

POSITIONING THE PATIENT: SAFE PRACTICES



1992

1992

POSITIONING THE PATIENT: SAFE PRACTICES

STUDY GUIDE

Disclaimer

AORN and its logo are registered trademarks of AORN, Inc. AORN does not endorse any commercial company's products or services. Although all commercial products in this course are expected to conform to professional medical/nursing standards, inclusion in this course does not constitute a guarantee or endorsement by AORN of the quality or value of such products or of the claims made by the manufacturers.

No responsibility is assumed by AORN, Inc, for any injury and/or damage to persons or property as a matter of product liability, negligence or otherwise, or from any use or operation of any standards, guidelines, recommended practices, methods, products, instructions, or ideas contained in the material herein. Because of rapid advances in the health care sciences in particular, independent verification of diagnoses, medication dosages, and individualized care and treatment should be made. The material contained herein is not intended to be a substitute for the exercise of professional medical or nursing judgment.

The content in this publication is provided on an "as is" basis. TO THE FULLEST EXTENT PERMITTED BY LAW, AORN, INC, DISCLAIMS ALL WARRANTIES, EITHER EXPRESS OR IMPLIED, STATUTORY OR OTHERWISE, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY, NON-INFRINGEMENT OF THIRD PARTIES' RIGHTS, AND FITNESS FOR A PARTICULAR PURPOSE.

This publication may be photocopied for noncommercial purposes of scientific use or educational advancement. The following credit line must appear on the front page of the photocopied document:

Reprinted with permission from The Association of periOperative Registered Nurses, Inc.

Copyright 2018 "Positioning the Patient: Safe Practices."

All rights reserved by AORN, Inc.
2170 South Parker Road, Suite 400
Denver, CO 80231-5711
(800) 755-2676 www.aorn.org

Video produced by Cine-Med, Inc.
127 Main Street North
Woodbury, CT 06798
Tel (203) 263-0006 Fax (203) 263-4839
www.cine-med.com

Positioning the Patient: Safe Practices

TABLE OF CONTENTS

LEARNING OUTCOME.....	4
OBJECTIVES.....	4
INTRODUCTION.....	5
DIGNITY AND PRIVACY.....	5
PREOPERATIVE ASSESSMENT.....	5
Procedural Factors.....	5
Assessment Of Risk For Pressure Injuries.....	5
Patient-Specific Factors.....	6
POSITIONING EQUIPMENT AND DEVICES.....	7
GENERAL SAFE POSITIONING PRACTICES.....	7
SUPINE POSITION.....	8
TRENDELENBURG POSITION.....	10
REVERSE TRENDELENBURG POSITION.....	10
LITHOTOMY POSITION.....	10
SITTING AND SEMI-SITTING POSITION.....	12
LATERAL POSITION.....	12
PRONE POSITION.....	14
PATIENTS WHO ARE PREGNANT.....	15
PATIENTS WHO ARE OBESE.....	15
HAND OVER TO THE PERIANESTHESIA RN.....	15
DOCUMENTATION.....	16
EDUCATION AND COMPETENCY VERIFICATION.....	16
SUMMARY.....	16
REFERENCES.....	17
POST-TEST.....	18
POST-TEST ANSWERS.....	20

LEARNING OUTCOME

After completing this study guide and viewing the accompanying video, the perioperative registered nurse (RN) and other perioperative team members will have increased their knowledge of risk factors for positioning-related patient injuries, potential complications of surgical positions, and safe positioning practices in the perioperative setting.

OBJECTIVES

The participant will be able to

- conduct a preoperative nursing assessment to identify risk factors for positioning-related injuries;
- identify, select, and use positioning equipment and devices;
- implement safe practices for positioning a patient, including patients who are pregnant or obese; and
- modify safe positioning practices for specific surgical positions.

