

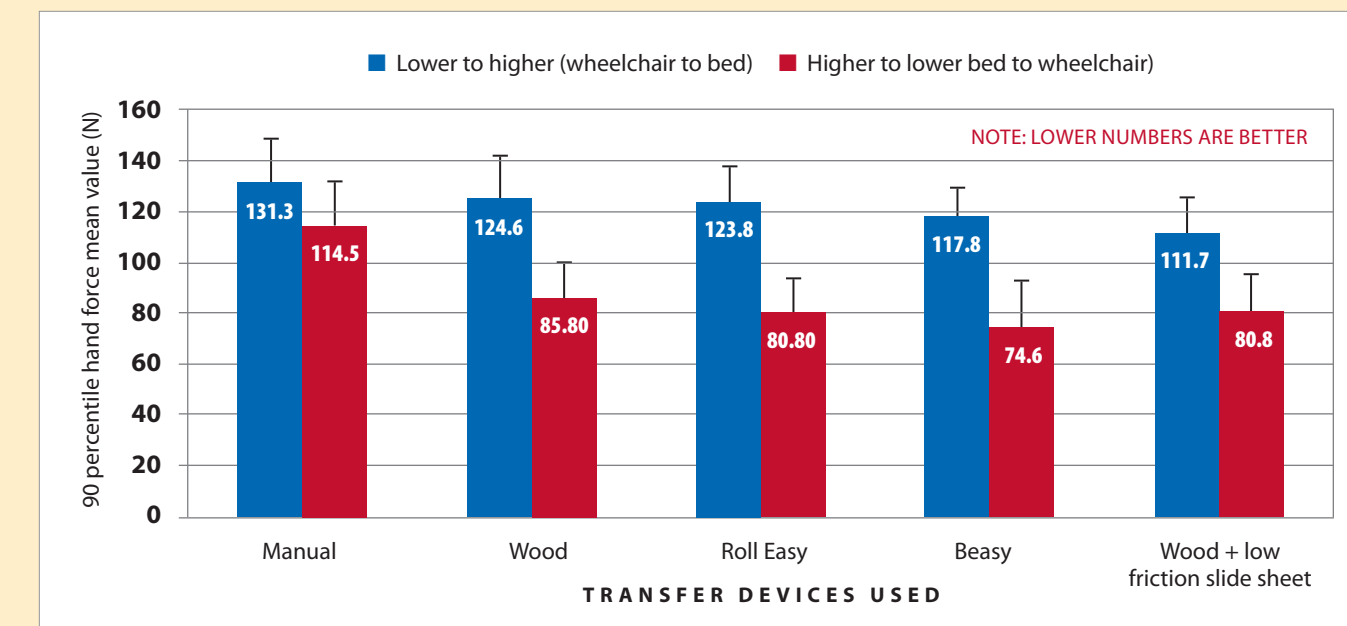
Findings

Quantitative measures for judging the transfer methods

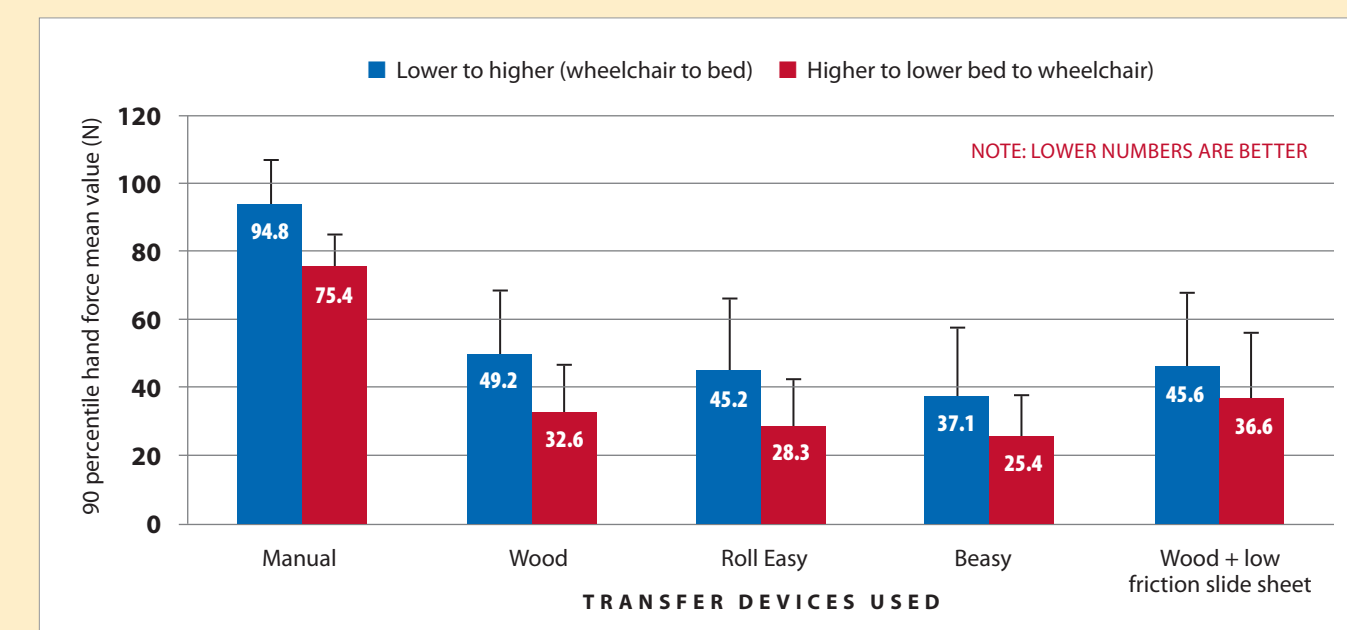
- Hand forces applied by the aide to perform the transfer. Less force is better.
- Lower trunk flexion velocities during the transfer. This is a combination of speed and flexing of the trunk. Lower velocity transfers are better.

