Advancing the Science and Technology of Progressive Mobility

Introduction

This paper serves to explain the intent of the inclusion of the word "mobility" in the recent American Nurses Association (ANA) publication titled "Safe Patient Handling and Mobility: Interprofessional National Standards (SPHM Standards)". The Association of Safe Patient Handling Professionals (ASPHP) applauds the efforts of ANA to raise the standard of care by encouraging active mobility practices throughout the continuum of care in a safe and systematic way.

The effects of immobility and the definition of early and progressive mobility are reviewed in this paper in order to give the reader greater insight into this issue. Two case studies are offered as evidence that early and progressive mobility, utilizing SPHM technology, serves to enhance healthcare recipient outcomes. Finally, gaining physical therapy support unites nursing and therapy goals and allows intervention to take place sooner and without fear of injury due to manually lifting, moving, and mobilizing the healthcare recipient.

The Association of Safe Patient Handling Professionals (ASPHP) not only endorses the SPHM Standards but applauds the addition of the concept of "mobility" to the discussion. This simple change in terminology will help advance the science and technology of SPHM by focusing on promoting active healthcare recipient mobility, beyond the more passive concepts embedded in the safe handling of healthcare recipients. This shift will expand the end goal to focusing on improving quality health outcomes for the healthcare recipient, in addition to providing a safe environment for both the healthcare recipient and healthcare worker.

According to the Bureau of Labor Statistics, musculoskeletal disorders (MSD) related to repeated transfers, repositioning, and ambulation of healthcare recipients has caused nurses to rank fifth in all occupations for the number of cases of MSDs resulting in days away from work[i] . Considerable progress has been made in recent years with the emergence of SPHM technologies, education, programs, and enactment of state legislation. However, MSDs remain one of the leading reasons that skilled, experienced healthcare workers are forced to permanently leave bedside nursing.

Integration of the term Mobility

ANA has been a longtime proponent of safe patient handling and has supported the elimination of manual patient handling. In 2003, ANA launched the Handle with Care© program as an industry-wide initiative to prevent back and other musculoskeletal injuries through partnerships and coalitions, education and training. In 2012, ANA decided it was time to move SPHM to the next level, and convened an interprofessional group of 30 subject matter experts to develop SPHM Standards to be applicable across the care continuum. The working group members volunteered a considerable amount of time and expertise to the development of the SPHM Standards, which were published in June 2013.

In addition to being interprofessional, and applicable across the care continuum, the SPHM Standards updated the 1980s terminology of "Safe Patient Handling," or "Safe Patient Handling and Movement," to "Safe Patient Handling and Mobility," recognizing that safe patient handling is more than simply the passive handling, transfer, and movement of healthcare recipients by the healthcare worker. It is important to note that "healthcare recipients" replaces the term "patient" throughout the SPHM standards. The exceptions to this are instances where the term "patient" is currently ingrained, such as the title.

The working group also discussed the use of the term "handling." The ergonomic research that laid the ground work for SPHM was based on the movement of static loads, such as boxes with handles. Some were concerned that the term implied that healthcare recipients are to be passively handled. Of course, healthcare recipients are not boxes. They do not have handles, are not contained in a central locus, and have minds of their own. One working group member reframed the discussion by pointing out that the root of "handle" was "hands." Therefore, handling was defined within the SPHM standards as "The use of the hands and/or assistive devices to perform an activity. Handling may involve either dynamic (movement) activities, such as repositioning, lifting/lowering, pushing/pulling, carrying or turning; or static (stationary) activities, such as holding or supporting."

The decision was made to add the term "and mobility" to the title to imply the active involvement of the healthcare recipient and healthcare worker, in progressing the activity and mobility level of the healthcare recipient with the potential to improve health and safety outcomes. This is consistent with the evidence-based trend of using SPHM technology to promote early mobilization in the acute care setting, and with rehabilitation efforts in long-term care that have the goal of rehabilitation and restoration of independence, as appropriate. Changing this paradigm refocuses SPHM efforts across the care continuum. The ultimate goal is to increase quality of care while decreasing both healthcare recipient and healthcare worker injuries.

The benefits of early mobilization and the hazards of immobility are well documented in the literature. For instance, Nelson et al. described the link between safe patient handling and patient outcomes in long-term care. Following implementation of a comprehensive SPHM program, patients experienced increased engagement in activities of daily living, and decreased fall risk. ii These findings imply that increased mobility supported these outcomes. Other research has shown that mobilizing the patient will increase patient independence, providing greater self-confidence to the patient, while requiring less support for movement and transferring. This would minimize frequent immobility sequelae of pressure ulcers, deep vein thrombosis, muscle atrophy, pneumonia, and lung atelectasis. In addition, this would minimize time required for patient handling, allowing more time and energy to direct patient care.

