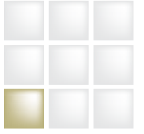
Joerns Healthcare

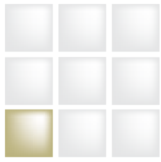
Selecting Beds for a Safer Environment

Dr. Guy Fragala, Ph.D., P.E., C.S.P.



An Ergonomist's Look at Post Acute and the Results of Creating A Safer Environment

CASE
Creating A Safer Environment



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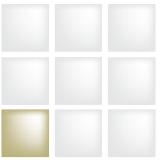
Introduction

Our long term care facilities are dedicated to providing quality care to our aging population, which can be dangerous to both the resident and the caregiver. A major risk for residents is falls and a major risk for caregivers are strains and sprains which result from helping residents with positioning and mobility needs. These two safety problems are now well recognized. Efforts for resident fall management programs have been on the safety agenda for many organizations over the years while staff injury prevention programs, related to safe lifting and moving of residents, are a more recent priority area. Understanding, identifying and implementing solutions is not an easy task. Approaches to improvement will involve a multi-factorial approach and can sometimes seem overwhelming. A practical approach is to identify major components of the set of solutions and implement these individual solution components with appropriate knowledge and focus.

Optimizing furnishings in the physical environment in which care is delivered can be one of the most effective safety components in the solution spectrum available. The most important furnishing within the environment of care is the bed provided for the resident. Understanding the needs of the resident, through a proper assessment, and matching available bed system features to those needs might be the most important individual solution component when formulating the multi-factorial solution set to address the risks of resident falls and caregiver strains and sprains.

This article will present further insight into the magnitude of the problem of resident falls and thoughts about causation. Information to help understand the demands on caregivers, which put them at risk for occupational injuries is also being provided. To help create safer environments and provide direction for improvement efforts, guidelines are summarized and offered to the reader to aid with bed selection. It is the

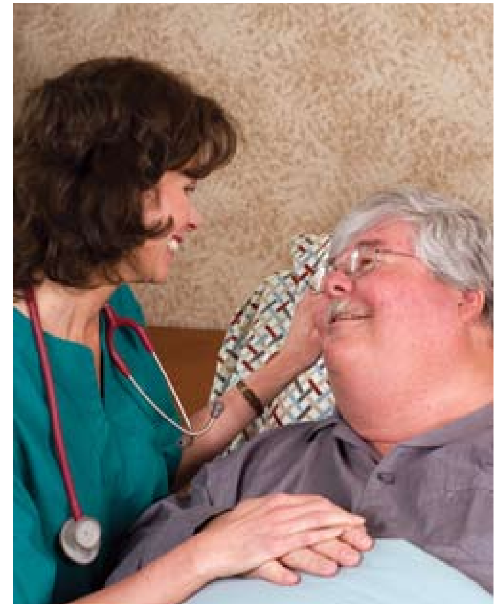


opinion of the author, that if those in the long-term care industry gain a better understanding of the risk factors related to resident falls and staff injuries and acquire bed systems which better consider the needs of the resident, significant progress can be achieved in improving safety in the environment of care.

Resident Falls – The Magnitude of the Problem

The risk of residents falling in the long term care setting has been well documented. It has been estimated that 45% to 70% of residents fall each year and of these individuals, 50% experience multiple falls (Thapa 1996). It has also been determined that older adults in the long-term care setting are two to three times more likely than those older adults, living at home, to experience multiple falls (Thapa 1996; Egaz 1994; Rubenstein 1994; Nurmi 1996; Ray 1997). Approximately one-half of these falls that occur involve falling from bed (Tideisaar 2008). Falls from the bedside are associated with significant physical and psychological complications. These complications include injuries such as hip and other fractures, immobility resulting in muscle weakness, functional disability, increased risk for potential falls, and psychological distress such as depression and fear of falling (Tideisaar 2008).

