in all foundational textbooks for students in any health care discipline who will be required to handle and mobilize patients. SPHM experts should be enlisted to write for publishers of these texts. Educating publishing houses about the need to include information about SPHM is also needed.

Directive 5. Partner with clinical practice locations.

Clinical partnerships are vital to most health care education programs. These partnerships can be especially beneficial with regard to SPHM education. A college or university may ask SPHM champions or specialists from a clinical facility to teach students as a guest lecturer or as hired adjunct faculty. Students (and faculty) would receive real-world applications and expert advice from the field.

A benefit to health care facilities would be the ability to advise the educational programs about appropriate SPHM interventions to better prepare students coming to their facility for internships and clinical experiences. Facilities often hire students out of their clinicals, so the health care facility working with schools that teach SPHM would be able to employ new graduates with good foundations in SPHM.

The COVID-19 pandemic greatly impacted student access to quality clinical learning environments, with students having to learn in a virtual teaching environment.²¹³ At the time of publication, it is unknown how many schools have been able to have students return to clinical rotation at a health care facility.

It is important, if SPHM techniques are only learned in a simulation environment during student education, that skills taught incorporate patient handling and mobility tasks that the student will most frequently perform and include realistic case scenarios tailored to the student's discipline or future practice environment.

Directive 6. Assist to develop standardized curriculum in core evidence-based SPHM principles that is relevant to practice needs by discipline for all health care students who perform patient handling tasks.

Evidence-based SPHM curriculum that focuses on foundational content and information specific to each student's health care discipline needs to be developed.

Curriculum content should be able to be easily adapted by schools and made freely available to all health care schools in the US. A guide to assist schools and faculty to integrate content into existing curriculum should be offered.

Figure 12 describes an example of the core content that could be included in SPHM curriculum.

Figure 12.

An example of the core content that could be included in SPHM curriculum

Example of content that could be included in SPHM curriculum - Basic foundational principles

- Manual patient handling - scope of injuries, cost to HCWs and students, patients, and health care organizations
- SPHM regulations and industry standards from professional entities including OSHA General Duty Clause protections for employees and ANA SPHM Standards
- Why manual patient handling is so hazardous, i.e., how WMSDs occur and why traditional body mechanics techniques do not prevent injuries to HCWs
- Ergonomics principles as related to SPHM including the use of SPHM technology and evidence-based work practices and body mechanics that help prevent WMSDs
- Multifaceted approach to preventing patient handling related injuries - SPHM programs and a culture of safety for HCWs and patients
- SPHM patient assessment or mobility screening and communication as the foundation for decision making regarding SPHM techniques and equipment to be used to safely mobilize patients
- SPHM as a tool for fall and pressure injury prevention and promotion of safe, early mobilization
- Types and categories of SPHM technology such as powered lifts and slings, and the functions of each, e.g., how to use SPHM technology for movement of patients who cannot participate (passive), to assist patients with Activities of Daily Living (ADLs), and structured rehabilitation for a given structural or functional impairment

This information can be tailored for specific disciplines and patient handling tasks/scenarios that they will encounter

- How to address challenges, e.g., injury risk to students and patients during clinical rotations if SPHM technology is not available

Curriculum-related tools that could also be provided include:

- How to choose equipment for a school (guidelines)
- Entry-level SPHM competencies for students (all disciplines)
- Competency goals for skills check-off in simulation classes and examples of case-based SPHM scenarios for use in skills lab
- Competency goals for clinical rotations if a facility has SPHM technology

Appendix A describes proposed steps to developing and disseminating evidence-based SPHM curriculum content in all health care student programs in the US.

Addressing internal drivers that influence adoption and sustainment of SPHM into health care curricula

Directive 7. Promote awareness of evidence-based SPHM principles and the importance of maintaining student, patient, and HCW health and safety.

- School leadership and opinion leaders understand the importance of and support inclusion of SPHM in the curriculum.
- Peers/professionals (educators and students) understand the importance of and support inclusion of SPHM in the curriculum.
- Educators are aware that traditional manual patient handling is unsafe even when using proper body mechanics.
- Educators are aware that they are teaching evidence-based practice when educating students about SPHM.
- Educators are proficient/competent in teaching SPHM.
- Educators know that rehabilitation therapists are not necessarily SPHM experts.