To accomplish this, the SPHM Standards require a comprehensive systematic interprofessional approach. All involved are responsible for establishing a culture of safety and addressing mobility, including leadership and healthcare workers. This approach supports healthcare recipient and healthcare worker safety, while supporting improved mobility and quality of care for the healthcare recipient.

Effects of Immobility

In the event any or all of the body is immobilized, a pattern of adverse outcomes emerge.[1] The greater the degree of immobility and the longer the periods of immobilization, the greater the risk for development of these adverse outcomes. Physiologically, no body system is immune to the effects of immobility.

In April 1967, Olson published a landmark article in the American Journal of Nursing titled, the "Hazards of Immobility," which summarized the physiologic changes that occur in healthy, ill, or injured people who undergo prolonged periods of immobility. [iii] The article describes the detrimental effects of immobility on cardiovascular, respiratory, gastrointestinal, musculoskeletal, urinary, metabolic, and psychosocial health. Since Olson's contribution, numerous authors and researchers from a variety of disciplines have addressed immobility on a number of different levels — from the methods and tools available to prevent both threats to healthcare worker and healthcare recipient injury to measurement tools designed to assess functional decline, performance, skin injury, respiratory indicators and more.

Immobility leads to a number of cardiovascular changes. For example, within 24 to 48 hours in the supine position, plasma volume decreases by nearly seven percent. Blood pools in the thoracic cavity and the body perceives an increase in venous volume; this triggers central blood volume receptors that generate a reduction in antidiuretic hormone secretion and a loss of water and sodium. During periods of inactivity, hemoglobin and hematocrit values may initially rise with the corresponding fall in plasma volume, but they fall dramatically during recovery and resumption of activity. This situation may lead to unnecessary treatment of anemia. The heart becomes weaker with immobility and may exacerbate comorbid conditions.[2] From the pulmonary perspective, immobility may further reduce ventilation by preventing full thoracic expansion. Further, immobility contributes to pulmonary complications, such as: atelectasis or pneumonia, and exacerbates pre-existing conditions. Prolonged immobility increases the risk for thromboembolism. [3, 4]

The flexible parts of the body such as joints, tendons, ligaments and muscles are designed to move freely and often in order to function properly. Contractures can develop within eight hours. Further, bone tissue is a dynamic structure. When a person becomes immobile, bones begin to lose calcium, which becomes apparent through increased levels of calcium in the urine.[5] This process can lead to a loss of 1.5 grams of calcium per week and increases the risk of renal calculi and calcification in the tissues. Individuals confined to bed for three weeks double the risk for hip fracture because of changes in the bone and balance issues.[6]

In the presence of immobility, the skin, considered the largest organ of the body, is at risk for decreased sensation, dryness, pruritis, compromised turgor, intertigo, and infection. Pressure ulcers may develop over any area of prolonged pressure, shear, friction or moisture. These areas include, but are not limited to: ears, shoulders, elbows, sacrum, buttocks, hips, heels, ankles, and toes.[7] Emotional changes such as depression, anger, despair or feelings of helplessness can emerge from social isolation related to immobility and deconditioning. Many healthcare recipients complain of changes in sleeping patterns. The physiologic effects of immobility are unchanged throughout history, yet sicker more complex healthcare recipients are at greater risk for these costly, predictable and preventable consequences of care.

Mobility has both an early and progressive component.

Early mobility involves the practice of passive and active range of motion, as well as advanced technologies (beds and lifts) to mobilize and ambulate healthcare recipients sooner and safer. Historically we believed that bed rest was the best thing for our critically ill patients. The complications of immobility have been identified in several studies and proven to negatively impact patient recovery in both the short and long term as well as return to baseline abilities to perform activities of daily living.

Progressive mobility is a stepped approach that allows the healthcare recipient to regain baseline mobility function while in the very early phase of hospitalization and treatment. In order to initiate the progressive mobility practice the healthcare worker must have knowledge of the healthcare recipient's current mobility status and challenges such as hemodynamic instability, increased intra-cranial pressure, multiple trauma/fractures, unstable spine or other exclusion criteria that impact the healthcare recipient's ability to proceed through the progressive steps in the protocol. The progression of activities begins with elevating the head in a 30-45 degree angle in order to prevent aspiration and promote physiological adaptation to the upright position. As the healthcare recipient adapts to the upright in bed positioning, the healthcare worker should proceed to turning the healthcare recipient from side to side to promote off loading, prevent pressure, and facilitate moving lung and bronchial secretions. During this time the healthcare worker will initiate passive and active range of motion exercises to prevent contractures, DVT, and muscle wasting. As the healthcare recipient shows signs of tolerating these activities the healthcare worker will proceed with tilt table positioning followed by bed side dangling, out of bed chair sitting and ambulation activities. When these activities are coupled with bed and lift technology the healthcare recipient and healthcare worker benefit as the therapies can be accomplished in a safer, more efficient practice than ever before.

