



# Recommendations for Vertical Transfer of a Postoperative Total Hip Replacement Patient (Bed to Chair, Chair to Toilet, Chair to Chair, or Car to Chair)

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Vertical transfers of postoperative orthopaedic patients pose a high risk to healthcare workers for developing work-related musculoskeletal disorders. The task is considered high risk based on weight limits and awkward positioning. A task force including representatives from the National Association of Orthopaedic Nurses, the American Nurses Association, the National Institute for Occupational Safety and Health, the Patient Safety Center of Inquiry at the James A. Haley Veterans Administration Medical Center in Tampa, Diligent Services, and Guldmann, Inc., developed an ergonomic tool for determining best practices for safe vertical transfers. Current concepts of ergonomic safety, scientific evidence, and safe patient-handling equipment and devices were incorporated into this ergonomic tool.

In the National Association of Orthopaedic Nurses (NAON) guidance statement on safe patient handling and movement in the orthopaedic setting, the process for developing algorithms based on high-risk tasks was described. The NAON guidance statement was developed in order to provide evidence-based and practical ergonomic methods for safe handling of orthopaedic patients to prevent injuries to nurses, patients, and healthcare personnel (Sedlak, Doheny, Nelson, & Waters, 2009). This article describes the projected ergonomic solutions for Algorithm No. 2: Vertical Transfers of a Postoperative Total Hip Replacement Patient (Bed to Chair, Chair to Toilet, Chair to Chair, or Car to Chair).

## Background

Vertical transfers of postoperative total hip replacement patients in multiple positions were identified as a high-risk task that could lead to the development of musculoskeletal disorders (MSDs), such as low back and shoulder injuries. Vertical transfers are defined as trans-

fers in which the patient starts and ends in a seated position, such as a transfer from bed to chair, chair to toilet, wheelchair to bedside chair, or car to wheelchair (Nelson, 2006). In caring for the postoperative total hip replacement population, patients, as part of their rehabilitation routine, may be assisted to vertical transfer positions multiple times per day; thereby exposing the healthcare worker to this high-risk task frequently and increasing the chance for developing MSDs. The necessity of needing to maintain hip alignment precautions for total joint replacement patients can lead to awkward positioning of the nurse or ancillary healthcare worker. In addition, the patient's condition, that is, weight, the need to support the affected extremity, or level of pain, may add risk to this task.

The goal of the transfer is to move the patient from a supine to a seated position or from a seated position to another seated position in another location. The transfer requires using additional assistive devices, such as walkers, canes, and crutches, and may often require the

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**FIGURE 1.** Bed to Chair transfer. *Note:* Therapist on the right has to reach over furniture to assist the patient leading to a potential for injury.

assistance of two or more people depending on the ability of the patient to bear weight or move his or her affected extremity. This transfer may also require a combination of lifting, pushing, and pulling toward the transfer site. Healthcare personnel may be required to reach over a surface to another surface, that is, bed to chair; this can lead to excessive pushing and pulling forces. An example of this high-risk task is shown in Figure 1. The high risks can be aggravated when there are differences in the height of the team members performing the tasks or if the patient is uncooperative. The ergonomic tool for

vertical transfer of a total hip replacement patient presented in this article provides ergonomic and evidence-based content to assist orthopaedic nurses and other team members in vertically transferring postoperative total hip replacement patients in a safe manner.

## Rationale for the Tool

Orthopaedic nurses spend much of their time assisting total joint replacement patients with transfers with the understanding that movement and ambulation is essential to increase bone healing postoperatively and decrease the risk of developing complications such as deep vein thrombosis, pneumonia, and/or pressure ulcers. The high frequency of these tasks can subsequently lead to the development of MSDs (Nelson, 2006).

The movement of the patient to the different location must take height and position into account. The height of an automobile can affect the angle of the patient's hip and the space often encountered with rotation into a car can affect the transfer techniques utilized with a total hip replacement patient. Cars transfers should utilize all the features of the car, for example, seat adjustability, to assist with movement. Chair and toilet heights must also be evaluated, as they should be at a height to prevent increased flexion of the hip to prevent the possibility of hip dislocation in the first 6 weeks of postoperative recovery (see Figure 2A–D). The possibility of utilizing a chair that could bend into a stretcher position may facilitate a bed to chair transfer (Nelson, 2006).