INTRODUCTION

Positioning patients is one of the most important tasks performed by perioperative team members, and responsibility is shared by the entire team. Goals of patient positioning include providing exposure for the surgical site; maintaining the patient's comfort and privacy; providing access to intravenous (IV) lines and monitoring equipment; allowing for optimal ventilation; maintaining circulation; stabilizing the patient to prevent unintended shifting; and protecting the muscles, nerves, bony prominences, joints, skin, vital organs, fingers, toes, and genitals from injury.¹

Incorrect patient positioning can result in serious injury. Most injuries are caused by compression or stretching. Injuries can affect the skin, soft tissue, joints, ligaments, bones, eyes, and nerves. Some injuries are only temporary, however some can cause permanent disability.¹

Elements of the perioperative environment place patients at risk for positioning-related injuries. Patients are generally required to remain immobile for their procedures and are placed on relatively hard surfaces, sometimes for prolonged periods. Anesthesia blunts the patient's ability to feel pain, numbness, tingling, or changes in temperature. Patients who receive sedation or general anesthesia cannot effectively communicate with perioperative team members. For these reasons, the perioperative team must be proactive in preventing positioning-related injuries.¹

Positioning-related injuries may be deemed negligence or failure to meet the duty of care. The doctrine of *res ipsa loquitur*, or "the thing speaks for itself," may apply. Under this doctrine, it is assumed that the cause of the injury was under the control of the defendant (eg, health care provider).¹

Positioning-related injuries are a very serious matter. To minimize the risk of these injuries, it is essential for the perioperative team to implement safe positioning practices.¹

DIGNITY AND PRIVACY



Perioperative team members should provide care that respects the dignity and privacy of each patient during positioning.

Maintaining privacy helps to establish trust between patients and caregivers. Measures that can help maintain privacy include keeping windows covered and doors closed in patient care areas, restricting access to only authorized personnel in perioperative care areas, limiting traffic in procedure rooms, and exposing only as much of the patient's body as necessary to provide care or access. Keeping the patient covered unless specific exposure is required provides the added benefit of helping to keep the patient warm.¹

PREOPERATIVE ASSESSMENT

The perioperative RN should conduct a preoperative assessment to identify patients at risk for injuries related to positioning. When such patients are identified, a plan of care should be developed and implemented to prevent injury.¹

Procedural Factors

Procedural factors to consider include:

- Type of procedure (abdominal, noncardiac thoracic, and orthopedic procedures have the highest risk for pressure injuries)
- Estimated length of the procedure
- Desired position for the procedure
- Ability of the patient to tolerate the anticipated position
- Amount of required surgical exposure
- Ability of the anesthesia professional to access the patient
- Potential changes of position
- Positioning devices required¹

External pressure on bony prominences for prolonged periods is a key factor in the development of pressure injuries. Specific pressure points vary with different surgical positions and with placement of different positioning devices. Straps or adhesive tape used to secure patients in desired positions can also be a source of pressure that can cause injury.¹

Assessment of Risk for Pressure Injuries

The perioperative RN should assess the patient's risk for pressure injuries. Prevention of these injuries is an important part of perioperative care. The Centers for Medicare & Medicaid Services do not pay for health care services related to treatment of Stage 3 or Stage 4 pressure ulcers that develop during a hospital admission.^{1,2}

Consistent use of the same processes and tools for assessment of risk and prevention of pressure injuries throughout a health care organization promotes consistent reporting and



communication among caregivers working in different areas. For this reason, perioperative RNs should participate in the health care organization's pressure injury prevention program.¹

The perioperative RN should use a structured risk assessment tool to assess the risk for pressure injury. Structured tools provide a practical framework for assessment, definitions of risk factors with clinical relevance, clinical reminders of risk, and an auditable standard. Risk assessment tools do not necessarily include all relevant factors and have limited ability to determine relative importance of different factors or the cumulative effect of multiple factors. For these reasons, the tool does not replace the need for a comprehensive patient assessment by a qualified perioperative RN using sound clinical judgement.¹

Patient-Specific Factors

The perioperative RN should assess patient-specific factors that can increase the risk for positioning-related injury.¹

The risk assessment should include the patient's age. Patients at either extreme of age (ie, older or very young) are at increased risk for pressure injury. Patients over the age of 65 are particularly vulnerable. Older adults may also have comorbidities that increase their risk for injury (eg, osteoporosis, osteoarthritis, coronary artery disease).¹

Poor nutritional status can increase the risk for injury. Malnourished patients lack the reserves needed to promote effective healing and to protect the body from injury. Patients who are obese and patients who have undergone weight loss surgery might also be at risk for nutritional deficits.¹

Perioperative RNs should also assess the patient's

- American Society of Anesthesiologists physical status classification,
- body mass index,
- comorbidities affecting tissue perfusion (eg, diabetes,

peripheral vascular disease),

- peripheral pulses, and
- skin condition (eg, color, turgor, integrity, temperature, moisture, pre-existing pressure injury).¹

The assessment findings may identify risk factors that place the patient at risk for pressure injury.



