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Safe Ambulation of an Orthopaedic Patient

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Nurses and other caregivers face high risk for developing work-related musculoskeletal disorders associated with manual ambulation of patients with orthopaedic conditions. In addition to the physical demands needed to support the patient's weight during ambulation, injury risk increases if the patient falls. A task force including representatives from the National Association of Orthopaedic Nurses, American Nurses Association, National Institute for Occupational Safety and Health, and Patient Safety Center of Inquiry at the James A. Haley Veterans Administration Medical Center in Tampa developed an ergonomic tool for determining best practices for safe ambulation of orthopaedic patients (C. A. Sedlak, M. O. Doheny, A. Nelson, & T. R. Waters, 2009). Scientific evidence, concepts of ergonomic safety, and safe patient-handling equipment were incorporated into an ergonomic tool designed to increase safety and reduce unnecessary variation in practice associated with this high-risk patient-handling task (National Institute for Occupational Safety Health, 1997; National Research Council/Institute of Medicine, 2001; A. Nelson, 2006; T. Waters, 2007).

National Association of Orthopaedic Nurses (NAON) has developed a guidance statement on safe patient handling in an orthopaedic setting. The development process for the NAON guidance statement has been described in a previous article (Sedlak, Doheny, Nelson, & Waters, 2009). The NAON guidance statement was developed to identify the unique high-risk patient-handling tasks in orthopaedic settings and provide evidence-based solutions for reducing the risk of each task identified. This is the fourth in a series of articles presenting high-risk orthopaedic tasks and outlining ergonomic solutions. This article will focus on NAON Orthopaedic Algorithm 4: Ambulation (see Figure 1).

Background

A NAON survey of orthopaedic nurses identified the task of ambulating orthopaedic patients as high risk for developing work-related musculoskeletal disorders (MSDs) (Sedlak et al., 2009). This tool for assessing the ambulation task considers safety for the caregiver and the patient and provides evidence-based guidelines to assist the orthopaedic team members in ambulating a patient in a safe manner.

Ambulation Task

Patients with mobility impairments may need assistance in ambulation. Assisting a patient to ambulate is considered a high-risk task because of physical demands associated with weight support, as well as sudden movements associated with loss of balance or a fall, creating excessive loads on the soft tissues of the spine. These forces are above the National Institute for Occupational Safety and Health (NIOSH) recommended limits for caregivers and may lead to pain, injury, or permanent disability (Waters, 2007). Therefore, it is important to determine when ambulation should be performed with manual assistance versus patient-handling technology.

Traditionally, ambulation has been carried out with gait belts and ambulation devices such as walkers and crutches. The caregivers perform bending, pulling, and lifting as they assist the patient to a standing position. The caregiver may have to advance the ambulation device or pull along a wheelchair as well as support the patient. This may require the caregiver to hold the patient

