



***Testimony before the
Subcommittee on Employment and Workplace
Safety
Committee on Health, Education, Labor and
Pensions
United States Senate***

**Safe Patient Handling & Lifting Standards
for a Safer American Workforce**

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Madam Chair and Members of the Subcommittee, my name is James Collins and I am Associate Director for Science for the National Institute for Occupational Safety and Health's (NIOSH) Division of Safety Research, part of the Centers for Disease Control and Prevention (CDC) within the Department of Health and Human Services (HHS). I am pleased to appear before you today to provide testimony on Safe Patient Handling. I am accompanied by Dr. Thomas Waters, Senior Research Safety Engineer at NIOSH. Dr. Waters and I are also principal investigators within NIOSH and we have conducted extensive research on safe patient lifting.

Health care workers experience musculoskeletal disorders at a rate exceeding that of workers in construction, mining, manufacturing, and wholesale and retail trade.¹ Musculoskeletal disorders (MSDs) are disorders of the muscles, nerves, tendons, ligaments, joints, cartilage and spinal discs. These injuries are due in large part to repeated manual patient handling activities, often involving heavy manual lifting when transferring and repositioning patients, working in extremely awkward postures, and in pushing and pulling heavy objects. The risk, which can exist even if the patient is of relatively low or moderate weight, is magnified by the increasing weight of patients due to the obesity epidemic in the United States, and the rapidly increasing number of older people who require assistance with the activities of daily living.^{2,3}

NIOSH is proud of the work we have done researching MSDs in health care settings, for developing and evaluating interventions to prevent these problems among health care workers, and in working collaboratively with other Federal agencies and Associations to reduce risk for health care workers.

¹ Bureau of Labor Statistics, U.S. Department of Labor, November 12, 2009, Case and Demographic Characteristics for Work-related Injuries and Illnesses Involving Days Away From Work, Table 10 – Number, percent, and incidence rate of nonfatal occupational injuries and illnesses involving days away from work by selected worker and case characteristics and musculoskeletal disorders, All United States, private industry, 2008. Accessible on the Web at: <http://www.bls.gov/iif/oshwc/osh/case/ostb2211.pdf> .

² State of Washington [2006]. An act relating to reducing injuries among patients and health care workers. Accessible on Web at: <http://www.leg.wa.gov/pub/billinfo/2005-06/Pdf/Bill Reports/House/1672.HBR.pdf>.

³ Ogden, C., Carroll, M., and Curtin, L. (2006). Prevalence of overweight and obesity in the United States, 1999-2004. *Journal of the American Medical Association*, 295, 1549-1555.

Burden of Injuries

Direct and indirect costs associated with back injuries in the health care industry, adjusted for inflation, are estimated to be \$7.4 billion annually in 2008 dollars.⁴ Additionally, nursing aides and orderlies suffer the highest prevalence (18.8%) and report the most annual cases (269,000) of work-related back pain among female workers in the United States.⁵ In 2000, 10,983 registered nurses (RNs) suffered lost-time work injuries due to lifting patients. It has been reported that 12% of nurses who planned to leave the profession cited back injuries as a contributing factor.⁶

The age of the Registered Nursing population has been rising over the past two decades. Between 2004 and 2008, the average age of all licensed nurses rose from 46.8 to 47.0 years and that of employed nurses rose from 45.4 to 45.5 years. This aging trend has raised concerns that future retirements could substantially reduce the size of the U.S. nursing workforce.⁷ Preserving the health of our nursing staff and reducing back injuries in health care personnel is critical. NIOSH has a comprehensive research program aimed at preventing work-related MSDs with major efforts to reduce lifting injuries in health care settings. NIOSH's research with diverse partners has already made great strides in developing best practices and demonstrating the effectiveness of these 'best practices' in health care settings.

The risk of musculoskeletal disorders resulting from patient handling results from the high internal forces created in the spine when a person lifts a heavy object. Musculoskeletal disorders are a high risk for patient handling because it can require lifting a patient who is far away from the worker which puts heavy loads on the spine. Repeated lifting of this type can result in scarring that causes more damage. Studies have suggested that there can be risks of injury even when two people are lifting a 110 lb patient from a bed to a chair.⁸

NIOSH recommends that no caregiver should manually lift more than 35 lbs of a person's body weight for a vertical lifting task.⁹ NIOSH further recommends that when the weight to be lifted exceeds this limit, assistive devices should be used. These recommendations have been adopted by the Veterans Health Administration (VHA) and incorporated into its current patient handling recommendations and patient handling algorithms. Moreover, other major interest groups, such

⁴ Waehrer G., Leigh J., and Miller T. Costs of Occupational Injury and Illness within the Health Services Sector, *Intl. J. of Health Services*, Vol 35(2): 342-359, 2005.

