
AORN Guidance Statement: Safe Patient Handling and Movement in the Perioperative Setting

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Description of the Problem

Perioperative registered nurses and the perioperative team are routinely faced with a wide array of occupational hazards in the perioperative setting that place them at risk for work-related musculoskeletal disorders.¹⁻³ Musculoskeletal disorders are injuries or disorders of the muscles, nerves, tendons, joints, cartilage, or spinal discs associated with actions such as overexertion, repetitive motion, and bodily reaction.^{4,5} The US Department of Labor does not include injuries caused by slips, trips, falls, motor vehicle accidents, or similar accidents in their definition of musculoskeletal disorders.⁴ Musculoskeletal disorders are one of the most frequently occurring and costly types of occupational issues affecting nurses.^{2,6,7} More than a third (ie, 36%) of the musculoskeletal injuries that nurses reported requiring time away from work were back injuries.⁸ Among the nurses working in the private sector, nearly 9,000 had back injuries.^{8,9} One study revealed that 12% of nurses planning to leave the profession indicated that back injuries were either a primary or contributing factor to their decision.¹⁰ While back injuries are one of the most common occupational injuries in the health care industry, injuries of the shoulder and neck were more likely to prevent nurses from performing their work than low back pain.¹⁰⁻¹³ The US Department of Health and Human Services report on nursing identified concern for personal safety in the health care environment as the reason given by 18.3% of nurses for leaving the profession.¹⁴

When the worker's physical ability, task, workplace environment, and workplace culture are not compatible, there is an increased risk of a musculoskeletal disorder.^{1,2,15} The connection between physical risk factors and musculoskeletal disorders is greater when exposures are intense and prolonged and when several occupational risk factors are present at the same time.¹⁶ Examples of physical stressors encountered in health care include

- forceful tasks,
- repetitive motion,
- awkward posture,
- static posture,
- moving or lifting patients and equipment,

- carrying heavy instruments and equipment, and
- overexertion.^{1-3,11,12,14,17-26}

The perioperative setting poses unique challenges related to the provision of patient care and completion of procedure-related tasks. This highly technical environment is equipment intensive and necessitates the lifting and moving of heavy supplies and equipment during the perioperative team member's work period. Many of the patients having surgical or other invasive procedures are completely or partially dependent on the caregivers due to the effects of general or regional anesthesia or sedation. Patients who are unconscious cannot move, sense discomfort, or feel pain, and they must be protected from injury. This may require the perioperative team to manually lift the patient or the patient's extremities several times during a procedure. The following are among the high-risk tasks specific to perioperative nurses identified that will be addressed in the following discussion of ergonomic tools:

- transferring patients on and off OR beds,²
- repositioning patients in the OR bed,²
- lifting and holding the patient's extremities,²
- standing for long periods of time,²
- holding retractors for long periods of time,²
- lifting and moving equipment,² and
- sustaining awkward positions.

Transferring, lifting, and handling patients has been identified as the most frequent precipitating trigger of back and shoulder problems in nurses.^{2,27} Certain patient handling tasks (eg, patient transfers) have been identified as high risk for musculoskeletal injuries to health care workers.²⁷ Lifting and moving patients is a frequent activity in the perioperative setting; for example, caregivers transfer patients to and from transport carts (eg, stretchers) and the OR bed many times during a typical work shift.

Health care providers often reposition patients once they are on the OR bed to provide appropriate exposure of the surgical site. This high-risk activity requires team members to physically lift and maneuver the patient or a patient's extremity while simultaneously placing a positioning device. The patient's weight may not be evenly distributed; the extremity's mass may be bulky and asymmetric, and it may be difficult to hold the extremity close to the health care

provider's body during positioning maneuvers.²⁸ Additionally, concern for the patient's airway, maintaining his or her body alignment, and supporting the extremities may make it difficult for team members to position themselves in an ergonomically safe position, thus exacerbating physical demands.

Several unique aspects of high-risk patient handling tasks associated with prepping a patient's limb have been identified.²⁹ Preparing an extremity for surgery generally requires it to be elevated to allow complete circumferential skin preparation. The limb can be suspended by a person holding the limb or by placing the limb in a holding device. In some instances, the limb may be held manually during the entire skin prep while a second person performs the skin prep. The person performing the skin prep may also hold the limb if the limb is small or if only the distal portion needs to be prepped. To maintain asepsis, the person lifting the extremity is forced to hold the limb extended away from his or her body. The size of the limb, length of prep time, posture necessary to hold the extremity, and the physical capability of the person holding the limb all contribute to the ability of the caregiver to safely suspend the limb for the required prep. The following questions should be considered when determining how to safely raise and hold a limb.

