



Interface

a common boundary between systems,
equipment, concepts, and human beings

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INTRODUCTION Jeremy Chingo Harris, Chair, Ergonomics Branch

Welcome to another great issue of *Interface*. The Ergonomics Branch leadership team is working behind the scenes to get us ready to apply with ASSE to become the Ergonomics Practice Specialty. We are very close to being ready, and we need your help! Branch membership needs to reach 500, but we seem to have peaked at 360. Tell your friends about us! Tell your colleagues! If you refer someone who is not already a member, you could win a trip to Safety 2011 in Chicago, IL. [Click here](#) for more information.

We can also use your help in writing newsletter articles. You may have noticed that our newsletter is largely comprised of articles from the same few individuals. Anyone is welcome to submit articles. What are your experiences in ergonomics? What is working for you? What is not working so well? We want to hear from you!

Lastly, registration for Safety 2010 is now open. Join us June 13-16 in Baltimore, MD for a great professional development conference! This year, there will be 11 concurrent sessions in the ergonomics track, including the six sessions noted below, which are sponsored by the Ergonomics Branch. You will also have the opportunity to meet your leadership team during our meet and greet. Details will follow. Are you in?

Ergonomics Track

Monday, June 13, 10:45-11:45 am

503 Productivity & Injury Risk Improvements at a Mail & Distribution Center
Deborah Read, MOTR/L, ErgoFit Consulting, Inc., Seattle, WA

Monday, June 13, 3:15-4:15 pm

529 Optimizing and Designing for an Aging Population in the Workplace
Winnie Ip, CPE, Humantech, Ann Arbor, MI



Monday, June 13, 4:30-5:30 pm

554 Ergonomics Solutions for Women in the Workforce
Ronald W. Porter, PT, CEAS, Back School of Atlanta, Atlanta, GA

Tuesday, June 13, 3:00-4:15 pm

652 AERAT: Agricultural Ergonomics Risk Assessment Tool
Lawrence J. H. Schulze, Ph.D., P.E., CPE, University of Houston, Department of Industrial Engineering, Houston, TX

Wednesday, June 14, 9:15-10:30 am

704 Ergonomics Processes that Get Results: Benchmarking from the Industry Leaders
Walter G. Rostykus, CSP, CIH, CPE, Humantech, Inc., Ann Arbor, MI

Wednesday, June 14, 1:45-3:00pm

765 Transportation Ergonomics: Factors Leading to Discomfort and Injury
David M. Brodie, CPE, Atlas Ergonomics, LLC, Hendersonville, NC

ErgoARTICLE Danielle Geissler, Ph.D., Kristen Rost, M.S. & Alicia M. Alvero, Ph.D.

A Multidisciplinary Approach to Preventing Work-Related Musculoskeletal Disorders

Individuals who engage in prolonged computer use are at particular risk for developing work-related musculoskeletal disorders (WMSDs), and the number of employees relying on computers at work is rising steadily (Pascarelli & Hsu, 2001). Various interventions have addressed WMSDs, with the ergonomics field at the forefront of these developments. The behavioral safety field has also addressed the development of WMSDs in computer users.

What is Behavioral Safety & Why Use It?

Behavioral safety is a systematic approach for reducing workplace injuries and illnesses using the principles of applied behavior analysis. Behavioral safety techniques used to address WMSDs include performance feedback (providing information about one's behavior), peer safety observations (the observation and evaluation of others' behavior) and self-monitoring (the observation and evaluation of one's own behavior) (Gravina, Austin, Schoedtder & Loewy, 2008; Sasson & Austin, 2005; Sigurdsson & Austin, 2008). An ergonomic workstation allows employees to assume a neutral position while working in the absence of excessive impact on joints, tendons, muscles, nerves, spinal discs or ligaments and maintain high productivity. To complement this, behavioral safety techniques can provide the ongoing support needed to maintain safe working postures overtime (Culig, Dickinson, Lindstrom-Hazel & Austin, 2008).

Gravina, Lindstrom-Hazel and Austin (2007) provide an example of a combined ergonomic and behavioral safety approach. Researchers conducted a study with office workers in a university library to increase safe posture while typing. The researchers found that workstation adjustments and a roller mouse keyboard increased safety performance across most postural responses. However, pairing workstation changes with a behavioral intervention (i.e., peer safety observations and performance feedback) increased safety performance to substantially higher levels.



A Multidisciplinary Approach to Preventing Work-Related Musculoskeletal Disorders (con't)

Using workstation adjustment, live snapshot feedback self-monitoring to improve posture.

Geissler, Rost and Alvero used a combined approach to investigate: a) whether an office workstation setup according to OSHA standards would suffice to elicit safe typing posture in participants, b) whether the addition of video-based feedback would enhance postural safety and c) whether the addition of a self-monitoring would further increase safety.