⁵ Guo, HR, Tanaka, S, Cameron LL et al. (1995) Back pain among workers in the United States: national estimates and workers at high risk. *Am J Ind Med*, 28:591-602.

⁶ Stubbs DA, Buckle PW, Hudson MP, Rivers PM, and Baty D [1986]. Backing out: nurse wastage associated with back pain. *International Journal of Nursing Studies* 23(4): 325-336.

⁷ U.S. Department of Health and Human Services (2010). Registered Nurse Population: Initial Findings from the 2008 National Sample Survey of Registered Nurses. Available on the Internet: <http://bhpr.hrsa.gov/healthworkforce/rnsurvey/initialfindings2008.pdf>.

⁸ Marras WS, Davis KG, Kirking BC, Bertsche PK [1999]. A comprehensive analysis of low-back disorder risk and spinal loading during the transferring and repositioning of patients using different techniques. *Ergonomics*. 42(7):904-926.

⁹ Waters T. (2007) When is it safe to manually lift a patient? *American Journal of Nursing*. Vol. 107(8): 53-59.

as the American Nurses Association (ANA), National Association of Orthopaedic Nurses (NAON), and Association of Perioperative Registered Nurses (AORN) have all adopted similar patient handling guidelines that recommend use of technology-based solutions for patient handling and movement.^{10,11,12}

External Factors

A major concern for health care workers is the obesity epidemic that our country is facing. The average body weight of both patients and caregivers is increasing over time and this increase in average body weight is likely to play a major role in increasing risk of MSDs for health care workers. Data from the National Health and Nutrition Examination Survey show that between 1988 and 2008, the average prevalence of obesity rose from 22.9% to 35.5%, and the average prevalence of morbid (extreme) obesity rose from 2.9% to 5.7%. Rates of adult morbid obesity in 2008 ranged from 3.8% of Hispanic men to as high as 14.2% of non-Hispanic black women.^{13,14}

The majority of direct patient care workers are females who, on average, have lower strength and lifting capacity than males. Most female nurses work at a higher percentage of their maximum physical capabilities than males when performing the same strength-demanding tasks. While most health care workers do not have established maximum weight lift limits, in manufacturing industries, where the majority of workers are male, employers have developed maximum weight limits for manual lifting and they have incorporated robots and other lifting assistive devices.

A recently emerging issue that has resulted in increased risk for MSDs for health care workers is that patients are often released from the hospital following surgery and other treatments much earlier than in the past. In 1980, for example, the average length of hospital stay was 7.5 days compared with only 4.8 days in 2005.¹⁵ When patients are dismissed from the hospital earlier in the recovery process, the patient is often more dependent upon the caregiver for assistance in being transferred or in moving. This has resulted in increased risk for workers in the hospital setting due to the concentration of extreme patient needs associated with patient transfers and

¹⁰ AORN Workplace Safety Taskforce. (2007). *Safe Patient Handling & Movement in the Perioperative Setting*. Denver, CO: Association of periOperative Registered Nurses (AORN).

¹¹ de Castro, A.B. (2006). Handle With Care®: The American Nurses Association's Campaign to Address Work-Related Musculoskeletal Disorders. *Orthopaedic Nursing*, 25, 6, 356-364. Reprinted from de Castro, A.B. (2004). Handle With Care®: The American Nurses Association's Campaign to Address Work-Related Musculoskeletal Disorders. *Online Journal of Issues in Nursing*. Vol. #9 No. #3. Retrieved from <http://www.nursingworld.org/MainMenuCategories/ANAMarketplace/ANAPeriodicals/OJIN/TableofContents/Vol9me92004/Number3September30/HandleWithCare.aspx>.

¹² NAON (2009) Safe Patient Handling. Special Issue. *Orthopaedic Nursing*, 28(25) 2-35.

¹³ Flegal, K., Carroll, M., Ogden, C., and Curtin, L. (2010). Prevalence and trends in obesity among U.S. adults, 1999-2008. *Journal of the American Medical Association*, 303, 235-241.

¹⁴ Flegal, K., Carroll, M., Ogden, C., and Johnson, C. (2002). Prevalence and trends in obesity among U.S. adults, 1999-2000. *Journal of the American Medical Association*, 288, 1723-1727.