- Does the limb need to be raised for the entire surgical skin prep?
- Does the limb need to be lifted by scrubbed or unscrubbed personnel?
- Is the person holding the limb strong enough to perform the task?
- Is there an alternative practice that can be adopted?
- Is there equipment that could be used to support the task?
- Is it possible to hold a heavy limb safely without risk of injury to the nurse or the patient?²⁹

Perioperative registered nurses are prone to pain and fatigue from static posture during surgical procedures. The entire perioperative team spends a significant amount of time on their feet during the course of a shift; however, sterile perioperative team members may be required to stand for much longer periods of time. The sterile team members must maintain the integrity of the sterile field, which precludes them from changing levels. They should not alternate between sitting in a chair that is lower than the sterile field and a standing position. Acute and chronic back, leg, and foot pain are frequent complaints resulting from standing in one place for long

periods of time. The following factors should be considered during surgical or other invasive procedures. Are the sterile members of the team

- at the appropriate height for the level of the OR bed?
- adopting awkward positions to work effectively?
- positioned in close proximity to the patient to perform required tasks?
- stretching and relaxing muscles regularly?²⁹

Perioperative nurses and other perioperative personnel are frequently required to push or pull heavy equipment (eg, OR beds, portable microscopes, video carts). This equipment is very expensive and often must be shared between several individual operating rooms. Unoccupied OR beds are very heavy and difficult to move. Moving an occupied OR bed is not recommended because the risk of injury increases for both the worker and the patient.

Perioperative personnel and central processing personnel are frequently required to carry sets of surgical instruments. Instrument set weights vary and may weigh as much as 40 pounds. Instrument trays are wrapped with impervious nonwoven material or contained in a ridged container system. Both packaging methods can present lifting and carrying problems. Wrapped instrument sets that are too heavy may pose an additional problem because they have no handles and are awkward to carry. Rigid container systems often have handles that make carrying easier, but the weight of the container itself adds to the total weight of a full tray. In an effort to keep costs down and conserve storage, space instrument trays may be inappropriately prepared and too heavy to lift or carry safely. Instrument sets that are flash sterilized require staff members to aseptically remove the hot trays from the sterilizer. The weight of these trays and the height of the person removing them from the sterilizer in relation to the height of the sterilizer chamber contribute to the degree of risk to that individual.

The consequences of musculoskeletal disorders are severe. Employees who experience pain and fatigue are less productive and attentive, more prone to make mistakes, more susceptible to further injury, and may be more likely to affect the health and safety of others. Nurses suffering from disabling back injuries or the fear of getting injured have contributed to the number of nurses leaving the profession, thus increasing the nursing shortage. Workplaces with high incidences of musculoskeletal disorders report increases in lost or modified workdays, higher staff member turnover, increased costs, and adverse patient outcomes.^{14,29,30}

Description of the Process

The 2005–2006 Workplace Safety Task Force was charged by AORN President Sharon McNamara, RN, MS, CNOR, to prepare a guidance document for ergonomically healthy workplaces. In addition, the task force was charged with forming a collaborative arrangement with the National Institute for Occupational Safety and Health (NIOSH) and the American Nurses Association (ANA) to work together to discuss, design, and advance the agenda of healthy work sites for perioperative professionals, to include ergonomic safety. This document was developed by AORN with the assistance of a panel of experts from the Patient Safety Center of Inquiry, Tampa, Fla; the James A. Haley Veterans Administration Medical Center (VMAC); the NIOSH Division of Applied Research and Technology Human Factors and Ergonomics Research Team; and ANA.

Members of the task force examined current research, literature, and patient care practices to evaluate and make recommendations to promote patient and caregiver safety when performing activities in a perioperative setting. While there are several high-

risk tasks specific to perioperative nurses, the task force identified seven key activities as the starting point for developing recommendations. Some of these recommendations are based upon current technology that can be immediately implemented. Others, such as use of ceiling lifts in operating rooms, are in development or are projected patient handling innovations. This group will continue to examine what is available and encourage manufacturers to develop new and innovative technologies to achieve the optimal safety of the patient and the caregiver. Development of this equipment is critical for successful implementation of these ergonomic tools.

The ergonomic tools developed for this guidance document are based on previous work by Audrey Nelson, PhD, RN, FAAN; experts within the Veterans Administration (VA); and nationally recognized researchers.²⁸ The ergonomic tools for safe patient handling and movement have been designed with the goal of eradicating job-related musculoskeletal disorders in perioperative nurses. The ergonomic tools and algorithms were developed based on professional consensus and evidence from research. Plans are under way for pilot tests in several facilities.