The approaches already described that will raise awareness about SPHM within schools with health care education programs and address external drivers or factors that have hindered integration of SPHM into curriculum will also assist to address the internal drivers listed above.

Appendices B, C, D, and E provide a variety of resources that faculty can use to educate themselves and their students about SPHM.

Directive 8. Obtain SPHM technology for clinical skill labs.

There are several ways that schools could obtain SPHM technology such as powered lifts and friction-reducing devices. These include working with SPHM equipment vendors to explore lower cost options such as rent to own programs and purchasing refurbished technology. Obtaining older but working technology from hospitals partners when they upgrade to newer models of technology may also be an option.

Schools could work with equipment vendors who supply SPHM technology to the health care facilities that schools already partner with (if those facilities use SPHM technology) and explore options for discounted group purchasing. It may be beneficial for students to learn SPHM skills using the brand or model of technology they will encounter during clinical rotations.

It is recommended that SPHM technology be permanently stored by a school for use in clinical skill labs so that it can be integrated into all patient handling and mobility skills education, becoming part of the way students learn throughout their education.

Procedures for regular cleaning, disinfection, maintenance, repair, and replacement of SPHM equipment based on the manufacturer's instructions should be established.

Although vendors may be able to train faculty on the use of SPHM technology, schools could also work with SPHM program coordinators if present in a hospital partner facility. SPHM program coordinators and champions could assist to provide training to faculty and students and to integrate SPHM into curricula.

Conversely, SPHM coordinators in healthcare organizations affiliated with educational institutions can raise awareness about the need for SPHM curriculum with deans, program directors, and faculty in these schools by offering introductory SPHM classes for faculty and students.

Directive 9. Change the perception of 'no time' for additional content in an already-packed curriculum

SPHM should not be a separate lesson or unit of study for students, just as learning correct use of personal protective equipment (PPE) is not an isolated topic. Once learned, donning and doffing of PPE is progressively incorporated into many different student practice scenarios and practical exams throughout the curriculum. SPHM can and should be integrated into curriculum in a similar manner. Once basic SPHM techniques are taught, they should be applied every time a student has to move or reposition or mobilize a patient during a practice lab or practical exam. Faculty should be encouraged to 'adapt' current student activities, lessons, and scenarios rather than 'adopt' new ones when incorporating SPHM into lesson plans.

In Conclusion

Information provided in this paper highlights the critical need and evidence for integration of SPHM into *all* academic programs in the US that prepare health care students whose jobs will include assisting patients to mobilize.

This need to protect the health and safety of students is more urgent than ever in the post pandemic world if organizations across the health care continuum are to attract and retain HCWs and offer quality patient care.

This paper discusses ways that academic schools for health care students can integrate SPHM into curriculum; however, further research that evaluates the impact of SPHM curriculum incorporated throughout a student's academic education and following graduation needs to be conducted.

Measures of success could include: intent to use SPHM technology and best work practices in daily practice; correct choice and use of SPHM technology to mobilize patients; decreased rates of WMSDs associated with patient handling; and association between the perception of improved HCW safety and well-being, patient or client safety, job satisfaction, and intent to leave employment.

Schools must take a leadership role to proactively address the leading cause of injuries to HCWs in the US and thus facilitate a culture of SPHM in health care organizations, which in turn improves safety for HCWs and their patients.

For more information, refer to the following resources:

Appendix A. Proposed steps to develop and disseminate evidence-based SPHM curriculum content in all health care student programs in the US.

Appendix B. SPHM Education Resources

Appendix C. Curriculum Success Stories. (Provides a snapshot of how some schools have worked successfully with health care facility partners to offer SPHM education in their curriculum.)

Appendix D. How to Get Started in Offering SPHM Education to Students – Tips for Faculty.

Appendix E. (Pictorial) Examples of High Risk Manual Patient Handling Tasks and Safer Solutions Using SPHM Technology.