Participants and setting. Six students from a northeastern university participated in the study. The study was conducted in a simulated office that was furnished with a chair, desk and desktop computer.

Safety performance measures. Six postural responses were measured based on OSHA guidelines (OSHA, 2008): 1) head/neck, 2) back, 3) arms, 4) wrists, 5) legs and 6) feet. Performance was recorded with a camera during each session and later evaluated by the researchers.

Phase 1: Workstation adjustment. The workstation was adjusted for each participant as defined by OSHA standards on ergonomically correct workstation setups (OSHA, 2008).

Phase 2: Snapshot feedback. Individual snapshots of momentary safety performance (snapshot feedback) were presented to the participants. A momentary snapshot was taken from each participant's live video feed and was presented on the computer monitor.

Phase 3: Snapshot feedback plus self-monitoring. The third phase was designed to assess whether snapshot feedback paired with self-monitoring could further improve safety performance. Self-monitoring required participants to answer a set of questions in a popup window appearing next to the live snapshot. Participants were asked "Are/Is your _____ safe in this picture?" for each postural target. To the left of each question, participants were then asked to check a box with three possible answers (yes, no, uncertain).

Results. Safety performance improved from Phase 1 (workstation adjustment) to Phase 2 (snapshot feedback) for most postural targets. However, the addition of the self-monitoring component led to a slight decrease in mean safety performance across most postural targets. Effect sizes (Cohen's *d*) were calculated by contrasting performance across the three phases of the study. Results of the effect size analyses comparing Phase 1 (workstation adjustment) with Phase 2 (snapshot feedback) were large (above 0.8) for five out of six targets (head/neck, back, legs and feet) and low (below 0.5) for arms.

Conclusions and practical implications. The study conducted by Geissler, Rost and Alvero provides another good example of the use of behavioral supports to compliment optimal workstation adjustments. Future evaluations of the application of video-based feedback in the area of postural safety should investigate the role of feedback duration, placement, frequency and saliency on safety performance. Studies should include computer users in real work settings and may extend the current application to include laptop users as well.

Ergonomic and behavioral safety strategies have both been linked to the control of WMSDs. The research presented here supports a multidisciplinary approach to WMSD prevention that includes a thorough evaluation of the workplace conditions and behaviors that impact safety, the implementation of changes to the work environment that impede safe performance and the introduction of behavioral supports to maintain safe performance over time.



A Multidisciplinary Approach to Preventing Work-Related Musculoskeletal Disorders (con't)

For more details about the research presented in this article, please contact Danielle Geissler at danielletittelbach@hotmail.com.

ErgoARTICLE Jeff Sanford, CPE, & Kent Hatcher, CPE, Humantech Inc. **Ergonomic Risk Prevention Through Design**

ASSE recently released the technical report, "Prevention through Design (PtD): Guidelines for Addressing Occupational Risks in Design and Redesign Processes" (TR-Z790.001-2009). During the design phase is the best opportunity to eliminate the introduction of risk factors, which contribute to musculoskeletal disorders. We are frequently asked how to build this review process into new or existing ergonomic improvement processes. Two foundation steps are outlined below.

Build Ergonomics into the Product Design Process

"Validating that a product is designed with solid ergonomic attributes can be completed at many steps of the product development lifecycle," notes Jeff Sanford, Managing Consultant at Humantech. Efficiencies are seen when these reviews are completed earlier in the process but keep in mind that a product can be approved as "ergonomic" at any step. The fact that a product provides an ergonomic advantage for the end user is important for various reasons: marketing, our aging population and because the customer will like using the product. Ease of use is a key factor in customer satisfaction.

There are three general stages in a product design/lifecycle when ergonomic design principles can be introduced. Following is a quick description of those stages, along with key activities required to ensure that ergonomic design criteria are upheld.

1. Pre-Design. This creative phase is really generating the concept for the product. Modeling or sketches will be created with definition of function the main goal of this phase.

Key Activities: Designers must be aware of or trained in ergonomic design principles. Without this knowledge, the design will be what the team thinks is right, and that type of vague approach will not result in a solid design from an ergonomics perspective.

2. Design Gate Reviews. In most design processes, "gates" are passed through as the product design is finalized. The gate review process confirms that every aspect of the product is designed according to plan and allows for an iterative design process.

Key Activities: This is a go or no-go situation and typically is governed by a subject matter expert in ergonomic design principles and/or human factors design. Integrating ergonomics during this phase allows the subject matter expert to provide input at appropriate phases in the launch process. The designs will be tested using methods like end-user testing, objective measurement of the efforts to use the product and fatigue analysis. If the product has been designed in accordance with the accepted ergonomic design guidelines, the design passes through the gate, if not, the design team will reevaluate the design.



Ergonomic Risk Prevention Through Design (con't)

3. Post-Design. Once a product has been approved for build and the design is “frozen”, there is still an opportunity to validate the product’s design.