Business case and return on investment

Several studies have cited the benefits of early and progressive mobility treatment plans for healthcare recipients. In 2012 one such study demonstrated how the use of a mobility protocol, combined with mobility technology, and an education model they were able to achieve a 300% increase in the mobility levels of their neuro-intensive care patients (viii). In this study the facility was also able to reduce length of stay (LOS) in the intensive care unit (ICU) by 13%, going from 12 days to 8.6 days average LOS. See Table 1.

The financial Impact of such can be estimated using conservative figures as follows:

Cost of ICU/day = $3000

Annual admissions to ICU = 500

$3000 X 500 =$1,500,000

If you reduce your LOS by one day for each patient you will achieve a cost savings of 1.5 million dollars.

Table 1

Physical Therapy: Perspective and Influence

Safely mobilizing a healthcare recipient can be different than just safely handling a healthcare recipient. Handling implies that the person is more of a passive participant that is being moved by someone else. Mobilizing is associated more with walking, transferring or exercising with a healthcare recipient. Most people associate these activities as signs of improvement.

Improving patient mobility is one of the primary objectives of physical therapy treatment. As stated earlier in this paper, immobility has many potential detrimental effects on healthcare recipients. Therapists are very aware of the effects immobility has on a patient. They know that positive outcomes depend on getting their patient moving as soon as possible. Physical therapists are involved in high risk patient mobility tasks on a daily basis. These tasks include transfer training, gait training and assisting patients with exercises. Therapists may be required to help lift a patient into a standing position or maintain an awkward posture in order to help advance a patient's leg during gait training. Therapists often put their own safety in jeopardy in order to mobilize their patients. Utilizing SPHM technology can potentially help improve patient mobility as well as help a therapist avoid injury. Historically, physical therapists have been slow to adopt the use of SPHM technology for therapeutic interventions. Most therapists look at a lift and see it as a passive lifting device, not as potential patient mobility tool. Many therapists feel the use of such equipment will "interfere with the rehabilitative process"[8] , but according to the latest study by Campo et al "SPH programs do not appear to inhibit recovery".[9]

Therapists will cite their advanced knowledge of body mechanics and manual patient handling skills as reasons why they don't need to use SPHM technology to keep themselves and their patient safe from injury, but research has shown that this type of reasoning may be flawed. The Bureau of Labor and Statistics reported in 2004 that 59% of all injuries to physical therapist were due to patient care activities.[10] Maintaining the safety of patients as well as healthcare workers should always be the primary goal in treatment. Therefore it is important that physical therapists join other health care professionals in adopting the SPHM standards.

The following case study is an example of how physical therapists, who have been trained on SPHM principles, using SPHM technology, are promoting a culture of safety.

Case study 1- Example of early mobility therapy and positive patient outcomes

Case Description: The patient was a 42 year old male, 6'5" and 300lbs, diagnosed with West Nile virus and hospitalized at a Midwest Level 1 trauma center for three weeks. During his stay he sat on the edge of the bed a few times unsupported but only for a few minutes. Following initial care he was transferred to another Midwest facility for his Inpatient Rehabilitation therapy where he stayed an additional three weeks. At this point the patient had not stood since his hospital admission; prior to admission he was independent in all mobility aspects and wanted to return to prior level of function as soon as possible.

Outcome: The care staff used mobile (floor) lift equipment early on for transfers from bed to chair; PT used the lift and lifting pants for standing in the parallel bars for safety due to patients weakness and size. The care team was able to stand the patient at the bed side using the lift pants before attempting to ambulate with the use of a walker. Even as he got stronger toward the end of his stay, the team used the lift pants with ambulation since he was still very shaky and being a larger person would be risking patient and staff safety without the SPHM technology. The lift pants were also used with the patient for the first weeks when trialling stairs and gait on the treadmill. SPHM technology was used every day for the first 75% of his rehab stay, initially to help lift him and then to serve as a safety net for the patient and staff as a modality to challenge his strength and balance without compromising safety. The patient returned home after approximately six weeks of being hospitalized and with the help of his wife he has returned back to his normal activities of daily living.

Case Study #2 - Example of early mobility with Physical Therapy intervention

Example of using a ceiling mounted lift (CML) in the treatment of a patient in order to improve patient mobility as well as decreasing the physical therapists fatigue levels.

Case Description: The patient was a 40 year old male admitted to an acute care hospital for medical management of an extensive CVA. Progressive mobilization was performed using both standard methods of patient handling and by using ceiling mounted lifts with slings. During all treatment, with and without the use of the CML, the patient's and the therapist's Rate of Perceived Exertion (RPE) were measured.