¹⁵ National Center for Health Statistics (2007) 2005 National Hospital Discharge Survey, Retrieved from <http://www.cdc.gov/nchs/data/ad/ad385.pdf> on 2/2/2010.

movement while in the acute care environment. It also increases the level of patient transfer assistance needed in the home care environment at an earlier stage of recovery than was previously required, placing home health care workers at increased risk. The home health care worker is now exposed to higher levels of physical demands in a care environment where the availability of assistive patient handling technology is often lacking.^{16,17}

Prevention Research

NIOSH carried out a comprehensive lab and field study to identify safer ways to lift and move nursing home residents. The study design included removing the excessive forces and extreme postures that can occur when manually lifting residents. Historically, the caregiver has used his or her own strength to provide manual assistance to the resident. NIOSH also conducted a field study to determine if a “best practices” intervention consisting of mechanical equipment to lift physically dependent residents, training on the proper use of the lifts, a safe lifting policy, and a medical management program would reduce the rate and the associated costs of the resident handling injuries for the nursing personnel in a real world setting. During the 6-year period, from January 1995 through December 2000, 1,728 nursing personnel were studied before and after implementation of the intervention. After the intervention, which was a safe lifting program that includes mechanical lifting equipment, worker training on the use of the lift, and a written resident lifting policy, there was a 61% (range 45-71%) reduction in workers’ compensation injuries involving resident handling, workers' compensation costs, and lost work day injuries. The initial investment of \$158,556 for lifting equipment and worker training was recovered in less than 3 years on the basis of post-intervention savings of \$55,000 annually in workers' compensation costs.¹⁸ This is significant given that cost is an often cited barrier to purchasing lifting equipment and establishing safe patient lifting programs. Another advantage of lifting equipment is the reduction in the rate of assaults on caregivers during resident transfers—down 72% on the basis of workers' compensation claims.

Based on the successes achieved in the long-term care industry, NIOSH has undertaken a new six-year longitudinal research study to evaluate the effectiveness of a "best practices" safe patient handling program at two large acute-care hospitals in the United States.

Another major study demonstrating success in reducing back injuries to health care workers was funded by NIOSH through a cooperative agreement. The study examined the long-term effectiveness of a safe lifting program with the primary objective to reduce injuries to health care workers resulting from manual lifting and transferring of patients. These safe lifting programs,

¹⁶ Galinsky T, Waters T, and Malit B. Overexertion Injuries in Home Health Care Workers and Need for Ergonomics. *Home Health Care Services Quarterly*. 20(3):57-73. 2001.

¹⁷ NIOSH (2010), NIOSH Hazard Review Occupational Hazards in Home Health care. DHHS(NIOSH) Publication No. 2010-125. National Institute for Occupational Safety and Health, Cincinnati, Ohio.

¹⁸ Collins, J.W., Wolf, L., Bell, J., and Evanoff, B. (2004). An evaluation of a "best practices" musculoskeletal injury prevention program in nursing homes. *Injury Prevention*, 10, 206-211.

which used employee management advisory teams, i.e., a participatory-team approach, were used in seven nursing homes and one hospital. In this study, manual lifting and transferring of patients was replaced with modern, battery operated, portable hoists, and other patient-transfer assistive devices. The number of injuries from patient transfers decreased by 62%, lost work days decreased by 86%, restricted workdays decreased by 64%, and workers' compensation costs were reduced by 84%. Overall, the program produced many intangible benefits including improvements in patient comfort and safety during transfers and patient care. The nursing personnel reported that their backs were less sore and that they were less tired at the end of their shifts.¹⁹

Despite the obvious advantages to using lifting equipment, schools of nursing continue to teach, and nurses' licensure exams continue to include, outdated and unsafe manual patient handling techniques.²⁰ This is due in large part to outdated books and curricula both of which promote unsafe patient handling practices. To address this, a team of experts from NIOSH, the American Nurses Association, and the Veterans Health Administration developed and evaluated an evidence-based training program on safe patient handling for educators at schools of nursing that relies on use of technology for moving and transferring patients. The study found that when using the curriculum, nurse educator and student knowledge improved significantly as did the intention to use mechanical lifting devices in the near future.^{21,22,23}

Guidelines

Over the past decade, we have found that best practices are specific to health care settings. What works in critical care may not be appropriate for emergency room settings or operating rooms. Because each health care setting has specific needs for specialized approaches, NIOSH worked collaboratively with outside groups to develop safe patient handling guidelines for caregivers in operating rooms and in orthopaedic settings (AORN and NAON efforts).