The hand force summary

Compared to the manual transfer, all board types reduced the required hand force both for the leading and supporting hand. Moving the client from a higher to lower position was notably easier (less forceful) than moving the client upwards.



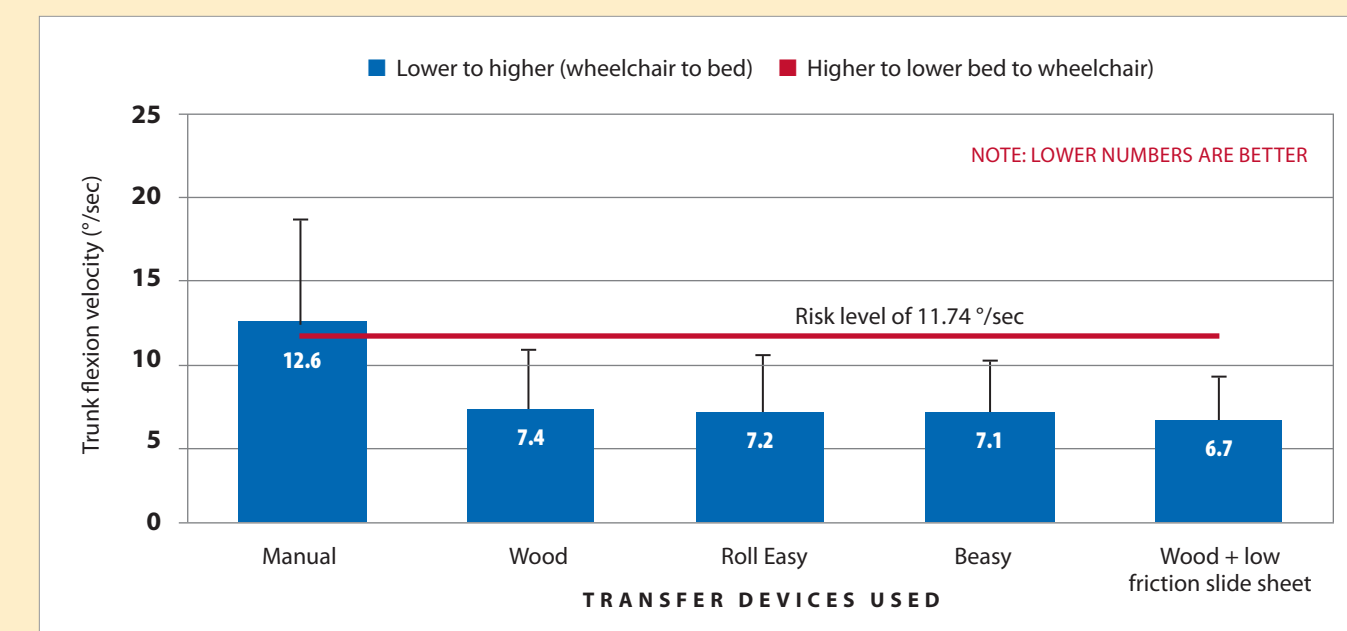
The leading hand
(lower to higher, n=15; higher to lower, n=14)