A patient's medical device can cause injuries by putting pressure on the skin. Devices that can potentially have a significant clinical impact on the patient if they are dislodged or fail to perform as expected are considered critical devices. Examples include vascular access devices, endotracheal tubes, nasogastric feeding tubes, indwelling urinary catheters, and drains. Patients can also have tubes or other attachments that may become trapped in skin folds and cause damage, especially for patients who are obese. Children are particularly vulnerable to pressure-related injury from these devices. Critical devices should be secured and supported in a manner that decreases pressure and does not damage skin. Prophylactic dressings may be used to prevent pressure injuries related to these devices.¹

Jewelry or body piercings can lead to surgical site infections, electrical burns, airway obstruction, or pressure injuries. Dermal implants can increase the risk for pressure injuries, which may initially affect deeper tissues and might not be immediately apparent. Critical implanted devices (eg, pacemakers, implanted ports for chemotherapy) can present similar issues. Iris implants or eye jewelry can cause injury to the eyes if the patient is positioned prone. Some jewelry or piercings can become tangled in bedding or caught in equipment, and this can cause injuries if the jewelry is accidentally pulled out. The perioperative RN should ensure that jewelry, piercings, and other items that can pose a risk for injury are removed whenever possible. The perioperative team should not position a patient lying on an implanted device. If this is unavoidable, the perioperative team should reposition the patient periodically during the procedure, if possible.¹

Braided hair or hair accessories can create sufficient pressure to cause injury if the patient lies on them. Hair extensions might be attached with metal clips, tapes, or adhesives that can lead to pressure injuries. The perioperative RN should verify that hair accessories have been removed.¹

Prosthetics (eg, a prosthetic limb) or corrective devices (eg, an orthopedic immobilizer) can put pressure on the skin and soft tissue if left in place during the procedure.¹

The perioperative RN should communicate with perioperative team members regarding the patient's risk for injuries related to positioning. Team members should collaborate to determine interventions for mitigating this risk.¹

POSITIONING EQUIPMENT AND DEVICES



The perioperative team should identify and provide the positioning equipment and devices needed for the procedure. Factors to consider include optimal exposure for the surgical team, placement of equipment and devices, modifications necessary to accommodate the patient's physical needs, and access for the anesthesia professional. Perioperative personnel should confirm availability of the required equipment when the procedure is scheduled. Positioning devices should have the size and weight capacity needed for safe movement of the patient. When positioning the patient, the perioperative team should place the devices under the patient and not beneath the mattress or overlay.¹

The perioperative RN should confirm that the OR is set up properly for the planned procedure before the patient is brought into the room. During the time out, the team should confirm again that the patient is in the correct position for the procedure and the correct equipment is being used or is available for use.¹

Perioperative team members should clean, inspect, and maintain positioning equipment and ensure it is repaired or replaced when damaged, defective, or obsolete. Maintaining clean and functional devices contributes to safety for both

patients and perioperative personnel. Team members should always follow the manufacturer's instructions when using OR beds and attachments.¹

GENERAL SAFE POSITIONING PRACTICES

Perioperative team members should implement safe positioning practices.¹ Each surgical position requires specific safety practices, and some safety practices are common to all or most positions.