The cost of these falls can present a very serious financial burden to our healthcare delivery systems in addition to the serious health risks suffered by our elderly population. A study of people 72 and older found that the average health care cost of a fall injury was $19,440 (including hospital, nursing home, emergency room, and home health care, but not doctors services) (Rizzo 1998). The total direct cost of all fall injuries for people 65 and older in 2000 was slightly more than $19 billion: $0.2 billion ($179 million) for fatal falls, and $19 billion for nonfatal falls (Stevens 2006). By 2020, the annual direct and indirect cost of fall injuries is expected to reach $43.8 billion (in current dollars) (Englander 1996).



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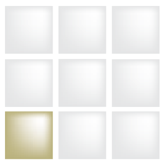
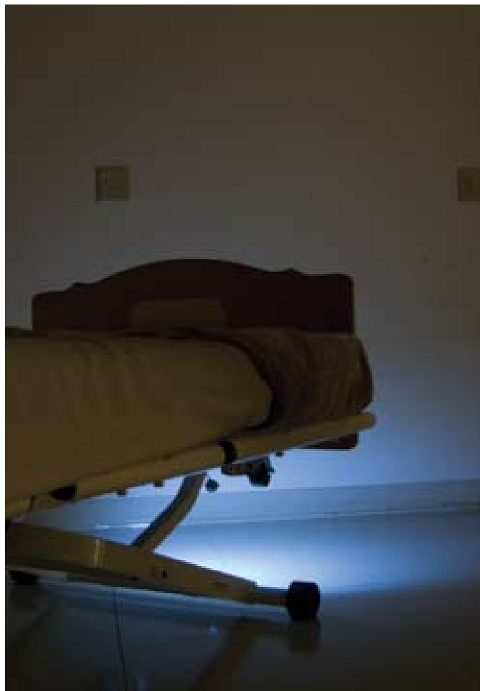


Resident Falls-Considering Causation

Most falls do not have a single cause but result from the interaction of several risk factors. Bed falls are common among residents with lower extremity dysfunction, cognitive disorders and those who are taking medications which impair ability to rise up and move independently. High bed heights and soft mattresses can be factors contributing to falls when a resident is trying to get out of bed. Bladder dysfunction can lead to increased frequency in attempts to leave the bed. New residents in unfamiliar surroundings placed in a new bed which is of a different height and width and on casters also increases risk (Tideisaar 2008). Subsequently as stated, multi-factorial interventions are often required while managing residents at increased risk of falling. In one study, the implementation of an interdisciplinary program that included staff education, environmental modification, exercise programs, supplying aids, reviewing drug regimens, providing free hip protectors, and having post-fall problem-solving conferences significantly decreased the risk of falls and hip fractures among institutionalized elderly (Rubenstein 1990). Other studies have demonstrated similar findings (Jensen 2002; Ray 1997).

Sleeping in the low position helps reduce injuries from falls.

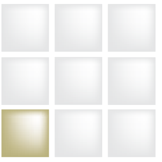


Underbed lighting illuminates area around the bed for greater staff visibility.

Caregivers at Risk for Injury

Today much attention is being focused on occupational risks to healthcare workers. In fact, in Bureau of Labor Statistics, healthcare workers are consistently listed as one of the highest risk occupations. Compared to other occupations, nursing personnel are among the highest at risk for musculoskeletal disorders. Nursing aides, orderlies, and attendants ranked second, immediately following laborers (first) and RNs fifth in a list of at-risk occupations for strains and sprains (Bureau of Labor Statistics 2006).

When considering the event leading to an occupational injury in nursing and personal care facilities, overexertion, specifically from lifting, is a major contributing factor (Coggan 1994; Engkvist 1992; Enos 2003; Harber 1985; Hignett 1996; Jensen 1988; Khuder 1999; Knibbe 1996;



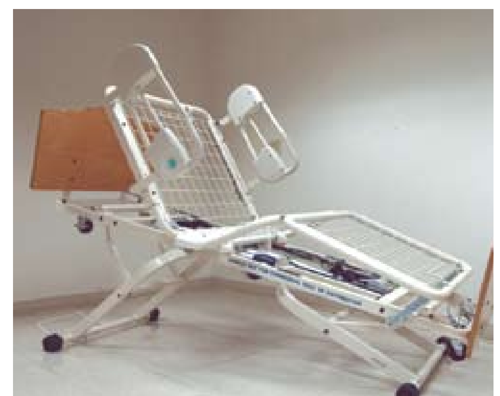
Ljungberg 1999; Pheasant 1992; Trinkoff 2002). In fact, the incidence rates calculated for overexertion as the cause for injuries in nursing and personal care facilities are four times higher than the national average for all industry (Bureau of Labor Statistics 2000). Nationally, the estimated average cost per back injury claim is $24,000. If surgery is involved, the cost for claims increases significantly to $40,000 per injury or higher. One example of a back injury involving surgery totaled $240,000 (Nelson 2005).

