

Bed care for patients in palliative settings: considering risks to caregivers and bed surfaces

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Abstract

Ensuring patients are comfortable in bed is key to effective palliative care, but when moving and positioning patients in bed, health professionals face an occupational risk of injury. The turning and positioning (TAP) system is a new method of moving patients in bed, that evidence has shown to reduce the risk of injury to caregivers. Providing the correct bed surface is another aspect of bed care essential to the comfort of the palliative patient, and to aid wound prevention and treatment. It is important to take a patient-centred approach when considering the most appropriate bed surface patients. This article provides an overview and discussion of these two aspects of bed care for palliative patients.

Key words: Safe patient handling ● Patient positioning ● Injury prevention ● Wound prevention ● Turning and positioning patients

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The objective of palliative care is 'to prevent and relieve suffering and to support the best possible quality of life for patients and their families, regardless of the stage of disease' (National Consensus Project for Quality Palliative Care, 2009). A large proportion of the population requiring palliative care are the elderly as they approach the end of life. Geriatric palliative care focuses on quality of life, support for functional independence, and centrality of the patient's values and experiences in determining the goals of medical care (Morrison and Meier, 2003). Important to the goals and objectives of palliative care is the ability to move and position the patient in bed and the ability to move the patient out of bed as necessary. Palliative care patients who spend a great deal of time in bed are subject to dyspnoea, depression, fatigue, gastrointestinal symptoms, and pain (Boltz et al, 2011), in addition to increased risk of soft tissue ulceration (Hench and Gustafsson, 2003; Naylor, 2005). Increasing age has been found to be significantly associated with pressure ulcer development in hospice patients (Hench and Gustafsson, 2003; Reifsnnyder and Magee, 2005). Repositioning and turning the individual patient at periodic intervals,

in accordance with the individual's wishes and tolerance can be important in reducing the risk of developing pressure ulcers (Defloor et al, 2005; Whitney et al, 2006).

Turning and repositioning patients in bed can put both the patient and caregiver at risk of injury. For example, when patients are held under the axillae while being pulled up in bed, caregivers can compress arteries and damage the brachial plexus (Metzler and Harr, 1996). In addition, any movement over the bed surface creating shear forces can be damaging to the patient's skin. When conducting turning and positioning activities, caregivers are often in awkward postures and at risk for overexertion as they move patients in bed. Research and clinical experience have demonstrated that the task of patient repositioning exposes caregivers to a high risk of experiencing musculoskeletal disorders. The occupational risk to caregivers presented by the need to turn and reposition patients can be reduced through the effective use of technology and aids currently being developed and in use today in some health-care facilities.

Injury statistics

Historically, caregivers in the health-care industry have been listed as one of the most at-risk employees for suffering an occupational musculoskeletal injury. According to the US Bureau of Labor Statistics (2013), health-care workers consistently rank above lorry drivers, labourers, assemblers, and cleaners for occupational injuries. Musculoskeletal disorders, specifically back injuries associated with patient handling tasks, are a major contributor to this injury problem. In nursing and personal care facilities, overexertion, specifically from lifting and moving patients, is a major contributing factor in work-related injuries. In 2012, musculoskeletal disorders for caregivers in health care made up 42% of cases with a rate of 55 cases per 10 000 full-time workers. This rate was 56% higher than the rate for all private industries and second only to the transportation and

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warehousing industry (US Bureau of Labor Statistics, 2013).

Turning and positioning patients: a high-risk activity

The magnitude of the occupational risk to caregivers when performing tasks related to positioning patients in bed has been well reported in the literature. Manual repositioning of patients in bed puts caregivers at high risk for musculoskeletal injuries (Collins et al, 2006; Skotte and Fallentin, 2008; Pompeii et al, 2009; Bartnik and Rice, 2013). During repositioning tasks, excessive forces are imposed on the caregiver's musculoskeletal structure due to the external load resulting from the weight of the patient and the worker's posture and position during the activity.

