The Effects of Sitting on a Mechanical Lift Sling on Interface Seat Pressure

A Pilot Study

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Purpose: To investigate the impact of sitting on mechanical lift slings on seat interface pressure of older adult wheelchair users.

Subjects: Twenty-two long-term care community-dwelling older adults (mean age = 80 years, SD = 9.76 years).

Methods: Within-subjects observational study of wheelchair-seated subjects with and without a mechanical lift sling.

Results: No statistically significant differences in pressure parameters were found.

Conclusions: Further investigation of the impact of sitting on mechanical lift slings in wheelchairs is warranted. The result of this study does not provide compelling evidence to overturn the current clinical recommendation of sling removal for long duration sitting.

Key words: long-term care, pressure ulcer, risk management, wheelchairs

The proliferation of “no-lift” policies in long-term care facilities over the last decade has introduced multiple benefits related to staff safety; however, these policies and the resulting increased use of mechanical lifts for resident transfers have added a potential risk factor related to pressure ulcer development among residents. On the basis of OSHA guidelines for workplace safety and in some cases state regulations, long-term care facilities have been moving toward broader use of mechanical lift systems for any resident requiring more than a minimal amount of assistance to transfer from bed to chair or toilet. It is common for facility staff to leave residents seated on the slings used to perform the transfer. Despite the availability and common use of removable transfer slings, it is often seen as a burden to remove these slings from under the resident and need to replace them for the next transfer. In addition, for some residents, it may be more difficult to position the slings once the resident is seated in a wheelchair and this difficulty may lead to suboptimal sling positioning that decreases the safety of the transfer itself.

It is a very reasonable clinical hypothesis that any item of clothing or equipment that is placed between the resident and the seat cushion will have some effect, likely to decrease the effectiveness of the pressure management properties of the cushion itself. However, it is unclear what the additional risks may be for residents who remain seated on these mechanical lift slings over long durations. Although mechanical lift slings have not been directly studied in seat interface pressure research, the negative effects of clothing or other materials placed between a person’s buttocks and a seat cushion have been recognized by researchers. Related research has examined the effects of incontinence pads on interface pressure in beds. In this small study, Fader et al found that the use of these garments, either wet or dry, negatively impacted interface pressure with bed mattresses.

The size of the population of long-term care residents affected by this risk factor is unknown and may be quite large. Data for wheelchair use among long-term care residents are not collected in any deliberate manner; however, in a 2004 study of outcomes of seating in long-term care, the wheelchair-using population was estimated at 600,000. In addition, according to data from the Survey of Income and Program Participation, June-September 2005 and May-August 2010, there are an estimated 3.6 million community-dwelling Americans who use wheelchairs for mobility. Many of these individuals may also be affected as the proliferation of mechanical lift usage certainly extends to private homes.

One of the more common and serious sequelae of wheelchair use is the development of pressure ulcers. Pressure ulcers are most commonly attributed to the presence of sustained pressure, particularly over bony prominences or in high-risk areas. One probable mechanism for the development of pressure ulcers involves “…sustained deformation of deep soft tissues under bony prominences, as a result of prolonged pressure of the bone on these soft tissues.” Health care system costs associated with...