Key Activities: This requires a product review to determine if the design meets ergonomic principles and is in accordance with accepted ergonomic design guidelines. The designs will be tested using the methods mentioned above. The outcome of this review is a statement defining which aspects of the product are within guidelines and which aspects need improvement. These improvements can either be implemented immediately, if feasible, or they can be integrated into the next generation of the product.

Making unfounded claims that a product is ergonomic is common, and unfortunately, this hurts the field’s credibility. This happens because no design standard exists for which to compare a product’s attributes. However, industry-accepted guidelines exist that, when implemented, will improve the product’s usability.

Use Ergonomic Design Criteria to Drive Down Risk

“Many people attending my workshops are surprised when I mention that responsibility for ergonomics should fall under the engineering department rather than the safety department,” says Kent Hatcher, CPE, Managing Consultant at Humantech. Poor safety performance is a consequence of engineering design that failed to fully consider human interaction in the system. Engineers play a critical role in proactively designing jobs and equipment with low ergonomic risk, as well as reactively reducing existing exposures in the workplace. Therefore, to not have site engineers participate in your site ergonomics initiative puts you at an immediate disadvantage.

Obtaining full engineering support is another story. Everyone is stretched to the max these days, so anything that is perceived as more work will likely become low-priority. Site engineers must understand that including basic ergonomic design principles in their project plans does not really take extra time and effort. In fact, it often ends up saving time in the future.

The best strategy for getting site engineers onboard is to translate safety and ergonomics into a language they understand. To do this:

- **Use a data-driven approach.** What is measured is managed, and you need an ergonomics risk assessment method that allows you to score workstations or work processes quantitatively (i.e., high, medium or low risk). Without knowing where your hot spots are, how can you be sure you are addressing the right problems? Quantitative risk assessments will allow you to prioritize issues for improvement and will give your engineers the feeling of making a contribution toward risk reduction in your facility.
- **Define specific ergonomic design criteria.** Let’s deal with numbers and design rules. Eliminate the type of language that says “lower the cycle button” or “raise the shelf”. Engineers design to specifications (e.g., material handling heights should be no lower than 22" and no higher than 49"), so give them design specifications for human performance. These specifications are based on anthropometry (the study of the measurement of people) and may include categories, such as workstations, manual material handling, hand tools, controls and displays and environmental factors, among others.



Ergonomic Risk Prevention Through Design (con't)

In summary, a successful ergonomics initiative cannot function effectively without participation from many different groups within your facility, but particularly your engineering group. Incorporating techniques like building ergonomics into product design and enabling engineers to integrate ergonomics into their daily responsibilities will make your overall risk reduction efforts more successful.

ErgoARTICLE David W. Bartko, M.S., CSP, Kris Hamann, M.B.A, & Lori Severson, M.S., HEM

Developing a Safe Patient-Handling Program for Long-Term Care: A Case Study

The European, Australian and Canadian healthcare systems have led a revolutionary change in the way patients and residents are lifted and transferred within their facilities by successful implementation of a comprehensive patient-handling program that includes ergonomic assessments, lifting equipment and administrative controls (Nelson, 2006). In recent years, the U.S. healthcare industry has openly begun to acknowledge that manually lifting, repositioning and transferring dependent patients and long-term care residents are high-risk activities, both for the caregiver and for the patient or resident.

Moving dependant people on a daily basis is identifiably dangerous work. The cumulative weight lifted by a single nurse in one typical 8-hour shift has been estimated at 1.8 tons, or 9 tons for a 40-hour work week (Nelson, 2006). The nursing occupation has one of the highest incidences of work-related injuries of all occupations.

In 2007, 8.4 injury and illness cases occurred per 100 full-time workers in skilled nursing and personal care facilities compared to 4.4 per 100 for private industry. The lost workday injury and illness rate for skilled nursing and personal care facilities at 5.2 per 100 exceeded some of the traditionally more hazardous occupations, such as construction (4.7 per 100) and agriculture (5.0 per 100) (BLS, 2007).

Direct and indirect costs associated with back injuries are estimated to be more than \$100 billion annually, with \$30 billion attributed to the healthcare industry. More than three quarters of a million working days are lost annually as a result of back injuries in nursing, with an estimated 40,000 nurses reporting illnesses from back pain each year (Nelson, 2006; BLS, 2007).

Caregivers in hospitals and skilled care nursing facilities risk serious injury every time they help transfer, move or reposition a patient or resident. Most of these injuries are strains and sprains caused by patient or resident handling care tasks, and 50% are related to the back. In a recent study, more than 50% of nurses reported job-related musculoskeletal pain (Nelson, 2007).