The risk of lower back injury for specific repositioning tasks performed by health professionals has been previously evaluated by Marras et al (1999). Repositioning techniques such as the manual two-person draw sheet method, the manual two-person hook method, and the manual two-person thigh and shoulder method were found to present a high probability of risk of lower back injury for caregivers (Marras et al, 1999). Of the repositioning tasks examined, the single-person hook method, where a single caregiver must reach over the bed and grasp the patient under the axillae for repositioning, was found to have the highest predicted risk for lower back injury when considering all jobs from a variety of industries included in the study. The study concluded that traditional repositioning techniques applied within the health-care industry present one of the highest occupational risks caregivers are exposed to in hospital settings (Marras et al, 1999).

Further supporting the evidence gained in laboratory studies and field investigations examining the causes of lower back pain in nurses have demonstrated the task of repositioning of patients in bed to be one of the highest risk activities undertaken by health-care workers. At a large tertiary care hospital, the task of lifting or pulling a patient up in bed was the leading activity reported as a cause of back pain (Harber et al, 1985). Results demonstrated that 48% of nurses reported the task of lifting or pulling a patient up in bed caused them to suffer back pain. Lifting or pulling a patient up in bed was also reported as a commonly required activity for those nurses working in medical/surgical units and in critical care units. Some 40% of critical care unit nurses, 34% of medical ward nurses and 27% of surgical ward nurses reported having to lift or pull a patient up in bed more than six times per shift.

In England, a large cross-sectional survey of



Figure 1. Two caregivers beginning to turn and position the patient with the TAP



Figure 2. Extension handles are provided on the TAP to facilitate turning and movement of the patient



Figure 3. Foam wedges are provided to keep the patient better positioned once turned

‘Repositioning patients, including turning and lifting patients up in bed, was ranked as the most significant activity leading to compensable injuries.’

2405 nurses employed by a group of teaching hospitals reported manually moving a patient in bed was one of the highest risk activities for back pain for the nurses surveyed (Smedley et al, 1995). The responses indicated that 51% of nurses who were required to do 10 or more repositioning tasks in a work shift reported back pain (270 out of 530). For those who performed five to nine repositioning tasks per work shift, 49% reported this task as a cause of lower back pain. Results of this survey indicate that nurses who were required to more frequently reposition patients reported a higher rate of back pain.

An investigation conducted in the Netherlands administered a questionnaire to nurses in which they were asked whether or not they could describe activities they considered to be physically demanding (Knibbe and Friele, 1996). The majority answered in the affirmative and 89.9% of respondents actually described those physically demanding situations. The activities most often cited as physically demanding involved repositioning patients in bed, specifically, up in bed, sideways, or turning (31.3%), and transfers of patients in bed associated with nursing activities (37.3%).

A study which reviewed workers’ compensation insurance injury records for seven hospitals over a 2-year period further demonstrated repositioning of patients as one of the highest risk occupational activities presented to caregivers within health care. Repositioning patients, including turning and lifting patients up in bed, was ranked as the most significant activity leading to compensable injuries (Fragala and Pontaini-Bailey, 2003).

A better method for turning and positioning patients

One of the most commonly applied methods for turning a patient in bed involves the use of a draw sheet and pillows for holding the patient in place once turned. Although widely used, this method places the caregiver at significant risk for occupational injuries based on the information provided above and from ergonomic assessment of the job task. Friction-reducing sheets have been used in place of the traditional draw sheet method in attempts to reduce risk associated with patient turning and positioning tasks. Friction-reducing devices may reduce risk to the caregiver by reducing the force required to turn the patient through the friction-reducing properties of the device. A drawback to the use of friction-reducing devices is the need to insert and remove the device each time it must be used. In order to insert a friction-reducing device the patient must be manually turned on their side using a log-rolling technique. This com-

monly used technique has been cited as another activity which places caregivers at risk of injury (Gonzalez et al, 2009). Health professionals have stated that the use of friction-reducing aids can be helpful and a solution such as this would be much more effective if the device could remain under the patient (Safe Patient Handling Discussion Group, LinkedIn <http://tinyurl.com/safpathand>).