The Need to Reposition Residents in Bed

Proper positioning in bed is important to the immobilized long term care resident for comfort, safety and quality of care. When a resident immobilized for any reason and will spend extended periods of the day in bed, frequent and proper position changes can be beneficial (Metzler 1996). Research has shown that immobility can adversely affect all body systems. For example, immobility decreases gastrointestinal and genitourinary activity, putting residents at risk for constipation, urinary stasis, and fluid retention. It also results in diminished muscle tone, general weakness, fatigue, and venous stasis, which may lead to thrombophlebitis, pulmonary embolism, and reduced peripheral perfusion. Reduced peripheral perfusion, in turn, contributes to skin breakdown, particularly over bony prominences (Metzler 1996).

Repositioning Residents and the Risk to Caregivers

When attempts are made to manually reposition a patient in bed, the caregiver is at a high risk for a musculoskeletal disorder. Both the worker's posture and the weights involved in the repositioning tasks place excessive forces on the caregiver's musculoskeletal structure. A recent study conducted in a biodynamics laboratory demonstrated that traditional repositioning techniques applied within the healthcare industry present one of the highest occupational risks tolerated by caregivers in healthcare (Marras 1999).



Advanced positioning helps reduce manual strain when repositioning residents.

Slide sheets helps reduce manual force required to repositioning residents in bed.

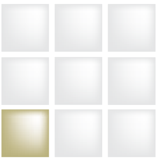
In addition to Marras' laboratory study, field investigations reviewing causation of low back pain in nurses have further demonstrated the task of repositioning of patients to be one of the highest risk activities presented to workers. In a survey of staff nurses at a large tertiary care hospital, the task of lifting or pulling a patient up in bed was the leading activity reported as the cause of back pain (Harber 1985).

A large tertiary care hospital in Athens, Greece employed the same questionnaire as used by Harber and colleagues. Lifting or pulling a patient up in bed was the activity listed as the second leading cause of back pain (Vasiliadou 1995). This study in Greece also demonstrated the task of lifting a patient up in bed to be a high frequency activity, in fact, when heavy, physically-demanding tasks were considered, lifting or pulling a patient up in bed placed the highest task frequency demand on the nurses questioned in this study.

A cross-sectional survey of 2,405 nurses employed by a group of teaching hospitals in England further demonstrated repositioning of patients presenting risk to workers (Smedley 1995). Those nurses who were required to more frequently reposition patients reported a higher rate of back pain.

In an investigation conducted in The Netherlands, a different questionnaire was administered to nurses where they were asked whether or not they could describe any moments they considered to be physically demanding. The majority answered in the affirmative and 89.9% actually described those situations. The activities most often sited as physically demanding involved repositioning patients in bed, specifically, up in bed, side ways, or turning 31.3%, and transfers of patients in bed associated with nursing activities 37.3% (Knibbe 1996).

A recent study conducted by the author, further confirmed repositioning of patients as one of the highest risk occupational activities presented to caregivers within healthcare. Insurance injury records were reviewed for seven hospitals over a two-year period. The activity which ranked number one when considering activities causing strains and



sprains to healthcare workers was repositioning patient, this included turning and lifting a patient up in bed (Fragala 2003).