The perioperative team should ensure the patient's head and neck are maintained in a neutral position without extreme lateral rotation. Lateral rotation can cause stretching injuries to nerves or compress muscles and vessels. Direct compression on the neck muscles can lead to compartment syndrome. Extreme neck rotation can precipitate paraplegia in patients with preexisting spinal cord pathology. Hyperextension of the neck can cause stretch injuries to nerves, compress the carotid sinus, or injure the spinal cord. Team members should ensure the patient's neck is not hyperextended for prolonged periods.¹

Prolonged pressure on the scalp can cause alopecia. If possible, team members should reposition the patient's head from time to time during the procedure to reduce scalp pressure. Team members may also massage the patient's scalp.¹

Team members should protect the patient's eyes. Patients under general anesthesia are at risk for corneal abrasions or other injuries. Tear production decreases and the eyes may not fully close. Measures for protecting the patient's eyes can include lubrication, use of transparent dressings, and/or taping. Taping the eyes horizontally is more effective than taping vertically. Simply closing the eyes does not provide enough protection.¹

After the patient is positioned, the perioperative RN should ensure the patient's body is in physiologic alignment and that no part of the patient's body is in contact with hard surfaces



or metal portions of the OR bed. Contact with hard surfaces can cause nerve injuries. Team members should ensure that the patient's extremities do not unintentionally drop or hang below the level of the OR bed.¹

The perioperative RN should monitor the location of the patient's hands, fingers, feet, toes, and genitals during positioning activities, including changes in the configuration of the OR bed, to ensure that all extremities are clear of OR bed breaks, sources of compression, or other potential hazards. The team members should apply safety restraints and monitoring devices (eg, blood pressure cuff, pulse oximetry monitor) in a manner that safely secures the patient and allows the device to function without excessive compression. After positioning or repositioning the patient, the perioperative RN should verify the placement, tightness, and security of safety restraints and ensure no devices or equipment are resting against the patient.¹

Perioperative team members should position patients on surfaces that reduce the potential for pressure-related injuries. Surfaces should be smooth, free of wrinkles, and designed to redistribute pressure. Patients should not be positioned on multiple layers of sheets, blankets, or other materials. Placing blankets and other materials between the patient and support surfaces reduces the ability of the support surface to redistribute pressure. The team should not position the patient on top of a warming blanket. Prophylactic dressings may be applied to bony prominences (eg, heels, sacrum) or other areas subjected to pressure, friction, and shear.¹

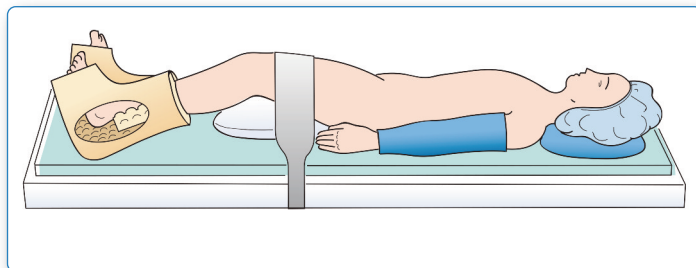
The perioperative team should not use towels, sheets, or blankets as positioning devices because they can increase pressure, contribute to friction-related injuries, and decrease the ability of the support surface to redistribute pressure. Pillows may be used for positioning, however they provide only minimal pressure redistribution. Vacuum-packed positioning devices may also be used.¹

Neurophysiological monitoring is used during some surgical procedures to detect changes in the electrophysiological

conduction of peripheral nerves and central nervous system pathways that may signal damage to the nervous system. Implementing repositioning interventions to reverse neurological conduction changes identified by neurophysiological monitoring may prevent peripheral nerve injury.¹

Scrubbed team members should not lean against the patient.¹

SUPINE POSITION



Perioperative team members should implement safe practices when positioning the patient in the supine position. The supine position is the most frequently used position for surgical procedures because it provides good access to many areas of the body. This position puts extra pressure on the back of the head, shoulders, elbows, buttocks, and heels. Care should be taken to minimize the risk of pressure injury in these areas.¹

The patient's arms should be secured. Options for securing the patient's arms include:

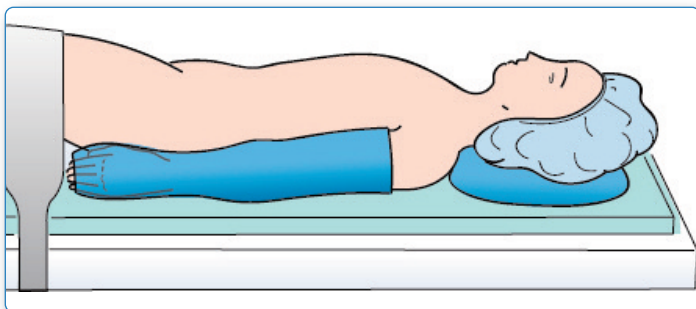
- Tucked at the sides and secured with a draw sheet
- Secured at the sides with arm guards
- Flexed and secured across the body
- Extended on arm boards¹