In response to the need to have a device which can assist with turning and positioning patients and remain under the patient, the Turning and Positioning System (TAP) was developed by Sage Products (Figures 1–3). The TAP system provides the benefits of friction-reducing sheets plus additional improvements targeted at risk reduction, and is commercially available and in use in many health-care facilities. In addition to the excessive loads involved in manual patient handling contributing to the risk factor of force, the posture of the caregiver is an additional risk factor. Handle extension straps are attached to the new TAP repositioning sheet (Figure 2), which allow caregivers to assume a better grip while being in a more upright posture with less bending of the body trunk. In order to have the patient remain in the desired position once turned, the TAP system includes foam wedges which can be inserted under the patient once turned (Figure 3).

To investigate the potential risk reduction that might be achieved through use of the TAP system, a laboratory study was conducted, and the results demonstrated a significant decrease in perceived exertion over the traditional draw sheet method (Fragala and Fragala, 2014). Measuring perceived physical exertion was shown to be an effective technique to investigate relative risk of patient handling activities (Owen et al, 1992; Winkelmoen et al, 1994; Owen and Fragala, 1999). Comparing mean relative perceived exertion reported by caregivers when turning and positioning patients in bed using a traditional draw sheet method versus the TAP system yielded the the perceived physical exertion differences shown in Figure 4.

Exertion in all physical areas examined (shoulder, upper back, lower back and whole body) differed significantly between the traditional draw sheet method and the TAP system. Lower back exertion showed the greatest difference, with the perceived exertion reported using the traditional draw sheet method 173% greater than the TAP method (Fragala and Fragala, 2014). Results from this pilot study indicate that through application of the TAP system, the high occupational risk activity of turning and positioning a patient in bed can be made safer and easier for caregivers to perform.

Considering bed surfaces

The use of the correct bed surfaces for palliative care patients is particularly important because of the amount of time the patient might spend in bed and the potential for skin deterioration and development of pressure ulcers. For some patients, where frequent repositioning might not be appropriate, the quality and properties of the bed surface are even more important. It is considered acceptable to discontinue frequent turning schedules if the palliative care patient refuses, or if frequent repositioning will lead to increased pain, risk of skin tears and sleep disturbance (Burt, 2013).

Available surfaces for palliative care patients include foam mattresses, static foam, gel and air surface combinations, dynamic air surfaces and powered fluidised surfaces. Foam surfaces differ in quality and performance with regards to wound prevention and care. A study involving a total of 16 285 patients, which assessed the impact of various support surfaces in preventing pressure ulcers of any grade, concluded that there is strong evidence to support the efficacy of higher-specification foam mattresses (vs. standard foam mattresses) and sheepskins in pressure ulcer prevention (McInnes et al, 2012). Viscoelastic foam, commonly referred to as memory foam, demonstrates better pressure-relieving properties than standard foam and should be used when foam mattresses are appropriate. Dynamic air surfaces are powered with electricity which alters the level of support through inflation and deflation of air. By changing the level of inflation and deflation, levels of support can vary and relieve pressure, some lateral rotation can be accomplished and moisture management can be achieved through air loss. Dynamic air surfaces should be considered if a patient cannot reposition themselves independently or if the patient has a poorly healing ulcer (Whitney et al, 2006).

Air-fluidised Therapy (AFT) surfaces have demonstrated the best performance related to wound prevention and care (Ochs et al, 2005). A retrospective analysis of pressure ulcer prevention and treatment reported that ulcers treated with AFT had statistically significant faster healing rates (particularly for stage 3 and 4 ulcers) with significantly fewer hospitalisations and emergency room visits (Ochs et al, 2005). AFT support surfaces have demonstrated great healing potential and can be beneficial to the palliative care patient. Traditional AFT support provides pressure redistribution via a fluid-like medium created by forcing air through ceramic beads which creates immersion and envelopment. These surfaces have traditionally been part of a large,

