

Shoulder Preservation after SCI: Transfers

Author: Craig Newsam, PT, DPT
Edited from SCI SIG newsletter article by: Kendall Hart, SPT

Fact Sheet

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Contact us:

ANPT
5841 Cedar Lake Rd S.
Ste 204
Minneapolis, MN 55416
Phone: 952.646.2038
Fax: 952.545.6073
info@neuropt.org
www.neuropt.org

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Risk with Transfers

Transfers create a risk for upper limb pain because of the high loads as well as the potential for injurious limb positioning. This is particularly true for individuals with tetraplegia who lack strength of key muscles (such as sternal portion of *Pectoralis major*, *Latissimus dorsi*, and *Triceps*).¹ Additionally, as the height differential of the transfer increases during tub, car, and floor transfers, the shoulders experience a greater demand and more extreme ranges of motion.

Movement Optimization Strategies

- Make the height between transfer surfaces as level as possible. An interim level to complete the transfer (e.g., initially transferring to a low stool for floor to chair transfer) may help with large differences in height in order to avoid extreme bilateral shoulder extension. See Figure 1 for example.
- Place transfer surfaces as close together as possible.
- Avoid the extreme positions of shoulder abduction and internal rotation during weight bearing, particularly when the transfer surfaces are far apart such as during car transfers.
- Avoid positions of extreme wrist extension by weightbearing on the fist with a neutral wrist during transfers, if upper extremity strength allows.
- The direction of transfers presents different demands on the two arms. One of two strategies is recommended:
 - In a person with an existing unilateral shoulder problem, transfer toward the painful shoulder because of the greater muscular response of the large thoracohumeral muscles which may protect glenohumeral joint integrity.²
 - In people with bilateral shoulder dysfunction or for general joint preservation, vary the direction of transfers as often as possible.²



Figure 1: Transferring from floor to wheelchair with an interim surface to avoid extreme shoulder positioning

Adaptive Equipment Strategies

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Transfer boards:

- Consider using transfer boards – even when a lateral transfer may be possible – to allow the transfer to be completed in multiple steps, particularly for complex transfers or in the context of shoulder dysfunction.
- Transfer boards can be simple or more complex to allow greater ease of transition between surfaces. Transfer boards with varying length, material, shape, or number of grip handles are available to accommodate a wide variety of patients' abilities and situations.

Wheelchair Configuration:

- A forward wheel position, while optimal for propulsion mechanics, may make transfers more challenging as the wheel represents another challenge to negotiate.
- An inclined seat (i.e. bucketing), which may aid in sitting stability, will make a transfer from the wheelchair essentially an uphill task.

Mechanical Lifts:

- Mechanical lifts are generally recommended for individuals who are unable to safely transfer independently or with assistance.
- Also, consider mechanical lifts as a reasonable transfer method in order to preserve shoulder function, especially in the presence of shoulder pain and/or injury.

References:

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