

**Evaluation of Z-Slider for Lateral Patient Transfers, Repositioning,  
and Staff Musculoskeletal Injuries (Abstract)**

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There is an abundance of compelling evidence in the literature regarding the existence and magnitude of the problem of back injuries among nurses. Manual patient lifts and transfers are confirmed high-risk activities for injury among nurses (Yassi et al., 1995), and nurses are exposed to high risk patient handling tasks at a high frequency (Fragala et al., 2005). In an overview of the problem, Hignett (1996) highlighted the fact that back pain in nurses is underreported, that the occurrence of back pain is higher among nurses than in other occupations, that the frequency of patient handling is positively correlated with prevalence of back pain, and that tasks known to exert high spinal loads are linked with a higher incidence of musculoskeletal injuries. Nurses working in certain subspecialties such as orthopedics, extended care, geriatrics, and neuroscience tend to have higher rates of back injuries (Hignett, 1996; Yassi et al., 1995). Physical and biomechanical gender differences place women at a higher risk of back injury (Marras, et al., 2002; Owen & Garg, 1991), a finding which is significant in light of the fact that the majority of nurses are female. Lifting standards applied to warehouse workers are inappropriate for application to patient handling tasks (Hignett, 1996), yet many healthcare institutions rely on these standards when determining patient handling policies and procedures.

Ergonomic interventions, such as altering the physical demands of a task by substituting equipment for the back muscles of nurses, can decrease the risk of back injuries (Owen & Garg, 1991; Yassi et al., 2001). Comprehensive ergonomics-based programs involving provision of, access to and administrative support of the use of appropriate patient mobility equipment can

result in dramatic costs savings associated with decreased injury rates and fewer lost work days (Nelson et al., 2006).

Bed boost, or the act of pulling a patient up to the head of the bed, is a frequently performed patient handling task (Fragala et al., 2005) which is perceived by nurses to be one of high physical stress (Owen and Staehler, 2003). Spinal loads during bed boosts performed using standard manual handling techniques, such as with a drawsheet, have been shown to be unsafe and to predispose the caregiver to a high risk of low back injury (Marras et al., 2000). Use of friction reducing devices for horizontal lateral transfer is associated with significantly reduced perceived physical stress on the part of nurses (Owen, 2000; Pellino et al., 2006), and with lower measured spinal forces (Lloyd & Baptiste, 2003; Nelson et al., 2003). Friction reducing devices for lateral transfer are recommended as key components of a minimum essential equipment list for clinical environments engaging in patient handling activities (Hignett, 2003), and are cited as a cost-effective means of reducing injury potential (Nelson et al., 2003).

The current study evaluated the effectiveness of the Z-Slider Patient Transfer Sheet as an aid for lateral horizontal transfers and bed boosts, and looked at its impact on the occupational injury rate of nursing personnel at Stanford Hospital and Clinics. The study took place over a 6 month period. Using a pre-post intervention survey design, data were obtained from independent convenience samples on three nursing units, and from institutional occupational injury records.

Following its introduction, data revealed that the Z-Slider was the most commonly used method of lateral horizontal transfer on the study units but was not generally being used for bed boosts. After introduction of the Z-Slider, there was a statistically significant decrease in the number of staff used for lateral horizontal transfers for patients weighing up to 150 pounds ( $P = .03$ ) and 150 to 200 pounds ( $P = .045$ ).

Subjects who had use the Z-Slider were asked to rate the following product features on a scale from 0 = very poor to 10 = excellent: (a) overall comfort while using the product; (b) impression of the product's overall ease of use; (c) the product's efficiency in use of the respondent's time; and (d) how safe the respondent felt the product was for patients. The data indicated an overall above average satisfaction level with the product, with mean scores ranging from 6.57 to 7.57. There were no staff-reported self or patient injuries associated with the device.

Due to the relatively short period of the study, no conclusions could be drawn regarding the Z-Slider's impact on occupational injury rates. Collection of longitudinal occupational injury data should continue. Further investigation is needed to determine why the Z-Slider was not being used for bed boosts. Recommendations for future research include controlled laboratory investigations to measure biomechanical forces associated with the Z-Slider and to compare the device with other methods of lateral horizontal transfer and bed boost.

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