Seeking Improvement through Proper Bed Selection

Integrating proper design features into bed systems can be a very important factor to reduce and minimize some of the risk factors related to resident falls and caregiver strains and sprains. Features to consider when selecting beds which can minimize some of the risks related to patient falls and staff strains and sprains are as follows:

- Ability to achieve a very low position which can reduce the potential severity of injury if a resident were to roll out of bed.
- A wide range of bed height travel distance to safely accommodate the needs of the individual resident and allow optimum bed height positions for caregivers to deliver care to residents and to turn and reposition residents as required.
- Sufficient hi-lo and position travel speeds which will not present unnecessary delays and discourage staff from using proper bed height and position features.
- Bed deck design and construction and how the deck will move when positioning adjustments are being made. If the deck is designed properly it will minimize resident migration and sliding down in bed. If the resident stays properly positioned it can minimize risk related to the high risk task of repositioning.
- Adequate bed deck size which will provide sufficient surface area to easily turn and position a resident to deliver needed care. Surface area can also be important to the resident to allow for proper independent movement and to decrease the risk of rolling out of bed.

7" low position helps reduce resident injuries.

Faster hi-lo speed option leads to more efficient care and better care plan compliance.

Comfort extension kit provides expanded surface width for safer and easier repositioning.

Implement custom egress bed height with use of ergonomic and easy-to-operate hand pendant.

UltraLock mobility provides 3-point lockdown with one easy movement.

Trendelenburg position uses bed functionality to reposition residents vs. caregiver manual effort.

- Ability to easily achieve optimum bed egress height for each individual resident. Having the ability to customize for each individual resident's optimum egress height will encourage the use of this important bed feature making it easier for independent egress and for staff members to assist a resident out of bed.

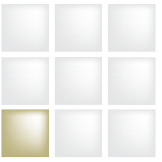
- Ambulatory assist devices which can facilitate bed egress for both the resident and the caregiver. These devices which can be mounted in place of bed rails can also allow those residents who are capable, to participate in being repositioned in bed. These devices should be easily removable to eliminate obstructions when not required.

- A mechanism to lock out bed casters which will eliminate the chance for casters to be unlocked when a resident might be getting out of bed.

- Auxiliary illumination provided under the bed which will help residents getting out of bed at night or in poorly lit areas.

- Ability to achieve a chair position which will allow for changes of posture in bed and can reduce the frequency of the high risk task of a bed to chair transfer. This feature can also keep the resident better positioned in bed and minimize the frequency for the need to manually reposition a resident in bed.

- Ability to achieve the Trendelenburg position which can be very helpful when it might be required to pull a resident up in bed.



Guy Fragala, Ph.D., PE, CSP

Dr. Guy Fragala has over 35 years of experience as an Occupational Safety and Health professional and is currently the Senior Advisor for Ergonomics at the Patient Safety Center of Inquiry, Tampa, Florida and the champion for Creating the Safer Environment Program for Joerns Healthcare.

He recently served as Director of Compliance Programs with Environmental Health and Engineering in Newton Massachusetts. He is retired from the faculty and previously served in the position as the Director of the Environmental Health and Safety Department at the University of Massachusetts Medical Center in Worcester, Massachusetts. He has consulted to a wide range of American industries and government agencies and authored numerous publications on the subjects of Ergonomics and Environmental Health and Safety. He has delivered many presentations on the subject of Application of Ergonomics to the healthcare industry.

He has worked with the Patient Safety Center in Tampa, the Occupational Safety and Health Administration (OSHA), the Joint Commission on Accreditation of Healthcare Organizations (JCAHO), and the National Institute for Occupational Safety and Health (NIOSH) on safe patient handling issues. His book entitled, *Ergonomics: How to Contain On-the-Job Injuries in Healthcare* has provided the foundation for much of the work going on today in safe patient handling. Ideas from his five-step risk management process have been integrated into many successful programs.

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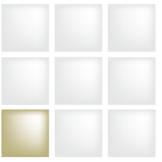

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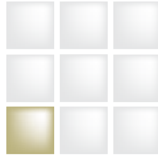

Creating a Safer Environment (CASE) provides solutions for safety in your facility by addressing your current challenges and helping prevent future issues.

Joerns Healthcare Inc.
5001 Joerns Drive, Stevens Point WI 54481
(P) 800.826.0270 | (F) 800.457.8827
www.joerns.com | email: info@joerns.com

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