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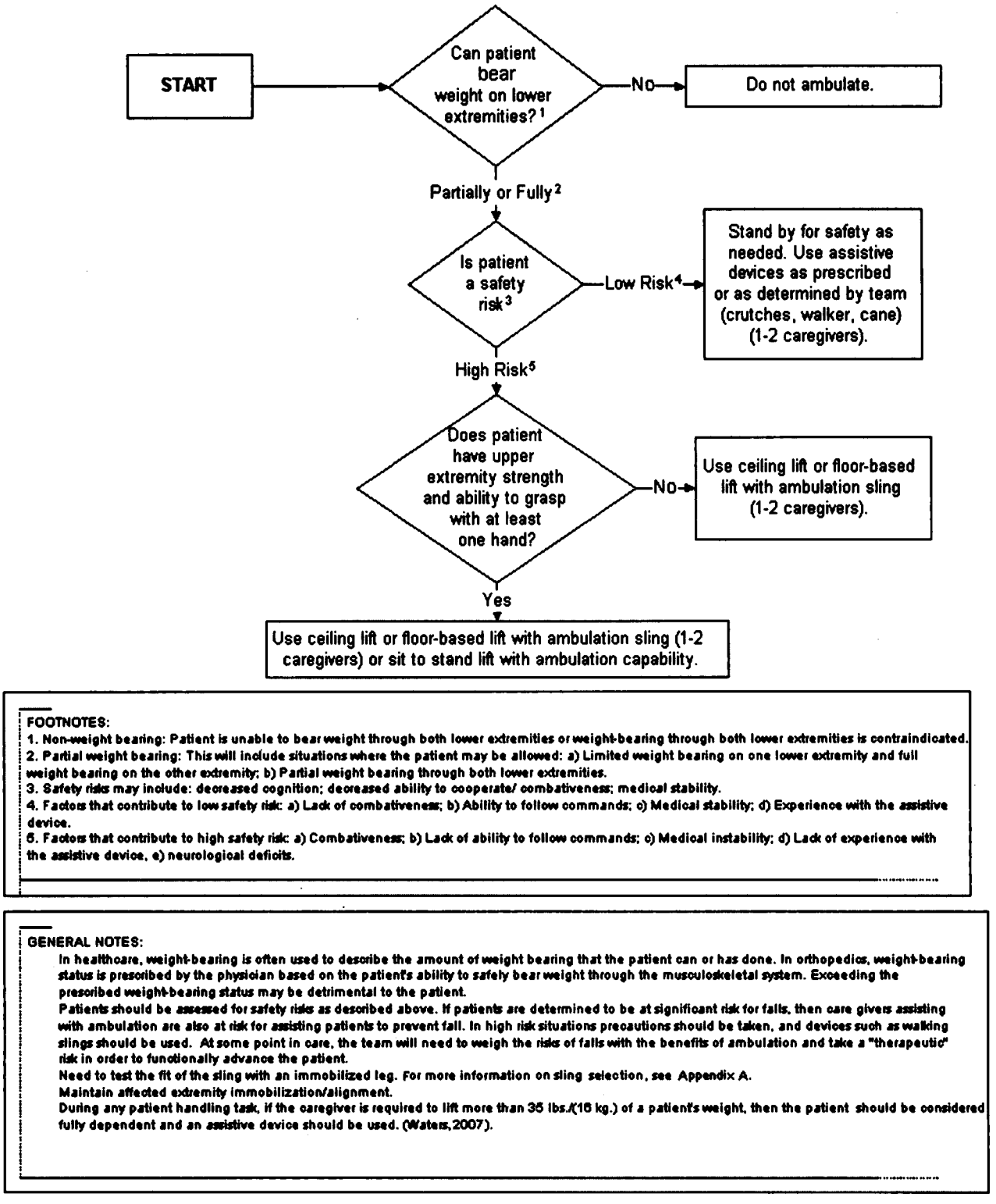

FIGURE 1. Orthopaedic Algorithm 4: Ambulation.

up with the gait belt in one hand while bending and pulling the chair along with the other hand. The patient may also require assistance for advancing a walker or other ambulation devices. At times, two caregivers are available to assist with ambulation, but often a single caregiver performs all of these tasks. The risks are magnified if there are other devices such as intravenous poles or catheters that need to be towed and monitored, as this diverts the caregiver's attention and hands from the ambulation task.

THERAPEUTIC BENEFITS OF AMBULATION

Ambulation of patients is a necessary component of care in the orthopaedic setting and may be performed many times during a typical work shift. Ambulation has been demonstrated to prevent serious postoperative

FIGURE 2. Manual ambulation assistance of partially dependent patient, with and without IV poles, chairs, etc.

FIGURE 3. Ambulation assistance of partially dependent patient with patient-handling technology.

medical complications of immobilization such as deep vein thrombosis (Ragucci, Leali, Moroz, & Fetto, 2003). In addition, many patients with orthopaedic injuries or procedures must learn to ambulate with assistive devices or with altered weight bearing. It is necessary for patients to have the opportunity to practice in order to increase their level of independence with ambulation.

Clinical Considerations in Ambulation of Orthopaedic Patients

The orthopaedic patient benefits from ambulation, but it is also important to consider orthopaedic precautions when making the decision on tools to assist with this task. Lifts and slings need to be evaluated for their ability to accommodate positional precautions, immobilized limbs, or external fixation devices.

It should be noted that ambulation is never entirely a risk-free activity. The level of risk should be carefully assessed as the effects of a fall within an orthopaedic population can be very damaging to the patient and the care provider who is attempting to prevent the fall. Despite the risk, at some point, the healthcare team will need to determine the appropriate time to begin ambulation without a supporting sling and lift in order to functionally advance the patient in this task.

Risks Associated With Ambulation

Risk of MSDs for this task is associated with the need to physically lift or help transfer the patient during the activity, which could create excessively high mechanical forces on the muscles and joints of the body, especially the low back. When the forces on the joints and other soft tissues are excessive, the risk of developing a work-related MSD is increased significantly (National Research Council/Institute of Medicine, 2001; NIOSH, 1997). Risk of injury is also increased because of patient obesity and uneven distribution of patient weight due to orthopaedic appliances, and the orthopaedic caregiver frequently works in situations where environmental barriers places the caregiver in awkward positions that further increase the risk to the caregiver such as narrow rooms that do not accommodate assistive devices or lifting devices.