Appendix A. Proposed steps to developing and disseminating evidence-based SPHM curriculum content in all health care student programs in the US.

1. Review the existing SPHM curriculum content developed by NIOSH and determine content and approach that is usable and what needs to be updated and added.
2. Review newly-described curriculum content (Haines, Arnold, Chen 2021) and others for possible inclusion.
3. Determine entry-level competency for SPHM, i.e., core foundational content for all health care students.
4. Develop a standardized core curriculum in SPHM fundamentals, ergonomic principles, culture of safety, and culture change that resonates across healthcare disciplines. Modalities will include:
 - Didactic education via PowerPoint with lecture and video.
 - Content to guide hands-on experiential learning opportunities using simulation.
 - Clinical scenarios that can be used to enhance the hands-on learning experience and promote interprofessional collaboration and shared decision-making when feasible.
5. Determine specific curriculum content based on job-specific differences within disciplines.
6. Develop adjusted curriculum based on the job-specific differences within occupations such as:
 - Nursing/Nurse Assistant/Medical Assistant
 - Occupational Therapy/Occupational Therapy Assistant
 - Physical Therapy/Physical Therapist Assistant
 - Radiology
7. Develop a strategy to evaluate effectiveness of the curriculum, e.g., scope of use of curriculum, faculty and student satisfaction, use of SPHM skills in clinical rotation and intention to use in practice after graduation, and student injury incident rates.
8. Develop a strategy to ensure use of the curriculum in schools is sustained.
9. Develop an outreach strategy to disseminate curriculum materials and the rationale for use to the:
 - More than 2,600 colleges and universities that offer a nursing degree program in the US.²²⁰
 - 672 colleges and universities that offer a radiologic technology program.²²¹

- 245 institutions supporting 261 accredited physical therapy education programs, plus 58 additional programs in some phase of development.²²²
 - 174 accredited occupational therapy programs.²²³
 - Hundreds of community colleges that offer nursing aide programs.
10. Develop an outreach strategy to connect with licensing entities, education-related professional organizations, and publishing entities to explore advancement of SPHM within licensing exams, foundational textbooks, etc.
 11. Provide curriculum content and other resource materials electronically on an easily accessible website such as the ASPHP webpage.
 12. Develop and offer train the trainer support for faculty who are new to SPHM and for those needing to refresh their knowledge and skills. Foundational information could be offered via webinars together with hands-on SPHM technology training at the annual ASPHP national education event and via regional workshops.

Explore if faculty training can be subsidized by grants.

Faculty training should include the following goals as related to SPHM principles and use of technology:

- Understand the Why (Affective domain of learning)
 - Learn the How (Cognitive domain); What are the tools? How does one use them? When does one use them? (Simple applications advancing to complex applications)
 - Practice the Application (Psychomotor domain). Learn the memory and overcome the learning curve with the equipment in place. Become confident, not just barely competent, in using the equipment.
13. Develop opportunities for faculty to stay updated with SPHM research, practices, and trends.
 14. Evaluate effectiveness of curriculum and of dissemination methods.

Obtaining a research grant(s) and partnership with like-minded organizations to support the work described above could be explored.

Appendix B. SPHM Education Resources

The following are freely available resources that faculty may find useful when incorporating SPHM into curriculum.

Applied Ergonomics for Nurses and Health Care Workers. Training video. Oregon OSHA. 2004.
<https://www.youtube.com/watch?v=Vy8T8BUAbE4&feature=youtu.be>

Applied Ergonomics for Nurses and Health Care Workers - A Guide for Instructors. Oregon OSHA. 2004.
<https://osha.oregon.gov/edu/grants/train/Documents/instructor-guide-safe-patient-handling-in-health-care.pdf>

Bariatric Safe Patient Handling and Mobility Guidebook: A Resource Guide for Care of Persons of Size. Center for Engineering & Occupational Safety and Health (CEOSH). Veterans Affairs. 2016.
<https://www.asphp.org/wp-content/uploads/2011/05/Baraiatrice-SPHM-guidebook-care-of-Person-of-Size.pdf>