Traditionally, the response to patient-handling injuries has been to provide training to caregivers on body mechanics and proper lifting techniques and to identify patients or residents that would require a "2-person" transfer or lift, thinking the 2 caregivers would share the weight equally, thereby reducing the risk. These approaches do not reduce the risk of injury to caregivers. Evidence-based studies show that shear forces on the spine during both 1- and 2-person transfers and lifts measure above tolerance limits and conclude that patient-handling tasks are extremely high-risk for injury (Marras, 1999).



Developing a Safe Patient-Handling Program (con't)

High-risk tasks are defined as duties imposing significant biomechanical and postural stresses on the care provider. In addition to patient transfers and lifts, other identified high-risk tasks in healthcare include repositioning a patient in bed or chair, applying antiembolism stockings and transporting a patient in a bed or stretcher (Nelson, 2006).

NIOSH estimates that the average person can safely lift 51 pounds. While proper body mechanics and lifting technique are important elements in reducing back stress, no amount of training or technique can make safe a task that is inherently unsafe. Strategic interventions are needed to control the hazards and financial burden associated with patient-handling tasks and to retain qualified staffing levels to meet the anticipated demand in the next half-century.

Recent studies show that safe patient-handling (SPH) programs can be highly effective in reducing the frequency, severity and costs of caregiver injuries. And when nursing injuries are reduced and nurse-to-patient time is increased, patient outcomes improve (Collins, 2004; Nelson, 2006).

The American Nursing Association (ANA) and the Veterans Health Administration (VHA) have been early leaders in promoting SPH efforts in the U.S. ANA developed its "Handle with Care" program, which provides materials and support for safe practices for patient-handling. VHA was one of the first organizations to implement SPH programs and to formally publish evidenced-based results, which included nursing injury reductions and improved patient outcomes, including higher alertness, lower fall risk and declines in pain and combativeness (Nelson, 2007).

Long-Term Care Industry

Skilled nursing facilities (nursing homes) are one of the fastest-growing industries in the U.S. More than 1.6 million nursing home employees work in 21,000+ facilities (Rhodes, 2001). A skilled nursing facility is defined as an establishment, which is primarily engaged in providing skilled nursing care and related services for residents who require medical or nursing care or rehabilitation services. Skilled nursing facilities offer the highest level of long-term care and are characterized primarily by the patient or resident need for 24-hour nursing care.

Unlike hospital (acute care) settings where physicians direct most care, paraprofessional caregivers (RNs, LPNs, CNAs, NAs) are the dominant caregiver in long-term care settings. It is estimated that more than 90% of the care and handling of physically dependant patients is performed by women (Nelson, 2007). The risk of worker injury has been consistently higher in long-term care facilities than in hospitals, primarily because long-term care residents require a higher burden of daily care, such as getting in and out of beds or chairs, dressing, bathing and toileting. In addition, fewer staff per residents are usually available in a long-term care facility, which consequently increases the patient-handling exposure for individual workers (Nelson, 2006).

Staffing is an issue that must be considered. As the "baby boom" generation (those born from 1943-1963) ages, the size of the elderly population will increase. By 2050, it is estimated that between 5.7 and 6.5 million long-term care workers will be needed to meet the healthcare needs of the 27 million baby boomers—a 250% increase from the 2000 level (Stone, 2000; DHHS, 2003).

Another factor affecting the future availability of long-term care (frontline) workers is that post-baby-boom generations are considerably smaller. As baby boomers reach retirement age over the next two decades, the number of available employees between the ages of 25 to 54 years of age (who traditionally provide care) will be substantially smaller. The ratio of direct-care workers to the dependant population will be higher than ever. Fewer employees will be available to take care of more people (Stone, 2001; DHHS, 2003).



Developing a Safe Patient-Handling Program (con't)

Safe working conditions will play a key role in retaining and attracting new workers. While federal and state government will have a role to play, the bulk of responsibility will fall on industry shoulders. Employers will need to alter the healthcare market by improving patient-handling methods and by shaping new solutions using available technologies. For their part, employees at all levels will need to embrace the new technologies and change. Strong evidence already supports the effectiveness of four interventions: SPH policies, mechanical equipment, ergonomic assessments and lift teams (Nelson, 2006).

Safe Patient-Handling (SPH) Legislation

While federal legislation has been introduced, states have taken the lead in passing legislation regarding patient or resident handling requirements. Below is a brief overview of state, federal and Minnesota-specific legislative actions to date.

State Legislation

Texas passed the first state law requiring hospitals and nursing homes to implement SPH and movement programs as of January 1, 2006. Currently, nine states have passed legislation pertaining in some way to safe patient and/or resident handling. Six states directly require development of safe patient-handling programs and/or demand the use of mechanical patient lifting equipment. Three other states support and encourage efforts for safe patient and/or resident handling.

Texas (January 2006), Washington (March 2006), Rhode Island (July 2006), Maryland (April 2007), Minnesota (May 2007) and New Jersey (January 2008) have all passed legislation requiring safe patient and/or resident handling policies and/or programs and/or lifting equipment, with much variation in scope and strength among the different state laws.