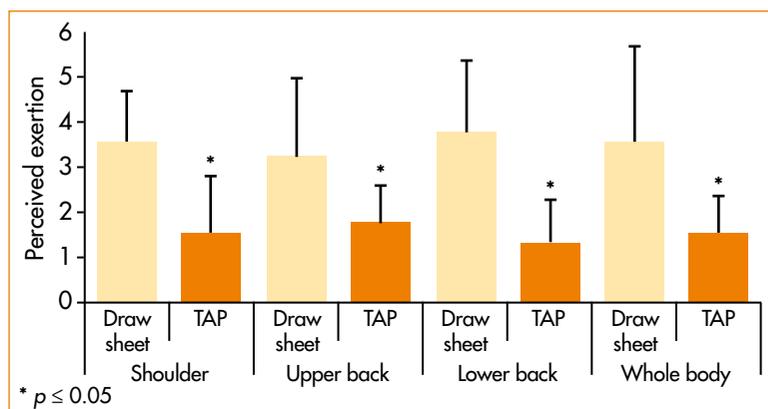


Figure 4. Perceived exertion of patient repositioning tasks using the traditional draw sheet method vs. the Turning and Positioning System (TAP) method. (Fragala and Fragala, 2014)

heavy and expensive specialty bed system and although very desirable for wound care, problems have been encountered with application. There have been problems with bead leakage and it is very difficult to move patients in and out of the bed. Since these AFT bed systems are operating with air being forced through ceramic beads, the air can become heated and this may raise room temperature due to the constant hot air exhaust. Continuous exposure to warm dry air can lead to increased, evaporative water loss and may require oral or IV therapy. Excessive incontinence and exudate saturates the beads and hampers fluidisation. The use of petroleum-based ointments and silver compounds ruin the coating on the beads and can permanently destroy their fluidising properties.

The characteristics and performance of AFT support are highly desirable for the palliative care patient and today there is an alternative and improved option to AFT support systems referred to as fluid immersion simulation (FIS). FIS technology creates an optimal immersion and envelopment profile based on measurement and response to specific patient body mass and contour. This creates a near neutrally buoyant state, by simulating the effects of a body immersed in a fluid medium. Available FIS surfaces are designed to fit every standard health-care bed frame (for example Dolphin, manufactured by Joerns RecoverCare). This facilitates all positioning, lifting, and patient mobility needs across the full range of patient populations in any health-care facility. FIS surfaces accelerate wound healing while providing optimal patient comfort. The patient doesn't feel 'trapped' in the bed, promoting mobility and quality of life while improving caregiver access. FIS surfaces provide the benefits of AFT support without the problems encountered with AFT and are an excellent option for

‘Fluid immersion simulation technology creates an optimal immersion and envelopment profile based on measurement and response to specific patient body mass and contour.’

the palliative care patient where frequent repositioning is not appropriate (Ochs et al, 2005).

Summary

Turning and positioning patients in the palliative care setting can be made safer for both the patient and caregiver through the use of turning and positioning assist devices. Health professionals responsible for providing palliative care should investigate, where practical, what aiding devices are available and which devices might be appropriate in their setting. Risk related to turning and positioning palliative care patients can also be reduced through application of appropriate bed support surfaces. When considering the right surface, a full patient assessment should be conducted to match the patient’s need with the best surface available. All palliative care patients should have at least a high-specification foam mattress such as memory foam. For those patients at greater risk of developing pressure ulcers or who might be difficult to turn and position, more sophisticated powered surfaces should be considered. FIS surfaces provide a good option for application in palliative care environments. Through an understanding and application of available technology, a higher quality of bed care can be delivered to palliative care patients. 