Current Topics in Safe Patient Handling and Mobility. American Nurse Today. September 2014.
https://www.myamericannurse.com/wp-content/uploads/2014/07/ant9-Patient-Handling-Supplement-821a_LOW.pdf

Ergonomics in Healthcare: A Continuing Education Program for Nurses, Nursing Assistants, and Healthcare Managers. UMass – Lowell. 2018. www.uml.edu/Research/CPH-NEW/nurse-education/ergonomics/

Injured Nurses. The National Public Radio Special Series. 2015.
<http://www.npr.org/series/385540559/injured-nurses>

Quick Tips for Safe Patient Handling and Mobility. American Industrial Hygiene Association (AIHA) and The Occupational Safety and Health Administration (OSHA). 2014.

English

https://aiha-assets.sfo2.digitaloceanspaces.com/AIHA/resources/OSHA-Quick-Tips-on-SPHM_Final-Mar2014.pdf

Spanish

https://aiha-assets.sfo2.digitaloceanspaces.com/AIHA/resources/Quick-Tips-on-SPHM-Spanish-OSHA-review-6-27-14_FINAL.pdf

Patient Handling and Mobility Assessments. Matz M, et al. Facility Guidelines Institute (FGI). 2nd ed. 2019. https://www.fgiguideines.org/wp-content/uploads/2019/10/FGI-Patient-Handling-and-Mobility-Assessments_191008.pdf

Safe Patient Handling Nursing School Curriculum Module. National Institute for Occupational Safety and Health (NIOSH). 2009. <http://www.cdc.gov/niosh/docs/2009-127/>

Safe Patient Handling (SPH) Training Competency Guide for SPH Champions. Washington State Hospital Association. 2014. http://www.wsha.org/wp-content/uploads/Competency_Guide_for_SPH_Champions.pdf

Time for Safe Patient Handling and Mobility. Training video. Washington State Hospital Association. 2015. <https://vimeo.com/132744617>

Training Curriculum for Homecare Workers. Caring for Yourself While Caring for Others. DHHS (NIOSH) Publication Number 2015-102. National Institute for Occupational Safety and Health (NIOSH). 2015. <https://www.cdc.gov/niosh/docs/2015-102/default.html>

Safe Patient Handling and Movement: Guidance for Health Care Workers. Online training course. The American Physical Therapy Association (APTA). 2011. <https://learningcenter.apta.org/student/MyCourse.aspx?id=ba540aab-937f-485e-a6ce-48b7fbc3d3f&programid=dcca7f06-4cd9-4530-b9d3-4ef7d2717b5d>

Safe Patient Handling and Mobility Guidebook. Center for Engineering & Occupational Safety and Health (CEOSH). Veterans Affairs. 2016. <http://www.tnpatientsafety.com/pubfiles/Initiatives/workplace-violence/sphm-pdf.pdf>

Sample - Safe Patient Handling Observation Survey-Audit. Workplace Safety Initiative. Oregon Association of Hospitals and Health Systems (OAHHS). 2014. https://oahhs.org/assets/Safe%20Patient%20Handling/Worker-Safety_Sample-SPH-audit-with-patient-feedback.pdf

The Caretaker Crisis. Investigating Work-Related Injuries in Healthcare. Video. WA State Department of Labor & Industries. 2015. <https://lni.wa.gov/safety-health/safety-research/completed-projects/safe-patient-handling>

Appendix C. Curriculum Success Stories

Safe Patient Handling and Mobilization (SPHM) content in an undergraduate nursing program, Oregon Health Sciences University (OHSU), Portland, OR

The following poster outlines how the School of Nursing integrated SPHM into the undergraduate nursing curriculum.

In 2017, faculty, with support from the OHSU as a clinical partner and their SPHM program clinical consultant, initiated a program for delivery and spiraling of SPHM concepts and skill development in 3-year Baccalaureate and 15-month Accelerated Baccalaureate curricula. Concepts and skills taught were: ergonomics and risk factors for musculoskeletal injury; use of an evidence-based mobility check algorithm as part of a comprehensive nursing assessment; and hands-on practice with SPHM equipment in the skills lab setting. In year one of the project, the focus was on the earliest clinical courses in the program, with subsequent focus on reinforcing content during later courses.