The position of the arms is determined by the needs of the surgical team and the physical limitations of the patient.¹

If the patient's arms are tucked at the sides and secured with a draw sheet, the perioperative team should ensure the arms are in a neutral position with the palms facing the body. The elbows should not be hyperextended, and the elbows and hands may be protected with extra padding. The draw sheet should extend from the mid-upper arm to the fingertips.¹

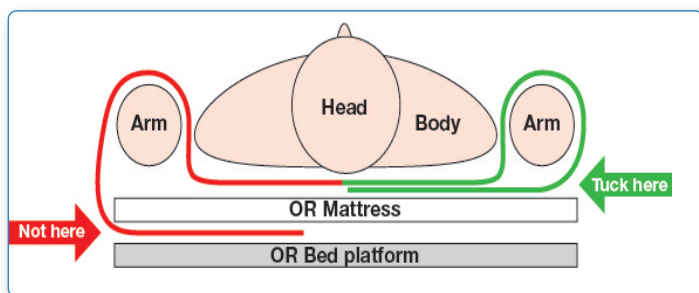
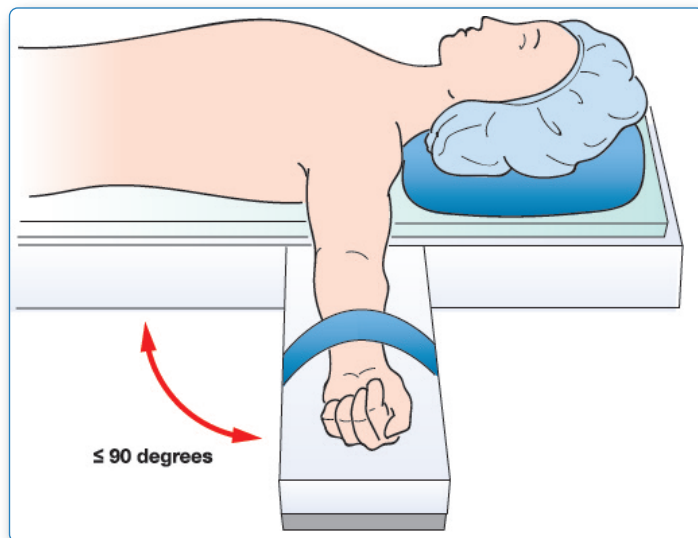
Supine Position with Arm Tucked at the Side and Secured With a Draw Sheet.

When tucking the draw sheet, team members should pull it up between the patient's body and arm, wrap it over the patient's arm, and tuck it between the patient and the OR bed mattress. The sheet should not be tucked between the mattress and the OR bed platform. If it is tucked between the mattress and the bed platform, the patient's arm might fall outside the mattress



Reprinted with permission. Copyright (c) 2018, AORN, Inc, 2170 S. Parker Road, Suite 400, Denver, CO 80231. All rights reserved.

and come to rest against the metal portion of the OR bed. The draw sheet should be tucked snugly enough to secure the patient's arm, but not so tightly that it becomes a pressure source.¹



Supine Position. Tucking the Arms With a Draw Sheet.

Reprinted with permission from Guidelines for Perioperative Practice. Copyright (c) 2018, AORN, Inc, 2170 S. Parker Road, Suite 400, Denver, CO 80231. All rights reserved.

If the patient's arms are extended on arm boards, the palms should face up to decrease pressure on the ulnar nerve. The arm boards should be padded and level with the OR bed mattress. Arm boards lower than the OR bed increase the risk for a stretch injury to the brachial plexus. To further reduce the risk for a stretch injury, the arms should be abducted less than 90 degrees and should not be positioned above the head. The arms and wrists should be maintained in neutral alignment without hyperextension, and the arms should be secured to the arm boards.¹