When a caregiver ambulates a patient at risk for falls, there is risk for the patient as well as the caregiver. In the event that a patient starts to fall, the caregiver may attempt to support all of the weight of the patient to prevent the fall, resulting in high risk to the caregiver and the patient. According to the NAON recommendation, if the caregiver has a high likelihood of needing to lift more than 35 lb of a patient's weight during any aspect of ambulation, then assistive technology and one to two caregivers should be used for ambulation. This recommendation is based on a recent article describing a maximum recommended weight limit of 35 lb for patient lifting (Waters, 2007).

Patients should be evaluated for risk of falls using best practice models for risk assessment, especially with the elderly. Several fall risk assessment tools are available to quantify fall risk (Perell, Nelson, Goldman, Luther, Prieto-Lewis, & Rubinstein, 2001).

The patient's condition and dependency level may add complexity and risk to the task. The dependency level of the patient is critical in determining whether the task would likely be high risk for the caregiver; there is little risk of MSDs to the caregiver who is working with a fully independent patient. On the other hand, if the patient has difficulty weight bearing on the lower limbs, then the physical requirements needed to perform the activity increase dramatically for the caregiver, creating a potentially high-risk situation. The orthopaedic patient frequently has prescribed weight-bearing precautions of the lower extremities. Caregivers are required to assess the amount of weight bearing the patient is performing to ensure that no harm comes to the patient by bearing weight beyond the prescribed limits.

The patient may have other safety risk factors. These may include cognitive impairments, manifested by confusion, combativeness, or inability to follow simple commands. Medical treatments can also contribute to increased risk, including effects of anesthesia or medications, sleep deprivation, or fatigue. Furthermore, the caregiver needs to be aware of any comorbidities that

can lead to problems of spasticity common in patients with neurological conditions such as multiple sclerosis, cerebral vascular accident, cerebral palsy, and spinal cord injuries (Nelson 2006), as these can affect the risk associated with ambulation. Unpredictable movements can lead not only to caregiver injury but also to patient injury. Devices are available to assist with ambulation, but these devices may increase the risk if the caregiver lacks sufficient knowledge and skills in their use (see Figures 2 and 3).

Description of the Tool

NAON Orthopaedic Algorithm 4: Ambulation of an Orthopaedic Patient is shown in Figure 1. The tool first considers the ability of the patient to bear weight through the lower extremities. In a general sense, a patient may have limited ability to bear weight through one or both lower extremities because of muscle weakness. From an orthopaedic perspective, weight bearing refers to a patient's ability to safely bear weight through the musculoskeletal anatomy without causing harm. Both of these limitations in lower extremity weight bearing should be considered when using this tool.

Weight bearing is characterized by three levels, as defined below (Maher, Salmond, & Pellino, 2002):

1. *Non–weight bearing:* No weight is to be borne by the affected limb.
2. *Partial weight bearing:* A percentage of body weight less than 100% may be borne on the affected extremity. The specific percentage is dictated by the orthopaedic surgeon.
3. *Full weight bearing:* Full body weight may be borne on the affected extremity.

If weight bearing is contraindicated through both lower extremities, then ambulation should not be performed. If partial or full weight bearing of at least one lower extremity is deemed by healthcare professionals to be acceptable, then the caregiver follows the downward pathway of the tool.

Next, the caregiver assesses safety risks. As noted previously, risks for the patient directly impact safety to the caregiver. If a patient is not combative, has the ability to follow commands, is medically stable, and has experience with the ambulation device, then the ambulation task is considered low risk. The pathway to the right is followed. Ambulation may be performed with an ambulation device as determined by the orthopaedic team and the assistance of one to two caregivers. If the patient has one or more of the factors that contribute to risk, the patient is considered to be at high risk and the downward path is followed. Next, it is necessary to determine whether the patient has the ability to grasp with at least one hand. It is necessary to make this determination as most manufacturers of floor-based sit-to-stand lifts that convert to ambulation assist devices advise that the patient should have the ability to grasp firmly with at least one hand to safely use the lift. If the patient cannot grasp with at least one hand, the option for using the floor-based sit-to-stand lift is eliminated and a suspended walking sling with either a floor-based lift or a ceiling lift should be used to ambulate the patient. If the patient does have the ability to grasp with at least one hand, then the options for ambulation include sit-to-stand patient lift that converts to an ambulation device, as well as the previously noted options of suspended walking slings with ceiling-mounted patient lifts or floor-based patient lifts.

Summary/Conclusions

A task force including representatives from the NAON, American Nurses Association, NIOSH, and Patient Safety Center of Inquiry at the James A. Haley Veterans Administration Medical Center in Tampa has developed an ergonomic tool designed to assist the caregiver in determining when patient-handling equipment should be incorporated into ambulation in an orthopaedic setting, which includes recommendations for the number of caregivers needed to perform the task safely. Use of this tool is likely to increase safety for both the caregiver and the patient, while reducing unnecessary variation in practices.

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