Development of SPHM skills for student nurses is focused on patient assessment for mobility status and subsequent decision making related to use of appropriate SPHM technology. Although students view a range of SPHM technology available during training, it was determined that faculty should focus hands-on skills training primarily in the use of lateral transfer devices such as friction-reducing sheets and air assist mats. These devices are more frequently used across clinical settings; however, the design and use of powered and non-powered lift systems and slings vary greatly across clinical settings, so teaching students to be competent users of these devices is challenging.

The SPHM program for students is evolving, and in 2023 a new simulating lab for SPHM training of OHSU staff is being built in the OHSU health care student simulation lab facility. This will facilitate closer collaboration between the hospital SPHM program and the undergraduate nursing and other health care student programs at OHSU.

The OHSU SPHM clinical staff also provide annual SPHM training for radiation oncology and dental students.

Safe Patient Handling and Mobilization (SPHM) Content in an Undergraduate Nursing Program

Kristy Lanciotti, MN, RN, CPN; Ginger Keller, PhD, RN, CNS; & Lynda Enos, RN, MS, COHN-S, CPE
Oregon Health & Science University School of Nursing, Portland Campus

INTRODUCTION

Nurses are at high risk for injury (cite stats) and patient are at risk for falls/injury (cite stats). Mobilizing patients puts patients and staff at risk for injury. body mechanics not sufficient. Injuries happening. Hospital populations bigger.

Define "SPHM" (cite). Evidence exists supporting Safe Patient Handling and Mobilization (SPHM) techniques to reduce injury in patients and staff.

BASELINE: OHSU PORTLAND CAMPUS

SPHM was not being taught explicitly or consistently in our undergraduate programs. Faculty and clinical partners recognized the need to prepare graduates to be part of the organizational culture change required to incorporate SPHM into nursing practice. Survey data from students at the end of their program of study confirmed faculty concerns that we were not adequately preparing our graduates to protect themselves and their patients in the clinical setting.

Sample Student Response:

"...when...it was apparent that I was expected to mobilize patients, I always had to call another staff member, but even then did not feel confident in assessing and supporting a patient. I relied on common sense and life experiences, but I did not come out of health promotion feeling like I had adequate knowledge."



School of
NURSING

METHODS

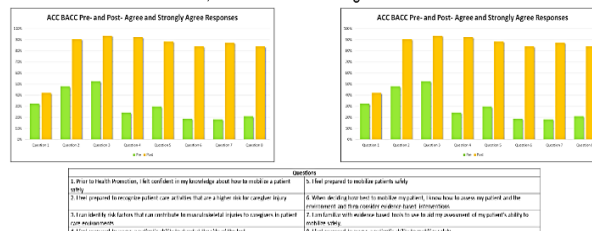
Undergraduate faculty initiated a pilot program on our campus, delivering and spiraling SPHM concepts in the curricula. The content was delivered within the existing Oregon Consortium for Nursing Education (OCNE) competency framework, and aligns with the Quality and Safety Education for Nurses (QSEN) Competency of "Safety."

The pilot program was implemented in Summer and Fall 2017 with two consecutive Accelerated Baccalaureate (Acc Bacc) Cohorts (88 students total) and one 3-year cohort (40 students), and focused on delivery of SPHM content in their early clinical courses.

Content Elements	Acc Bacc Cohorts (Summer/Fall Class of '18)	3-Year (Class of '20)
Ergonomics and Risk Factors for Musculoskeletal Injuries (didactic)	N210B Health Promotion	
Mobility Assessment (didactic)	N210B Health Promotion	
Mobility Assessment Case Study	N/A (added with the third pilot cohort)	N210B Health Promotion
OHSU Mobility Check Algorithm (demo and practice)	N210B Health Promotion	
Equipment: Slipp Sheets and Hovermatts (demo and practice)	N210B Health Promotion	N211 Chronic I
Equipment: Floor Lifts and Ceiling Lifts (demo and practice)	N210B Health Promotion	N/A (eliminated)
Reinforcement of content in later courses in the curriculum	Contextual reinforcement and skills practice in clinical settings, with emphasis on mobility assessment	
	Observation/reflection assignment in N424/425/435 Integrated Practicum (planned)	

RESULTS

Students in the pilot groups were surveyed prior to receiving any SPHM content, and again at the end of Health Promotion, to assess for knowledge and attitudes around SPHM.