**FIGURE 2A–D.** Transfer from bed to bedside commode using gait belt.



**FIGURE 3A–B.** Patient is able to assist and partially weight bear using gait belt for assistance.

When transferring a patient vertically, caregivers must exert sufficient force to lift and turn a patient to a new location. The maximum recommended weight limit for lifting is 35 lb; for most patient-lifting tasks, this weight limit decreases when performing activities in a restricted space and when lifting with the trunk twisted or the load off to the side of the body (Waters, 2007). Healthcare workers need to evaluate the patient to determine the amount of assistance that the patient will need for transfer. If the healthcare worker estimates that the patient will require assistance by the healthcare worker to lift greater than 35 lb, then a manual lift should not be attempted (see Figure 3A–B).

Weight-bearing status is important to evaluate in the vertical transfer patient. The ability of the patient to be able to assist may be dependent on the amount of weight he or she is able to exert on the affected extremity. Weight bearing can be defined as follows:

- *Non-weight bearing:* No weight is borne by the affected limb.
- *Touch-down weight bearing:* The foot makes contact with the floor but no weight is borne.
- *Partial weight bearing:* The client bears a percentage of weight less than 100% on the affected extremity. The specific percentage is dictated by the orthopaedic surgeon.
- *Weight bearing as tolerated:* The amount of weight borne on the extremity is dictated by the client's pain tolerance.
- *Full weight bearing:* The client bears weight fully on the affected extremity. (Maher, Salmond, & Pellino, 2002)

The inability of patients to weight bear can lead to the need for the utilization of the mechanical device. In addition, the patient's ability to cooperate needs to be evaluated to determine the use of mechanical technology (see Figure 4).

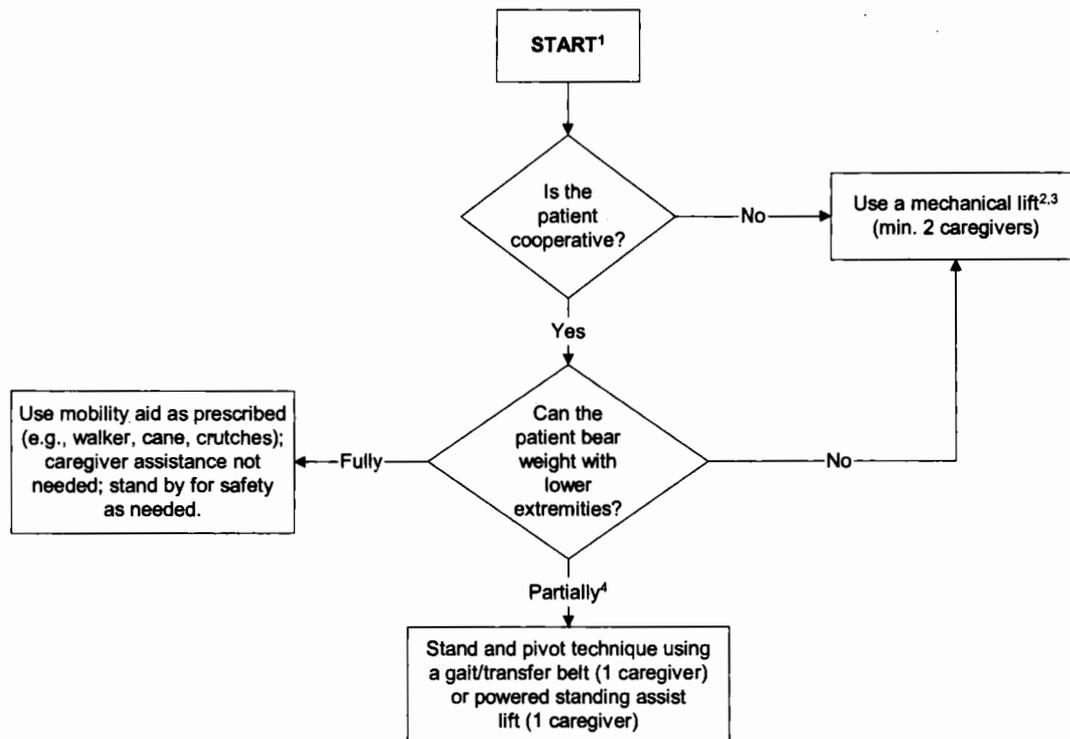
### Description of the Tool

The NAON recommendation for vertical transfer of a postoperative total hip replacement patient (bed to chair, chair to toilet, chair to chair, or car to chair) is shown in Algorithm 2 (see Figure 5). Movement of the