Outcome: Over the course of the patient's hospital stay, the patient progressed from ambulating 4 feet with maximum assist x 2 to ambulating over 200 feet with a wide based quad cane and supervision. The RPE for the patient ranged from 5 to 9 during treatment sessions. By varying the amount of the patient's own weight that he had to support by supporting him with the lift and sling, they were able to make it more or less difficult on him. When he was un-weighted by the lift, they could work more on the quality of his gait pattern.

During treatment sessions, the therapists RPE averaged 2 when the CML was used and averaged 5 when it was not used. Reducing the exertion levels by the therapist can lead to fewer work related injuries. Over exertion commonly leads to musculoskeletal injuries. In addition to working at lower exertion levels, the therapists also felt like they were able to perform more repetitions of gait training and exercises because both themselves and the patient were able to tolerate more activity when using the lifts and slings during treatment sessions. Performing more repetitions of a task can help improve and progress a patient's mobility.

Conclusion

As the science and research of patient handling and mobility continues to progress so will the technology that will allow the healthcare worker to provide a better quality of care that in turn will improve the outcomes of those they serve. These advancements will allow greater and greater independence for healthcare recipients as healthcare workers embrace these progressive mobility models; models that emphasize early and continuous mobility well beyond just basic patient handling. In addition to improving quality of care, healthcare workers will create a safer environment for both themselves as well as those they care for as they move away from the highly unpredictable and unsafe nature of manually handling the dependent healthcare recipient. This statement holds true for all care environments, across the care continuum, including acute care and the transition to long term care. As healthcare facilities embrace SPHM programs, financial benefits will include a reduction in the number of healthcare worker and healthcare recipient injuries, improved quality of care and improved healthcare recipient outcomes. The rehabilitative process is enhanced and often shortened by the use of SPHM technology that helps to stabilize and improve mobility of the patient during treatment when the patient may not be capable of any weight bearing activity.

The benefits related to SPHM can also cross over to some of the soft dollar issue and other intangibles, but no less important. When greater independence is restored or improved, it can improve the overall wellbeing and psychological disposition of the healthcare recipient. A reduction of fear and lowered anxiety related to falls is obtained and the healthcare recipient feels more at ease for multiple tasks that require their mobility. When people are moved manually, especially patients of size, there is often concerns related to dignity and embarrassment that can be reduced or eliminated with the usage of mechanical assists and progressive mobility models. All of these factors, when addressed appropriately, can improve the overall quality of care and the outcome of the healthcare recipient.

ASPHP and ANA have historically supported national safe patient handling legislation. Current legislation includes, H.R. 2480, the "Nurse and Healthcare worker Protection Act of 2013" which is to "direct the Secretary of Labor to issue an occupational safety and health standard to reduce injuries to patients, nurses, and all other healthcare workers by establishing a safe patient handling, mobility, and injury prevention standard." It further declares, "The standard shall apply to all health care employers, shall generally align with interprofessional national safe patient handling, mobility, and injury prevention standards. However, even if not passed in this Congressional session, the new focus of the bill has already begun to shift the focus of SPHM nationwide. National, state, and local organizations have begun to recognize this paradigm shift and are adopting the new terminology and beginning to implement the SPHM standards.

The Association of Safe Patient Handling Professionals (ASPHP) states in its Mission statement; "To improve the safety of healthcare workers and their patients by advancing the science and practice of safe patient handling." They not only support additional and ongoing research, but the implementation of this research into every day common practice by all healthcare workers. This happens through a culture of safety for healthcare workers and healthcare recipients. This includes the need for a strong SPHM program, the incorporation of ergonomic design principles, the correct selection, installation and maintenance of SPHM technology, a system for education, training, and maintaining competence, patient centered assessment and plan of care, and a comprehensive evolution system. This must be put in place for the safety and care of not only the healthcare workers, but also their patients. This must take place at all levels along the care continuum and at all levels of facility staffing, from front line healthcare workers and ancillary support staff to top level administration to be most effective.

In the early days of patient handling, movement was a key factor. In other words, healthcare workers were mainly focused on moving healthcare recipients from point A to point B quickly and efficiently. Today, mobility goes well beyond the earlier concept of just movement. It brings together stakeholders from all aspects of care, safety, quality, design, insurance, regulatory, administration, etc. It places patient handling and mobility as a fundamental part of a quality healthcare system and essential to achieving the best possible outcomes for both the healthcare recipients and healthcare workers. This is why the ASPHP supports the SPHM standards and the use and application of the term "Mobility" applied to patient handling.

Disclosure Statement

The ANA and the ASPHP do not endorse, promote, or recommend any specific product or services. The authors of this white paper are all members in good standing with the ASPHP:

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