LESSONS LEARNED

Success factors:

- Starting with the "why"
- Faculty and student enthusiasm
- Support from
 - Clinical partner (OHSU Hospital)
 - Undergraduate program administration
 - Clinical expert
- Access to supplies and equipment

- Challenge:** Limited time in curriculum, and difficult for students to retain information that is delivered all at once.
- Solution:** Adjusted delivery to include introductory lecture on risk factors for musculoskeletal injury, then opportunity to practice hands on skills concurrently while learning other content in skills lab (e.g. physical assessment, bathing). Identified a workgroup representative from each course in the curriculum, to guide spiraling of SPHM content in their course(s).
- Challenge:** Faculty not trained nor comfortable teaching SPHM.
- Solution:** Identified 3 "tiers" of individual faculty training needs based on role with students in clinical settings.
- Challenge:** SPHM equipment differs between clinical settings, and patient safety policies limit ability of students and faculty to use equipment with patients.
- Solution:** Stopped using skills lab time to practice equipment students never get to use in clinical setting (e.g. patient lifts). Currently updating Faculty Guidance document, including instructions to follow policy of clinical setting.

Safe Patient Handling and Mobilization (SPHM) at GateWay Community College, Phoenix, AZ

Kirsten Berdahl, PT, MEd, CSPHA

Faculty PTA Program, Retired Safe Patient Handling Lab Manager

GateWay Community College, Phoenix, AZ

Nestled in central Phoenix, GateWay Community College has a growing, robust SPHM program. It began when a Physical Therapy faculty member, who was already helping other allied health programs with their body mechanics and patient handling modules, attended an SPHM conference and was an instant SPHM convert. With a \$3,000 grant, a small classroom was converted to a lab, and slide sheets, one manual and one powered sit-to-stand, a mobile lift, and a ceiling lift were purchased. As students came for their usual patient handling labs they were treated to an introduction into the world of SPHM.

Classes were fun and informative, and students began reporting enthusiasm to their teachers. Interest grew. In 2020, the college received additional grant funding to establish a 2,000 square foot lab with multiple types of SPHM equipment. The faculty member transitioned to full-time SPHM lab manager.

These labs now serve all levels of nursing programs (CNA, PN, RN), Physical Therapist Assisting, Occupational Therapist Assisting, Nuclear Medicine, Medical Radiography, Surgical Technology, and Emergency Medicine. They are also available to rent to other educational and health care institutions. Plans are to add classes for home caregivers in the future.

Integrating SPHM into Duke University, Durham, NC

Yeu-Li Yeung, MS, OT/L, CPE, CSPHP

Patient Care Ergonomics Coordinator

Certified Professional Ergonomist & Safe Patient Handling Professional

Duke Ergonomics, Occupational & Environmental Safety Office

Duke School of Nursing (DUSON)

[Accelerated Bachelor of Science \(ABSN\)](#)

SPHM was introduced to DUSON when the Director of the Center for Nursing Discovery (CND), an interactive and student-centered simulation laboratory, met with Duke University Hospital's Patient Care Ergonomics Coordinator in 2007. For the last 18 years, the SPHM lecture is and has been delivered to the ABSN students by Duke University Hospital's Patient Care Ergonomics Coordinator during the first semester's *Health Assessment and Foundations of Nursing Practice Across the Lifespan (NURS 388)* course. In 2015, Duke Health adopted the Bedside Mobility Assessment Tool (BMAT) for nursing staff to use. Thus, this tool was also introduced to the ABSN students. Currently, the BMAT is taught as part of

the standard assessment of the musculoskeletal system, and the students have hands-on practices with BMAT and the lifts available in CND after the SPHM lecture under that guidance of clinical instructors.