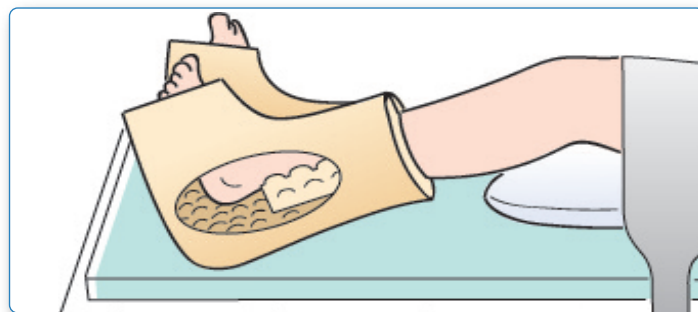
Supine Position with Arm Extended less than 90 degrees, Secured on an Arm Board, and Palm Facing Up.

Reprinted with permission. Copyright (c) 2018, AORN, Inc, 2170 S. Parker Road, Suite 400, Denver, CO 80231. All rights reserved.

The team should flex the patient's knees approximately 5 to 10 degrees to prevent popliteal vein compression and reduce the patient's risk for deep venous thrombosis. The perioperative RN can place pillows or pads under the patient's lumbosacral area and/or knees.¹

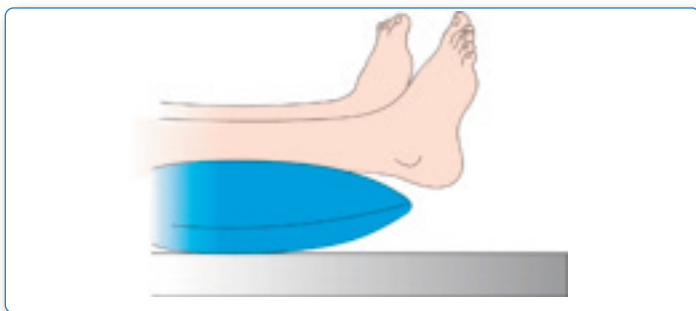
Team members should place the safety strap approximately 2 inches above the patient's knees. Placing the strap on the patient's upper thighs or below the patient's knees does not effectively restrain the patient. Placing it directly over the knees increases the risk for nerve injury. The team should ensure the patient's legs are parallel with the ankles uncrossed.¹

The perioperative RN should take measures to minimize the risk of pressure injury to the heels. The heels should be elevated off the underlying surface to increase perfusion and to help prevent pressure injury. Pressure should be redistributed using either a heel-suspension device or a wide pressure-redistributing surface. A heel-suspension device distributes the weight of the patient's leg along the calf without placing pressure on the Achilles tendon. A wide support surface helps prevent localized pressure on the lateral malleolus if the leg rotates externally. Team members should protect the patient's feet from hyperflexion or hyperextension, which can occur from the weight of blankets or equipment.¹



Supine Position. Redistributing Pressure on the Heels.

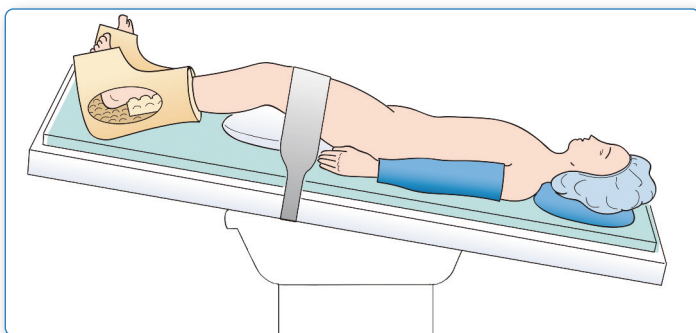
Reprinted with permission. Copyright (c) 2018, AORN, Inc, 2170 S. Parker Road, Suite 400, Denver, CO 80231. All rights reserved.



Supine Position: Elevate Heels to Redistribute Pressure.

Reprinted with permission. Copyright (c) 2018, AORN, Inc, 2170 S. Parker Road, Suite 400, Denver, CO 80231. All rights reserved.