Ohio, New York and Hawaii have passed legislation, which does not directly require, but is supportive of, safe patient and/or resident handling. Ohio offers interest-free loans to nursing homes wishing to implement lift equipment. New York commissioned a study on SPH with a goal to create best practices. Hawaii adopted a resolution supporting ANA's "Handle With Care" program.

Federal Legislation

In January 2007, Representative John Conyers (D-MI) introduced H.R. 378: Nurse and Patient Safety and Protection Act. If approved into legislation, this bill would direct the Secretary of Labor to issue an occupational safety and health standard to reduce injuries to patients, direct-care registered nurses and other healthcare providers by establishing a safe patient-handling standard (Govtrack, 2007)

If H.R. 378 is successful, the federal SPH standard will require all healthcare facilities to comply with requirements "to prevent musculoskeletal disorders for direct-care registered nurses and other healthcare providers working in healthcare facilities. The standard requires the elimination of manual lifting of patients by direct-care registered nurses and other healthcare providers through the use of mechanical devices, except during a declared state of emergency." In May 2007, the bill was referred to the Subcommittee on Workforce Protections.

Minnesota Legislation

On May 25, 2007, legislation was enacted in Minnesota requiring all licensed healthcare facilities in the state to implement an SPH program. The program required adopting a written SPH policy and establishing an SPH committee by July 1, 2008. The policy must also establish a plan to minimize manual lifting of patients and residents by January 1, 2011 through the use of SPH equipment.



Developing a Safe Patient-Handling Program (con't)

The SPH program must also address:

- Assessment of hazards with regard to patient-handling;
- Acquisition of an adequate supply of appropriate SPH equipment;
- Initial and ongoing training of nurses and other direct patient care workers on the proper use of this equipment;
- Procedures to ensure that physical plant modifications and major construction projects are consistent with program goals; and
- Periodic evaluations of the SPH program.

A unique aspect of Minnesota SPH legislation is that it applies to all “licensed healthcare facilities,” which by definition includes all acute and long-term care facilities in the state. Another unique aspect of Minnesota’s SPH legislation was a one-time available grant sum of \$500,000, which was divided among 68 acute and long-term care facilities in Minnesota. Grants were awarded based on quality of the written grant application. Of the initial 68 grants, eight were awarded to Essentia Health facilities totaling \$62,000.

Case Study: Essentia Health/Benedictine Health System

Background

Essentia Health, an affiliation of St. Mary’s Duluth Clinics (SMDC) Health System, Innovis Health, Benedictine Health System (BHS) and Essentia Community Hospitals and Clinics (ECHC), is a multistate, not-for-profit healthcare system headquartered in Minnesota. Essentia Health’s mission is to support their communities in the development and delivery of the highest quality healthcare for life.

Essentia Health’s core values are hospitality, stewardship, respect, justice, quality and teamwork. Essentia Health employs approximately 12,000 staff members and has net operating revenue of approximately \$1 billion per year.

In April 2004, 26 BHS facilities became self-insured under a captive insurance program named the Benedictine Groups Self Insurance Association (BGSIA). Cost containment was imperative as skilled nursing facilities experience, at best, a 1%-3% profit margin. BGSIA incurred \$5.3 million in workers’ compensation claim costs (undeveloped) from April 2004 to August 2008. Approximately 75% of claims and \$4 million of total incurred dollars were related to patient-handling. Nursing, strains/sprains and patient-handling tasks were identified as top workers’ compensation loss trends.

In September 2004, BHS established a safety and workers’ compensation steering committee. Committee members were comprised of facility representatives and outside consultants. The committee’s purpose was to provide oversight to the loss prevention, claims management and SPH programs. As a result, a five-year strategic plan was put in place to reach these targeted objectives:

- Reduce direct-care staff SPH-related injuries and associated workers’ compensation costs;
- Educate steering committee members by attending the safe patient-handling and movement (SPHM) conference;
- Establish a pilot project. Steering committee directed a CEO and regional physical therapy director to implement an SPH program in two facilities; and
- Develop and deploy a comprehensive SPH implementation process to all BHS skilled nursing facilities.



Developing a Safe Patient-Handling Program (con't)

SPH Pilot Site: Saint Anne of Winona

Saint Anne of Winona operates in four distinct divisions; Saint Anne Extended Healthcare (skilled nursing), Callista Court (assisted living apartments), Benedictine Adult Day Center (licensed adult daycare programs) and Saint Anne Training Center (federal- and state-approved training of nursing assistants).

The SPHM pilot program took place at Saint Anne Extended Healthcare, which is a four-story skilled nursing facility with 109 private rooms. Saint Anne was chosen for the pilot because the administrator and physical therapist were members of the BHS steering committee, were the first to attend the SPHM conference and were key supporters of incorporating these programs into the organization. The Saint Anne facility was also a good choice because it had a high frequency and severity rate among the highest workers' compensation costs within the BHS organization.