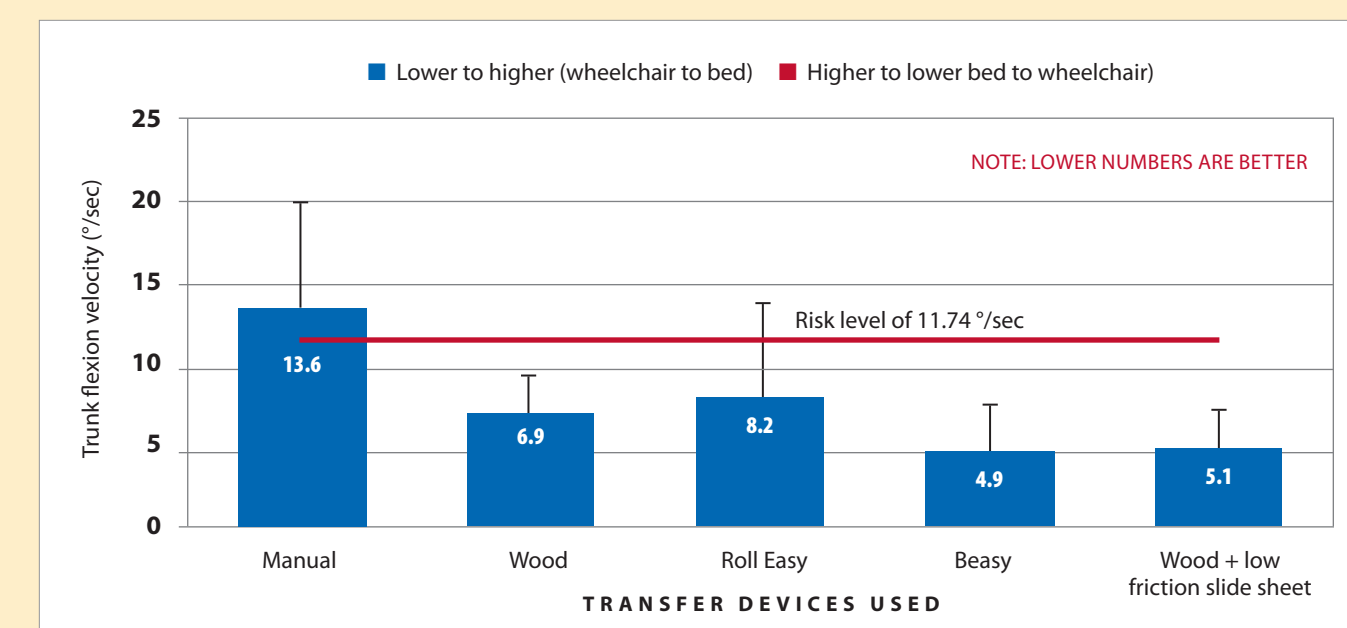
The supporting hand
(lower to higher, n=15; higher to lower, n=14)

Posture dynamics summary

Compared to the manual transfer, all board types improved the posture by reducing the trunk flexion velocity. All board-assisted transfers kept the trunk flexion velocity below the risk level of 11.74°/sec (Marras et al., 1993).*



Mean trunk flexion velocity when moving from a lower to higher position
(wheelchair to bed, n=15)



Mean trunk flexion velocity when moving from a higher to lower position
(bed to wheelchair, n=15)

* Marras, W. S., Lavender, S. A., Leurgans, S. E., Rajulu, S. L., Allread, W. G., Fathallah, F. A., & Ferguson, S. A. (1993). The role of dynamic three-dimensional trunk motion in occupationally-related low back disorders. The effects of workplace factors, trunk position, and trunk motion characteristics on risk of injury. Spine, 18(5), 617-628.