The CND received a pair of older but operational floor-based lifts from the hospital in 2008. When the CND was expanded in 2010, the Director received approval to install a ceiling lift in the new simulated lab space, as recommended by the Patient Care Ergonomics Coordinator, and a permanent placement of a bariatric bed from a local vendor. As of 2022, the CND had three new floor-based lifts: dependent, powered sit-to-stand, and active standing device, along with the ceiling lift, that are accessible for hands-on practice for all nursing students.

Current Faculty Members for NURS388 Course:

Kathleen S. Ashton, PhD, RN, CNE
Consulting Associate
Duke University School of Nursing

Margie Molloy, DNP, RN, CNE, CHSE
Associate Professor
Assistant Director, Duke IPEC Center
Duke University School of Nursing

[Master of Science in Nursing](#)

In 2016, Dr. Valerie Sabol, a DUSON faculty member, created the online course *Obesity Across the Lifespan: Fundamental Considerations for Healthcare Providers (NUR536)*, which is offered to both baccalaureate and graduate nursing students and healthcare providers who have successfully completed a physical assessment class. This course was designed to develop core knowledge, skills, and values essential to provide safe, quality care to patients living with obesity across the lifespan and care settings.

Through experiential learning activities, students explore the influence of multiple determinants of obesity from a biopsychosocial perspective. Clinical decision-making and obesity-targeted treatment modalities are emphasized to optimize patient-family outcomes. Guest lecturers from various disciplines speak on different yet relevant topics including SPHM. A video was created to demonstrate the use of SPHM equipment and the skills necessary to deliver sensitive, professional care that focuses on enhancing safety for both patients and healthcare providers. The video was a collaborative effort between nursing, PT/OT, and Ergonomics and is available to [the public](#). This course is still being taught at DUSON as an elective.

Current Faculty Member for NURS536 Course:

Valerie K. Sabol, PhD, MBA, ACNP, GNP, ANEF, FAANP, FAAN
Duke University School of Nursing
Professor & Interim Vice Dean for Academic Affairs (IVDAA)
Adult Acute Care and Gerontology Nurse Practitioner

Duke School of Medicine (SOM), Occupational Therapy Doctorate (OTD) Division

In early 2020, Duke University Hospital's Patient Care Ergonomics Coordinator learned that Duke SOM would launch an OTD program in the fall of 2021. She contacted the Founding Program Director, Division

Chief, and Professor, Dr. Barb Hooper, to learn more about the program and discuss the opportunity to include SPHM in the curriculum and equipment available in the ADL suite. The Patient Care Ergonomics Coordinator introduced Dr. Hooper to the SPHM program at Duke Health by giving her, the Academic Fieldwork Coordinator, and the Vice Chief of Administration and Operations a tour at the hospital to see the applications of SPHM technology in the patient care units and PT/OT gym.

Dr. Hooper and her team were impressed by the capability of the SPHM technology and how it can be integrated into therapeutic interventions to further enhance quality and safety for patients and occupational therapists. They agreed to install a ceiling lift in the ADL suite to provide an environment for teaching future occupational therapists the importance of work safety for themselves and the integration of SPHM technology to develop and facilitate interventions for their clients. Students could also learn about the broader perspectives of having access to SPHM for themselves and patients in terms of health disparities, equity, and justice.

In the fall of 2020, a ceiling lift was donated by the same vendor that works with Duke Health System and installed in the OTD Activities of Daily Living suite due to a collaborative effort between the lift vendor, Patient Care Ergonomics Coordinator, and OTD team. This effort paved the path for integrating SPHM into the OTD curriculum, making Duke OTD the first program in North Carolina to have SPHM lifts available within classroom spaces. Consequently, the Patient Care Ergonomics Coordinator delivered the first SPHM and ergonomics lecture in the *Enabling Occupational Skills I (OTD 504)* course and the hands-on applications with SPHM technology in the *Occupational Transitions III (OTD 510)* course. During hands-on applications, she provided modeling and coaching to students to support their development of sound judgment to support the safety of self, clients, and others when practicing SPHM.