SPH Pilot Implementation Steps

Major steps taken included:

- Sent the CEO and regional PT director to the SPHM conference in Florida;
- CEO returned and implemented SPH program and began raising funds totaling approximately \$73,782 in 2005 through donations and grants.
- Reviewed SPH equipment vendors, submitted requests for proposals;
- Selected an equipment vendor;
- Initially installed ceiling systems in resident rooms (straight rail from bed to bathrooms) and a therapy ceiling track system on the fourth floor and the therapy department;
- Since 2005 to present, they have covered 46 of their 109 beds with ceiling systems in resident rooms, all financed by foundation donations and grants.

SPH Pilot Results

The Saint Anne facility has experienced an 80% reduction in total incurred workers' compensation costs comparing 2004 (SPH-related incidents to direct-care staff only) to 2008 (\$165,000 in 2004 compared to \$34,155 total incurred in 2008).

More work is needed. There is need for an SPHM culture change education program for staff. There is need for development of their SPHM assessment documentation and education on the use of SPH algorithms. There is need for further review of low-tech devices to assist staff in the many repositioning tasks and turning tasks performed in skilled care facilities. Until these items are addressed, this is not considered a complete success story but one well on its way.

SPH Program Approval: Executive Management

The BHS steering committee realized nurses were performing high-risk tasks and that body mechanics education and gait belts did not stop work-related patient-handling injuries. The initial success and feedback from the Saint Anne pilot project convinced the team to implement SPH across the entire system. This was seen as a critical need, and the size and commitment of such an initiative would require executive management support.



Developing a Safe Patient-Handling Program (con't)

In 2007, the steering committee submitted an SPH implementation proposal to the BHS executive management committee (EMC) to obtain endorsement for implementing SPH programs in all BHS facilities. The proposal included data on nursing staff injury rates, injury costs and the impact on revenue, and nursing turnover rates. It also included a video testimonial from an injured nurse assistant at the pilot location who, after an SPH-related back injury, could no longer do the job she loved—nursing.

EMC approval was given, and the charge was to implement SPH throughout the BHS system. EMC established SPH as a CEO/administrator performance expectation. Developing an SPH implementation guide, conducting education and training and helping to attain funding for equipment would be the steering committee's primary focus.

SPH Program Funding

The Saint Anne pilot project financed ceiling lift installs and other SPH equipment purchases through grants, private donations and BHS foundation donations.

In 2007, the steering committee submitted to the Minnesota Department of Human Services (DHS) a Pay for Performance grant proposal. The grant's goal was to improve resident care and to help employees by installing SPH equipment. The DHS pay for performance grant program awards employers who can show technology improves healthcare.

In April 2008, BHS was awarded a 12-facility collaborative Pay for Performance award from Minnesota DHS worth \$1.9 million. The proposed project established that 12 skilled nursing facilities working collaboratively could establish baseline SPH metrics and after installing ceiling lifts in resident rooms covering 250 resident beds, that they would as a group see decreases of 20% of lost-time incidents and lost-time days of OSHA-recordable, SPH-related incidents.

A metric on resident satisfaction is also related to their comfort, and the project proposes a 3% improvement in resident satisfaction in comfort from the baseline after being cared for with ceiling lift technology.

The ceiling systems were installed in 12 Minnesota skilled nursing facilities in November and December 2008. After the systems were installed, the vendor provided hands-on skill training with the equipment and provided SPH culture change and teambuilding education. It was decided that implementing SPH was more than just learning how to use slings and ceiling lifts and much more about changing the culture. Each facility sent five employees to SPH culture change and teambuilding education sessions provided by nurses and physical therapist educators from the vendor. Workshops were train-the-trainer style sessions. The five team members from each facility were charged with returning to their facility and educating all of their staff.

The facilities began tracking their metrics February 1, 2009, and BHS completed the study February 1, 2010. If the project does not meet the goals established, we risk a 20% return of the \$1.9 million award to DHS. If the project does not meet the established goal, BHS must return 20% (\$380,000) of the \$1.9 million award to DHS.

Figure 1 outlines the BHS SPH funding organizations and the award amounts.