Safe Home Care PROJECT



Evaluation of Transfer Boards in a Simulated Home Care Setting

Background. Because manual client/patient transfer is a hazardous task, the Safe Home Care Project investigated in a laboratory setting whether low-tech transfer boards could be considered as a viable intervention in home care. This study was supported with funding from the National Institute for Occupational Safety and Health (NIOSH) 5R01OH008229.

Objective. To determine whether the slide board-assisted transfers reduce physical workload compared to a manual transfer, this study:

- evaluated two client transfer tasks,
- compared three different transfer boards and manual transfer, and
- evaluated combining a board transfer with a low-friction durable transfer sheet.

Methods. A simulated home care environment was designed in a UMass Lowell biomechanics laboratory. This consisted of a bed and wheelchair with removable armrest and footrest. The surface of the bed was 3.5 inches higher than the wheelchair seat. Both the height of the bed and wheelchair were non-adjustable. The client wore a gait belt

with handles. Sixteen (16) home care aides performed two client transfer tasks: (i) from bed to wheelchair [higher to lower], and (ii) from wheelchair to bed [lower to higher].

For each of the two tasks, the aide performed one manual transfer and four board transfers. The board transfers were performed by grasping the client's gait belt and sliding the client across the board between bed and wheelchair. During the transfer, the aide's leading hand horizontal-pulled the client, while the supporting hand also pulled and stabilized the transfer. A Safe Home Care staff member performed as "the client" during the study.

To measure the muscle activity during the transfer tasks, all home care aides had electrodes attached to the skin of the lower back and shoulder. To measure the posture dynamics, the aides wore a lumbar motion monitor. The client transfer tasks were performed with the following devices. At the end of the tasks, aides completed a brief survey on how easy each device was to use.