TRENDELENBURG POSITION



Perioperative team members should implement safe practices when positioning the patient in the Trendelenburg position. In the Trendelenburg position, the patient's feet are higher than the head by 15 to 30 degrees. This position shifts the abdominal viscera toward the head to improve surgical access to the pelvic organs. Trendelenburg position causes redistribution of the blood supply from the lower extremities into the central and pulmonary circulation. Venous return from the head decreases, leading to venous pooling, increased intraocular pressure, and swelling of the eyes, lips, tongue, and larynx.¹

The degree of Trendelenburg should be minimized as much as possible, and the position should be maintained for the shortest possible time.¹ This will most likely be determined by the surgeon and, to a lesser extent, the anesthesia professional.

Perioperative team members should implement measures to prevent the patient from sliding on the OR bed. Options include

- convoluted foam or viscoelastic gel overlays,
- vacuum-packed positioning devices, and
- other devices specifically designed for this purpose.¹

The perioperative RN should tuck the patient's arms at the sides with a draw sheet or secure them with arm guards. The arms should not be placed on arm boards. Extending the patient's arms on arm boards can lead to excessive abduction and nerve injuries if the patients slides toward the head of the bed. Circumferential wrist restraints can injure the brachial plexus and should not be used.¹

Shoulder braces can injure the brachial plexus and should be avoided whenever possible. If braces must be used, the team should pad the shoulder braces and ensure the point of contact is at the level of the acromioclavicular joints.¹

After the patient is in Trendelenburg, the anesthesia professional should check the patient's airway.¹

Reverse Trendelenburg Position

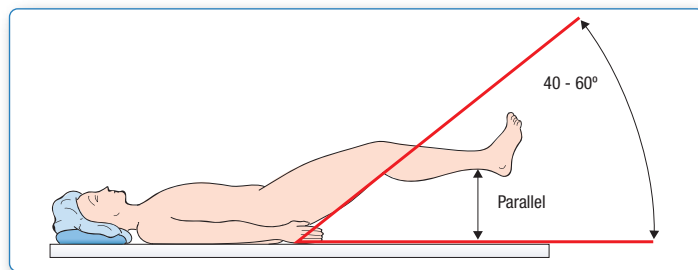
In the reverse Trendelenburg position, the patient's head is positioned 15 to 30 degrees higher than the feet. Venous pooling in the lower extremities can occur with this position.¹

The perioperative RN should use a padded foot board to help prevent the patient from sliding downward on the OR bed and to reduce the potential for injury to the peroneal and tibial nerves related to foot and ankle flexion. The RN should also assess and monitor the patient's feet during the procedure.¹

LITHOTOMY POSITION

Perioperative team members should implement safe practices when positioning the patient in the lithotomy position. The lithotomy position provides surgical exposure for vaginal, rectal, and urological procedures. There are several modifications of this position.¹

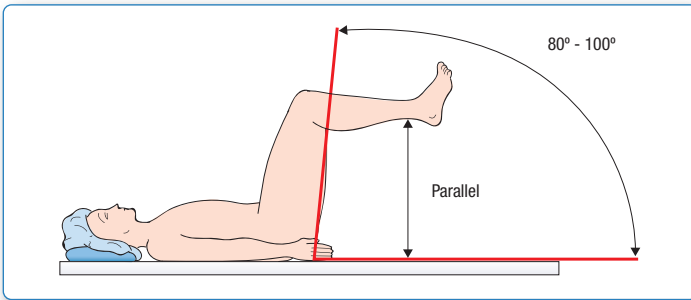
In the low lithotomy position, the patient's hips are flexed until the angle between the posterior surface of the thighs and the OR bed surface is 40 to 60 degrees. The patient's lower legs are parallel with the OR bed.¹



Low Lithotomy Position.

Reprinted with permission. Copyright (c) 2018, AORN, Inc, 2170 S. Parker Road, Suite 400, Denver, CO 80231. All rights reserved.

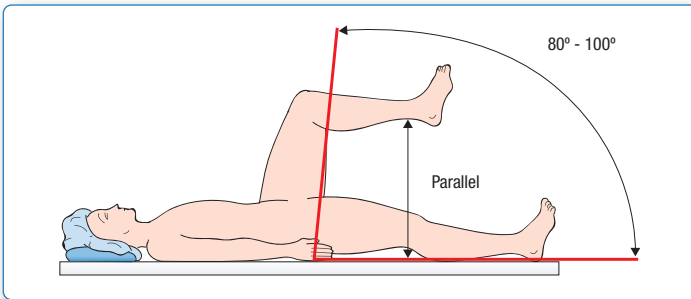
In standard lithotomy position, the hips are flexed to an angle of 80 to 100 degrees. The patient's lower legs are parallel with the OR bed.¹



Standard Lithotomy Position.