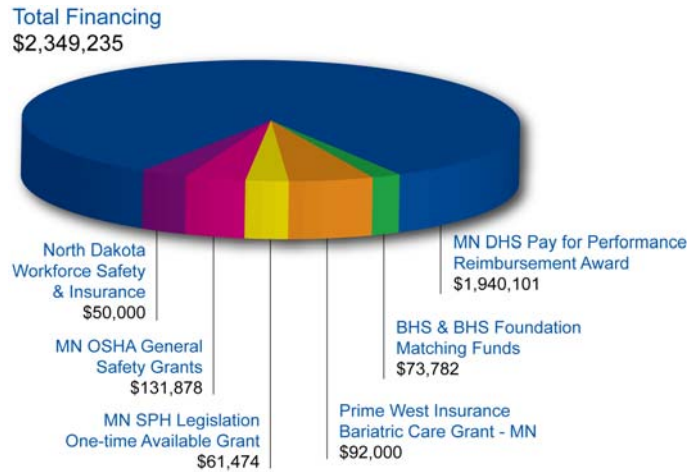


Figure 1. SPH funding organizations and amounts awarded.

SPH Program Implementation Guide

SPHM is an ergonomic approach emphasizing administrative and engineering controls in patient- or resident-handling activities. SPHM program involves changing the traditional way patient or resident handling is performed. An SPHM program's purpose is to reduce and eliminate injuries to caregivers during patient or resident transfer activities.

The BHS steering committee developed an SPH implementation guide that was distributed to all of their CEOs at a leadership meeting. EMC established the implementation of SPH as a CEO/administrator performance expectation.

Why & How the SPH Implementation Guide was Created

- Many facilities did not have a formal approach to SPH, and few employees had formal education on SPHM;
- Various levels of safety committee activity and involvement. Many times the facility safety committee focus was on patient or resident safety rather than on employee safety;
- A third-party administration loss control consultant drafted an SPH implementation guide;
- An internal BHS team consisting of an occupational therapist, a registered nurse consultant, the Essentia Health safety and workers' compensation administrator and the director of quality met and customized the SPH implementation guide.

A simple three-ring binder format was used. The binder included resources for an administrator, director of nursing and employee safety committee to help them begin to understand this subject and to be able to articulate the necessary SPHM program components needed to direct this change in their facilities. The binder was intended to be an education resource and administrative control measure, not a standalone solution to the SPHM implementation process.



Developing a Safe Patient-Handling Program (con't)

SPH Guide Sections	Contents/Description
Background to Safe Patient-Handling	Introduction; Why it is Important
What is Safe Patient-Handling?	Define SPH Risk and Controls
A Participatory Approach	Select Leader, Team, Vendor; Develop Policy
Cost-Benefit Analysis	Selling Management on Need, ROI, Funding
Appendix A	SPH Implementation Checklist
Appendix B	ROI Worksheet
Appendix C	Skills Observation Checklist
Appendix D	SPH Ergonomic Risk Assessment
Appendix E	SPH Equipment Considerations Checklist
Appendix F	Definitions
Appendix G	Additional Resources

Table 1. Outline of BHS SPH Implementation Guide.

Administrative Controls

As part of a comprehensive SPHM program, administrative controls should also be considered. Administrative controls are as essential as engineering controls to a successful SPHM program.

Examples of administrative controls include:

- Familiarizing employees with patient-handling guidelines and enforcing facility rules;
- Providing training in proper management techniques for supervisors and administrators;
- Assessing care plans and implementing procedures that reduce the need to manually lift, reposition or transfer the patient and communicating plans to staff;
- Conducting periodic audits by observing patient-handling techniques;
- Providing training in emergency procedures for residents who have fallen, have spasms, are combative or exhibit any unpredictable behavior.

Engineering Controls

Engineering controls are a major component of an SPHM program. Engineering controls prevent injuries by reducing the amount of weight lifted or by reducing risk factors for injury.





Photo 1. A room-traversing ceiling lift in operation.



Photo 2. A floor-based full lift and sling used to lift non weight-bearing patients and residents from surface to surface or from the floor after falls.





Photo 3. A powered sit-to-stand lift and sling used for weight-bearing patients who need assistance during surface-to-surface transfers.



Photo 4. Lateral transfer aides used to transfer dependent patient/resident from surface to surface with less friction and pull force required.



Photo 5. Repositioning aids include slide sheets, which reduce friction and are used to help the care provider boost, reposition or roll the patient/resident on the bed surface.



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Significant improvements have been made in patient-handling equipment. The awkward, difficult-to-use, chain-style lifts of the past have been replaced by more stable, easier-to-use, battery-operated lifts. And whereas portable lifts can be cumbersome, the new ceiling lift systems are available and may not require additional ceiling infrastructure for installation.

No set guidelines exist to determine the number of lifts or equipment a facility will need. Site management must assess the dependency level of the patients and residents requiring assistance, the building design, future growth and accessibility when determining equipment needs. In addition to patient-handling devices, other engineering controls that can reduce factors that can lead to injury include:

- Provide routine maintenance on all lift equipment, beds carts, wheels and brakes;
- Modify wheelchairs and shower chairs with removable arms;
- Correct uneven floor surfaces; and
- Slip sheet use.