patient may be accomplished using different techniques to position the patient at the side of the bed. Patients should be evaluated to determine their ability to shift their weight while seated and encouraged to move forward by unweighting one buttock and moving it toward the edge of the bed until the patient is at the edge of the bed. Another technique that could be utilized is to support the impaired extremity while the patient attempts to move to the edge of the bed as above. If the patient is unable to move independently, the caregiver needs to evaluate whether he or she will need additional assistance based on weight to be mobilized. If the weight exceeds 35 lb, then a mechanical lift should be used. Care should be taken to decrease friction and shear on the patient's skin when moving the patient. According to the algorithm, there needs to be a determination of the patient's ability to cooperate. If he or she is not cooperative, then the use of a mechanical device or bed-assisted technology should be considered. Cooperation of the patient should be estimated by evaluating sudden movements, especially in patients who may have other underlying conditions, that is, neurologic conditions. Cognitive conditions can also affect the patients' capacity to cooperate with transfers. Patients with cognitive impairments may have difficulty following instructions and may resist care and/or exhibit combative



**FIGURE 4.** Patient transfer utilizing partial weight bearing stance.



**FOOTNOTES:**

1. See 1A, 1B, 1C, 1D below for techniques to position patient at side of bed.
  - 1A. Moving from supine head of bed elevated to sitting at edge of bed requires: Patient's ability to shift their seated weight in a sitting position. Typically accomplished by unweighting one buttock and moving it toward the edge of the bed; repeating this in alternating fashion until patient is sitting at edge of bed.
  - 1B. With an impaired upper or lower extremity, caregiver might need to support the limb while patient attempts No.1A.
  - 1C. If patient is unable to accomplish No.1A with No.1B and the amount of assistance from caregiver will exceed 35 lb., then a mechanical lift device should be used to achieve sitting position at the edge of the bed.
  - 1D. Antifriction sheets and seated discs might be useful when the amount of caregiver assistance is close to recommended limits; be aware of skin shearing risks. Shearing forces are caused when there are two forces moving in opposite directions adjacent to each other (like scissors).
2. Maintain orthopaedic precautions as prescribed while performing this activity such as total hip, knee, shoulder, or spine precautions.
3. Select sling to meet and maintain the patient's pre-op or post-op positioning guideline/precautions for the affected limb/body part(s). For more information on sling selection, see Appendix A.
4. This will include situations where the patient may be allowed: (a) Limited weight bearing on one lower extremity and full weight bearing on the other extremity; (b) Partial weight bearing through both lower extremities.

**GENERAL NOTES:**

- If patient has partial weight bearing capacity, transfer toward stronger side.
- For car transfers: a) If patient cannot tolerate a seated position when doing a car transfer use a stretcher transfer or alternative transportation may be required; (b) all car transports should comply with state laws for both children and adults; c) Don't forget to use all of the features of the car (i.e., adjustability of the seat) during the transfer.
- The height of the bed should be appropriate for staff safety (at elbow height).
- During any patient handling task, if the caregiver is required to lift more than 35 lb/(16 kg) of a patient's weight, then the patient should be considered fully dependent and an assistive device should be used. (Waters, 2007)

**FIGURE 5.** Orthopaedic Algorithm 2: Vertical transfer of a postoperative total hip replacement patient (bed to chair, chair to toilet, chair to chair, or car to chair).

behaviors, which increases the risk to the caregiver (Nelson, 2006). In the event that the patient may be uncooperative, a minimum of two caregivers is needed to move the patient and utilize a mechanical lift while maintaining total hip precautions. Total hip precautions include the following:

- *For anterior total hips:* No active abduction; no outward extension of the affected extremity; and no backward extension of the surgical leg (no crossing of the leg).
- *For posterior total hips:* No bending the affected hip beyond a 90° angle; no crossing of the legs; no

inward rotation of the toes on the affected extremity (Maher, Salmond, & Pellino, 2002).

If the patient is cooperative, then weight bearing needs to be evaluated. On the basis of weight-bearing situation, the patient can be transferred accordingly. Patients with full weight-bearing status must use mobility aids as prescribed with standby assistance for safety as needed. If the patient is able to partially weight bear, that is, limited weight bearing on one lower extremity and full weight bearing on the other extremity or partial weight bearing through both lower extremities, then the stand and pivot technique using a gait or transfer belt or

powered standing assist lift with one caregiver assist would be recommended.

## Summary/Conclusions

A vertical transfer of a postoperative total joint replacement patient is a task identified by NAON's membership as a high-risk patient-handling task. The forces exerted in transferring these patients can cause damage to caregivers that can lead to musculoskeletal injury. It is important to determine tasks that can be performed mechanically rather than relying on outdated, unsafe manual patient-handling methods. The algorithm presented provides a guide for determining the safest transfer method that accounts for the special clinical needs of postoperative total joint re-

placement patients. The caregiver should utilize this tool along with professional judgment in caring for such patients.

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