Recently, the health care industry has recognized the risks associated with performance of physically demanding patient handling tasks, and to reduce costs and increase productivity, companies have begun to implement ergonomic programs or practices aimed at preventing these injuries. The core element of these programs is reliance on use of state-of-the-art ergonomically designed equipment to assist the worker in carrying out the prescribed task. As an added

¹⁹ Garg, A. (1999). Long-term effectiveness of "Zero-Lift Programs" in seven nursing homes and one hospital. U.S. Department of Health and Human Services, National Institute for Occupational Safety and Health, Contract Report No. U60/CCU512089-02.

²⁰ National Council of State Boards of Nursing [2006]. National Council Licensure Examination (NCLEX)[®] Website. Accessible on Web at: <https://www.ncsbn.org/245.htm>. Last accessed on November 25, 2006.

²¹ Nelson et al. (2007): Evidence-Based Nursing School Curriculum in Safe Patient Handling. *International Journal of Nursing Education Scholarship*, Vol. 4, Iss. 1, Art. 26.

²² Menzel, N. (2007). Preventing Musculoskeletal Disorders in Nurses: A Safe Patient Handling Curriculum Module for Nursing Schools. *Nurse Educator*. 32 (3):130-135.

²³ NIOSH (2009), *Safe Patient Handling Training for Schools of Nursing, Curricular Materials*. DHHS(NIOSH) Publication No. 2009-127. National Institute for Occupational Safety and Health, Cincinnati, Ohio.

incentive to adopt technology-based patient handling practices, OSHA recently published an ergonomics guideline that provided an overview of the risks of work-related MSDs in nursing homes. The guideline provided information about the most effective approaches for mitigating or reducing those risks, and discussed training needs.²⁴ The most important recommendation in the OSHA nursing home guideline was that “manual lifting of residents be minimized in all cases and eliminated when feasible.” This is best accomplished by implementing a technology-based safe patient handling program.

In 2009, NIOSH initiated a project aimed at improving safety while lifting and moving bariatric patients. In health care settings, the term "bariatric" is used to refer to patients whose weights exceed the safety capacity of standard patient lifting equipment (300 lbs), or who otherwise have limitations in health, mobility, or environmental access due to their weight/size.²⁵ Compared to the non-obese population, obese individuals require more frequent and extensive health care due to obesity-related health problems, and health care personnel are encountering hospitalized and critical-care bariatric patients on an increasingly frequent basis.^{26,27,28} In the extreme, such patients can weigh over 1,200 pounds. The upcoming NIOSH project will evaluate bariatric patient handling practices at multiple hospitals, including intervention programs and health/safety outcomes, in order to identify and promote evidence-based best practices.

We all have a vested interest in taking care of those who help take care of us and our families when we need medical attention. It is likely that the implementation of the research presented here will significantly reduce injuries and illnesses for health care workers and increase the quality of patient care. In turn, reducing MSDs among nurses may help address the critical issues of nurse recruitment and retention.

Conclusion

In closing, NIOSH has shown that manual handling of patients is a serious risk to health care workers and that we continue to work diligently to protect the safety and health of those workers. We have assessed the overall scope of the problem, characterized the risks from moving patients, and identified increasing risks due to the aging workforce and obesity epidemic in the United States. We have also developed some practical solutions in terms of best practice programs that rely on use of technology-based solutions. Our efforts have shown that there are effective

²⁴ OSHA (2009) *Ergonomics for the Prevention of Musculoskeletal Disorders: Guidelines for Nursing Homes*. U.S. Department of Labor, Occupational Safety and Health Administration. Document No. OSHA 3182-3R.

²⁵ Bushard, S. (2002). Trauma in patients who are morbidly obese. *Association of PeriOperative Registered Nurses (AORN) Journal*, 76, 585-589.

²⁶ Pieracci, F., Barie, P., and Pomp, A. (2006). Critical care of the bariatric patient. *Critical Care Medicine*, 34, 1796-1804.

²⁷ Reto, C. (2003). Psychological aspects of delivering nursing care to the bariatric patient. *Critical Care Nursing Quarterly*, 26, 139-149.

²⁸ Tizer, K. (2007). Extremely obese patients in the health care setting: Patient and staff safety. *Journal of Ambulatory Care Management*, 30, 134-141.

alternatives to manual patient handling that are safe and cost effective to implement. We appreciate the opportunity to present our work to you and thank you for your continued support.

I would be pleased to answer your questions.