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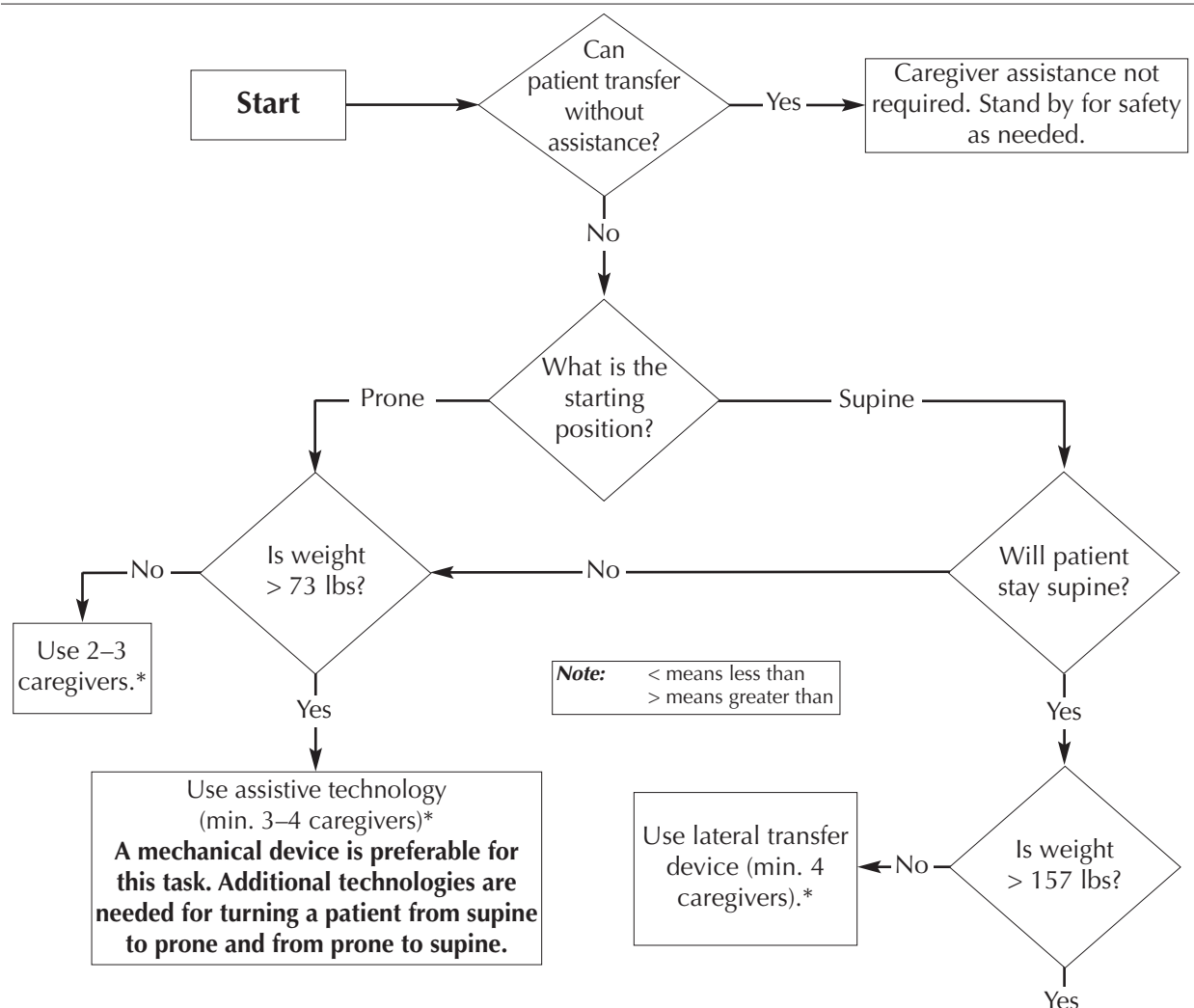
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Ergonomic Tool #1

LATERAL TRANSFER FROM STRETCHER TO AND FROM THE OR BED



- The number of personnel to safely transfer the patient should be adequate to maintain the patient's body alignment, support extremities, and maintain patient's airway.
- For lateral transfers, it is important to use a lateral transfer device that extends the length of the patient.
- Current technologies for supine-to-prone include the Jackson frame and the spine table.
- Destination surface should be slightly lower for all lateral patient moves.
- A separate algorithm for prone-to-jackknife is not included because this is assumed to be a function of the table.
- If the patient's condition will not tolerate a lateral transfer, consider the use of a mechanical lift with a supine sling.
- During any patient transfer task, if any caregiver is required to lift more than 35 lbs of a patient's weight, assistive devices should be used for the transfer.
- While some facilities may attempt to perform a lateral transfer simultaneously with positioning the patient in a lateral position (ie, side-lying), this is not recommended until new technology is available.
- The assumption is that the patient will leave the operating room in the supine position.

Use one of the following: mechanical lift with supine sling, mechanical lateral transfer device, or air-assisted lateral transfer device (min. 3-4 caregivers).*

* One of the caregivers may be the anesthesia provider.



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