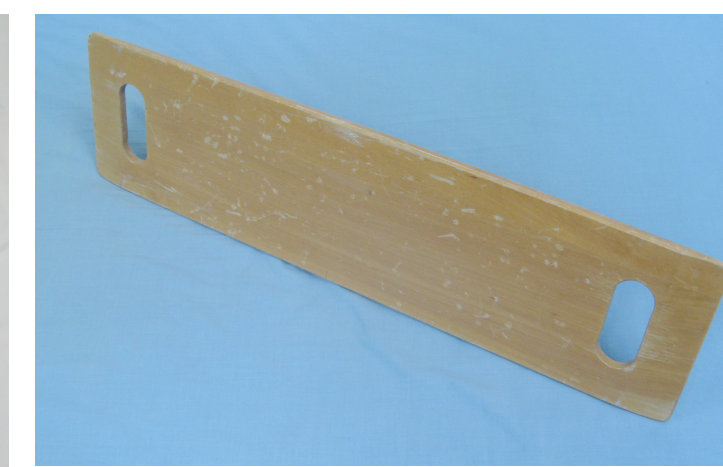
Gait Belt



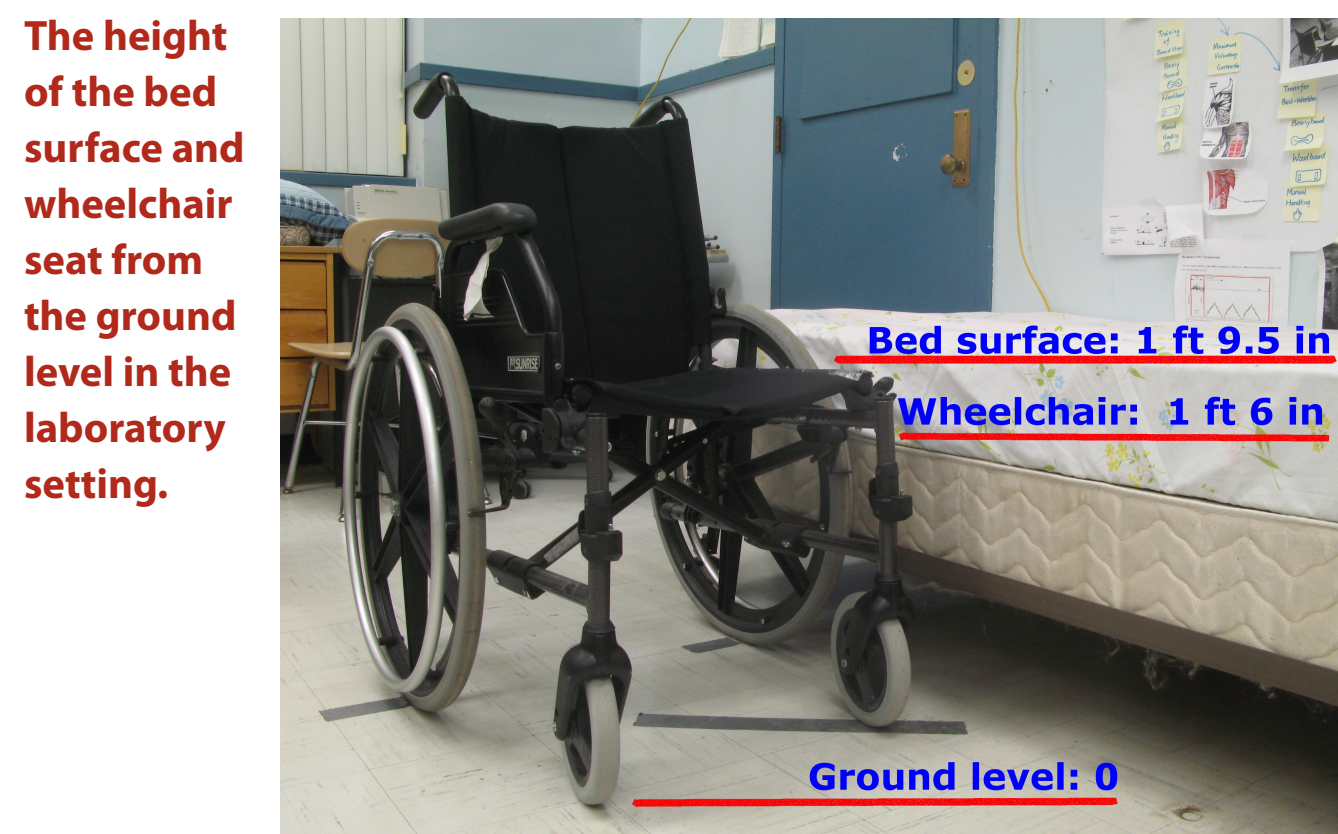
Beasy Board



Roll Easy Board



Wood Board
with and without low-friction material



The height of the bed surface and wheelchair seat from the ground level in the laboratory setting.



The participants had electrodes attached to the skin of the lower back and shoulder to measure the muscle activities. They also wore a lumbar motion monitor to measure the posture. This photo shows a manual transfer.

Conclusions & Recommendations

Transfer boards reduced the forces needed for moving clients. Moving the client from a higher to lower position was notably easier (less forceful) than moving the client upwards.



Of all transfer boards, the Beasy Board was most preferred by the home care aides and client for the following reasons:

- Least amount of force required compared to other board types and manual transfer.
- Easy to position under the client.
- Shape most preferred by home care aides.

Compared to manual handling, all board types reduced the hand force and improved the posture dynamics. It is always less strenuous to transfer a client from a higher to a lower position; therefore, an adjustable bed is valuable to so that transfers can always happen from high to low. Removable armrests and foot rests allow for positioning the wheelchair at a proper angle to the bed and placing of a transfer board conveniently between the wheelchair and bed.

Training and practice on transfer board use is necessary so that the board user takes full advantage of sliding rather than lifting the client. Furthermore, briefly crossing the client's leg (i.e. lifting the leg closest to the slide board over the other leg) seemed to help with positioning the board under the client. Finally, the transfer board users need to apply principles of proper body mechanics to reduce the force on the low back (i.e. keeping the back straight, bending at the knees, and holding the client as close as possible).

Before purchasing a transfer board, it is good to consider the following:

- Is the board easy to use?
- Is the board thin enough and easy to position under the client?
- Is the board easy to clean?
- Is the board safe for the aide and the client?
- Is the board stable but not too heavy?
- Is board material low friction and durable?

Important lessons learned from the study

- Compared to manual handling, all tested boards reduced required hand forces during the client transfer tasks and improved body posture dynamics.
- The most preferable board type according to the study participants was the Beasy Board.
- A low-friction sheet of plastic material placed on the surface of the plain wood board reduced the physical workload of the board transfer.
- It is less strenuous to transfer a client from high to low position. For example, an adjustable bed is useful to adjust surfaces so that transfers happen from a higher to lower position.