Declaration of interests

The author has no conflicts of interest to declare

Bartnik LM, Rice MS (2013) Comparison of caregiver forces required for sliding a patient up in bed using an array of slide sheets. *Workplace Health and Safety* 61(9): 393–400

Boltz M, Capezuti E, Fulmer T (2011) *Evidence-Based Geriatric Nursing Protocols for Best Practice*. 4th edn. Springer, London

Burt T (2013) Palliative care of pressure ulcers in long-term care. *Annals of Long-Term Care* 21(3): 20–8

Collins J, Nelson A, Sublet V (2006) Safe lifting and movement of nursing home residents. <http://tinyurl.com/qgwox7t> (accessed 28 January 2015)

Defloor T, Bacquer D, Grypdonck MH (2005) The effect of various combinations of turning and pressure reducing devices on the incidence of pressure ulcers. *Journal of the American Geriatrics Society* 40(8): 747–58

Fragala G, Fragala M (2014) Improving the safety of patient turning and repositioning tasks for caregivers. *Workplace Health Saf* 62(7): 268–73

Fragala G, Pontaini-Bailey L (2003) Addressing occupational strains and sprains: musculoskeletal injuries in hospitals. *AAOHN J* 51(6): 252–9

Gonzalez CM, Howe CM, Waters TR, Nelson A (2009) Recommendations for turning patients with orthopaedic impairments. *Orthopaedic Nursing* 28(Suppl2): 9–12

Harber P, Billet E, Gutowski M et al (1985) Occupational low-back pain in hospital nurses. *Journal of Occupational Medicine* 27(7): 518–24

Henoch I, Gustafsson M (2003) Pressure ulcers in palliative care: development of a hospice pressure ulcer risk assessment scale. *Int J Palliat Nurs* 9(11): 474–84

Knibbe J, Friele R (1996) Prevalence of back pain and characteristics of the physical workload of community nurses. *Ergonomics* 39(2): 186–98

Marras W, Davis K, Kirking B, Bertsche P (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): 904–26

Metzler D, Harr J (1996) Positioning your patient properly. *Am J Nurs* 96(3): 33–7

McInnes E, Jammali-Blasi A, Bell-Syer S et al (2012) Preventing pressure ulcers—are pressure-redistributing support surfaces effective? A Cochrane systematic review and meta-analysis. *Int J Nurs Stud* 49(3): 345–59. doi: 10.1016/j.ijnurstu.2011.10.014.

Morrison RS, Meier DE, eds (2003) *Geriatric Palliative Care*. Oxford University Press, New York NY

National Consensus Project for Quality Palliative Care (2009) *Clinical Practice Guidelines for Quality Palliative Care*. <http://tiny.cc/dqdvsvx> (Accessed 22 January 2015)

Naylor WA (2005) A guide to wound management in palliative care. *Int J Palliat Nurs* 11(11): 572–9

Ochs RF, Horn SD, van Rijswijk L et al (2005) Comparison of air-fluidized therapy with other support surfaces used to treat pressure ulcers in nursing home residents. *Ostomy Wound Manage* 51(2): 38–68

Owen BD, Garg A, Jensen RC (1992) Four methods for identification of most back-stressing tasks performed by nursing assistants in nursing homes. *International Journal of Industrial Ergonomics* 9(3): 213–20

Owen BD, Fragala G (1999) Reducing perceived physical stress while transferring residents. *AAOHN J* 47(7): 316–22

Pompeii L, Lipscomb H, Schoenfisch A, Dement J (2009) Musculoskeletal injuries resulting from patient handling tasks among hospital workers. *American Journal of Industrial Medicine* 52(7): 571–8

Reifsnnyder J, Magee H (2005) Development of pressure ulcers in patients receiving home hospice care. *Wounds* 17(4): 74–9

Skotte J, Fallentin N (2008) Low back injury risk during repositioning of patients in bed: the influence of handling technique, patient weight and disability. *Ergonomics*, 51(7): 1042–52

Smedley J, Egger P, Cooper C, Coggon D (1995) Manual handling activities and risk of low back pain in nurses. *Occup Environ Med* 52(3): 160–3

US Bureau of Labor Statistics (2013) News Release USDL-13-2257 (2013) Washington, DC.

Whitney J, Phillips L, Aslam R (2006) Guidelines for the treatment of pressure ulcers. *Wound Repair Regen* 14(6): 663–79

Winkelmolen G, Landeweerd J, Drost M (1994) An evaluation of patient lifting techniques. *Ergonomics* 37(5): 921–32