While engineering controls will require an upfront investment, facility management must look beyond the initial costs of power lifts to consider long-term benefits of purchasing assistive equipment. In addition to the direct workers' compensation costs that can be saved, indirect costs, such as lost productivity, retraining, sick or administrative leave can be saved.

SPH Program Results & Next Steps

As with any new program development and roll-out, there were successes and barriers to overcome.

Successes

- Successfully gained executive management support and approval;
- Successfully educated skilled nursing facilities on how to manage workers' compensations claims better; focus is now on prevention of our most common type of injury;
- Developed knowledge on SPHM within the entire organization, but more is needed;
- Successfully financed the purchase and installation of 300+ ceiling systems through donations, grant writing and executive management approval of capital budget planning within the Essentia Health system in total.

Barriers

- Skilled care facilities are not educated in risk identification of SPHM tasks and educating staff on this risk is a huge endeavor;
- The implementation guide was lost. The guide was intended to get in the hands of the key players/correct people to help educate staff and implement the program. It was often lost and never seen by the directors of nursing or opened and read.
- VHA resources are wonderful, but the terminology was acute care language. Initial review of patient assessment and algorithms was not terminology used in skilled care in Minnesota. Nursing and PT teams edited these resources to match skilled care terminology, but more work is needed to actually incorporate it into everyday nursing documentation and education.

Next steps include overseeing the Pay for Performance project with oversight of the metrics in 2009. We want to share the results of this project with others in 2010. A collective improvement of 20% over baseline for all participating facilities in:



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1. OSHA 300 log-recordable SPH-related incidents.
2. OSHA 300 log lost-time days.
3. Collective average improvement of 3% on the 2009 Nursing Facility Quality of Life Resident Satisfaction Survey Score in the comfort domain.

Conclusion

SPH program implementation is easier said than done. Despite the positive evidence regarding SPH programs, reduced injuries and improved patient or resident outcomes, healthcare organizations and workers are slow to accept the change when it comes to patient handling. Nursing professionals are caregivers at heart and want to provide support, help and assistance to those in need. This care has historically been delivered through manual, hands-on techniques. Using equipment is initially considered impersonal and cold. Implementing SPH programs create change to the organizational and workplace culture and can prove to be a large hurdle—one that takes slow, steady progress.

Getting executive management approval does not mean the organization will immediately embrace the change. It is important to ensure that there is a designated SPH program leader/champion internal to the organization, designated SPH leaders at each location and informal leaders in each unit/wing/floor. It is equally important that SPH program activities become integrated into the program leader's formal job performance goals and annual review process because what gets measured gets managed. It is important for everyone to understand dedicated work hours must be carved out of bedside care and management duties to successfully implement and manage a comprehensive SPH program. It takes more than enthusiastic interest; it takes time.

Long-term care safety programs are not as developed as general industry, so as you implement this type of program, you must bring employees up a learning curve of safety, and there is always some resistance to change. Involve all nursing staff from the beginning to open the lines of communication and reduce the resistance to change. Those facilities that conduct equipment reviews, allow employees to “try before they buy” the equipment and provide their input into the final purchasing decision are much more successful than those that purchase blindly through preferred vendor purchasing programs directed by the purchasing department. A complete understanding of the equipment, prior to purchase, is important and will save your organization money and stress. SPH education and training is more than just the transfer of knowledge on skills on how to turn the equipment on. The organization must develop a culture that demands a new performance standard of care for moving patients/residents and yet encourages open discussion and learning from the mistakes and challenges of implementing such a program.

No safety and health program is complete without a continuous quality improvement (CQI) follow-up process performed on a regular basis. Baseline CQI audits have been performed on all Essentia Health facilities and will continue to be used to monitor their successes (or lack thereof). The audit findings push Essentia to act and support the Essentia Health business units. The corporate safety and workers' compensation team finds the resources to help locations break down barriers and to communicate successes to the highest executive levels as well. Essentia Health corporate oversight is a key component of how Essentia has moved and will continue to move the Essentia Health safety culture to a higher standard and how they will continue to successfully implement an SPHM program across its healthcare system.



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Though the focus of this safety initiative was on employee safety, Essentia Health is seeing a positive impact on patient and resident safety as well. They receive positive comments from residents being moved in newly acquired ceiling lifts. As part of the pay for performance project in 2009, residents will be formally surveyed using the Minnesota Department of Health's (DOH) Nursing Home Report Card—The Resident Satisfaction Survey Tool. DOH will focus specifically on the resident comfort domain questions to indicate changes from baseline in their perceptions of care after installing the ceiling track systems. Results will be communicated in our 2010 project results. The survey can be found at www.health.state.mn.us/nhreportcard/mn_survey_instrument.pdf.

Finally, budgeting will be critical to SPH program management, particularly in the current economy. Finding ways to fund the low- to high-tech equipment through annual capital budgets or more creatively through state and industry grants should be a key focus for the program leadership.

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