In *Occupational Transitions II*, the Patient Care Ergonomics Coordinator provides further knowledge regarding ergonomics in the workplace for people with physical and mental health impairments. This empowers students to consider work environments more critically, particularly what is provided to support people with disabilities in the workplace and how they as students might be advocates for safer workspaces. She will continue to provide both lectures for future courses. Recently, the OTD program received a pair of older powered floor-based, and powered sit-to-stand lifts from DUSON (because they purchased new ones). Currently, the OTD program's ADL suite has a ceiling lift and two floor-based lifts available for hands-on practice for all OTD students.

Faculty members:

- Abigail Carroll, PhD, OTR/L, Instructor Medical Center
- MaryBeth Gallagher, PhD, OTR/L, BCMH, Professor
- Dr. Barb Hooper, PhD, OTR, FAOTA, Program Director and Division Chief, Occupational Therapy Doctorate Division
- Sheila Moyle, OTD, MOT, OTR/L, Assistant Professor/Academic Fieldwork Coordinator

Appendix D. How to Get Started in Offering SPHM Education to Students - Tips for Faculty

*Courtesy of Kirsten Berdahl, PT, MEd, CSPHA
Faculty PTA Program, Retired Safe Patient Handling Lab Manager
GateWay Community College, Phoenix, AZ*

Starting a safe patient handling and mobility (SPHM) program can be daunting, and squeezing new information into a packed health care curriculum is very challenging. Here are a few tips from the field:

Getting Started

In developing content, use this white paper as a guide to review the safety issues related to manual patient handling, what SPHM is, the benefits and evidence-based principles of SPHM, and important topics for instruction.

1. Start small. Choose one or two classes or cohorts to begin. These can be your pilot group. Start with friction-reducing slide sheets or devices (FRDs) which are simple, inexpensive, very versatile, and easily stored.
2. Adapt current case scenarios and lab activities; don't try to reinvent the wheel.
3. Utilize free videos on the internet such as the UMass Lowell SPHM course *S – a list is provided in Appendix A*.
4. Use association websites: (NIOSH, OSHA, VA, ANA, ASPHP)
5. Offer students incentives to help with research and content development by using SPHM as an honors project, service learning, capstone project, etc.
6. Consider starting with SPHM as an elective component, or for extra credit, to practice, and to collect helpful feedback. If the buzz is good, other students and faculty will hear and want to participate.
7. Use the ASPHP curriculum and related tools as they are published.

Procuring Equipment

1. Again, start with slide sheets. They provide a great introduction to the world of SPHM. Witnessing for the first time a patient (or student) boost *themselves* up in bed is enough to hook their interest, especially if they have had some clinical experience. Develop a clever campaign slogan to get students' attention such as "take an FRD to bed".
2. Apply for grants. There are workforce grants available that will pay for equipment, and for continuing education for faculty.

2. Get to know your vendors. Ask about equipment rentals and refurbished equipment donations.
3. Learn more about your clinical sites. Schedule a field trip.

Gaining Expertise

1. Ask a local SPHM clinical expert to visit your school to share real-world experiences and lend a lot of credence to this new material.
2. Invite SPHM users to sit on your Advisory Panel.
3. Attend an SPHM conference.
4. Look to expert resources – NIOSH, OSHA, VA – for a wealth of information.
5. Join The Association of Safe Patient Handling Professionals (ASPHP).

Coordinating with Clinical Sites

1. Host an open house/equipment fair for local agencies.
2. Develop a speaker's bureau or list of faculty experts.
3. Develop a listserv or other forum for schools and agencies to communicate.
4. Survey students during or post clinical about the availability of SPHM equipment and the best person from their site to contact.
5. Add to your lists of clinical sites which ones have SPHM so students can use that information in their decision-making regarding site selection.

Appendix E. Examples of High Risk Manual Patient Handling Tasks and Safer Solutions Using SPHM Technology

High Risk Manual Patient Handling Tasks



Examples of:

Safer Solutions Using SPHM Technology



High Risk Manual Patient Handling Tasks



Examples of:

Safer Solutions Using SPHM Technology



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