Reprinted with permission. Copyright (c) 2018, AORN, Inc, 2170 S. Parker Road, Suite 400, Denver, CO 80231. All rights reserved.

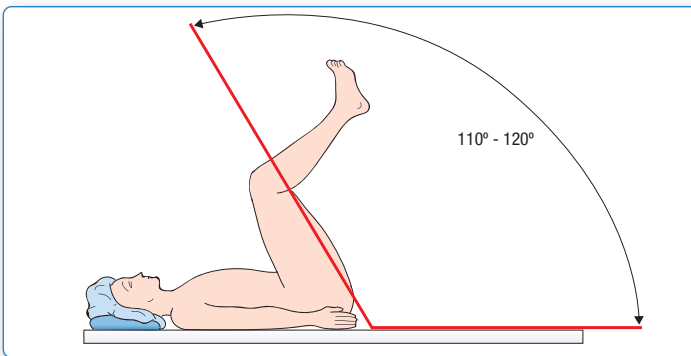
In the hemi-lithotomy position, the patient's nonoperative leg is positioned in standard lithotomy. The patient's operative leg may be placed in traction.¹



Hemi-Lithotomy Position.

Reprinted with permission. Copyright (c) 2018, AORN, Inc, 2170 S. Parker Road, Suite 400, Denver, CO 80231. All rights reserved.

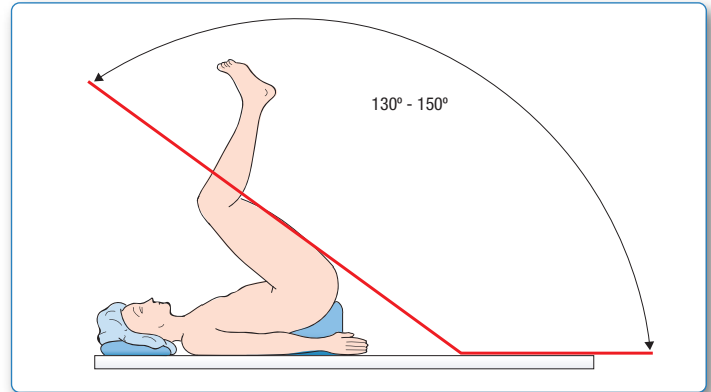
In the high lithotomy position, the hips are flexed to an angle of 110 to 120 degrees. The patient's lower legs are flexed.¹



High Lithotomy Position.

Reprinted with permission. Copyright (c) 2018, AORN, Inc, 2170 S. Parker Road, Suite 400, Denver, CO 80231. All rights reserved.

In the exaggerated position, the hips are flexed to an angle of 130 to 150 degrees. The lower legs are almost vertical.¹



Exaggerated Lithotomy Position.

Reprinted with permission. Copyright (c) 2018, AORN, Inc, 2170 S. Parker Road, Suite 400, Denver, CO 80231. All rights reserved.

The lithotomy position shifts blood from the legs to the central circulation and decreases leg perfusion. Venous return and cardiac output are increased. The patient's abdominal organs shift when the legs are placed in leg holders, and this can increase pressure on the diaphragm and lead to respiratory problems. The patient should be kept in this position for the shortest time possible.¹

The perioperative RN should ensure the leg holders are at an even height. Injury can occur if one leg holder is higher than the other. Team members should slowly and simultaneously place the patient's legs into the leg holders. At least one person should be assigned to each leg. In some cases, two people per leg may be required. The patient's legs should be supported over the largest possible surface area. Boot-type leg holders support the entire leg and distribute pressure evenly, reducing the potential for nerve and pressure injury. When using candy cane-shaped leg holders, the perioperative RN should place additional padding around the patient's foot and ankle. Team members should not allow the patient's legs to rest against the leg holder posts.¹

The perioperative RN should place the patient's heels in the lowest position possible. The buttocks should be even with the lower break of the procedure bed and positioned to securely support the sacrum on the bed surface. The hips should be positioned to prevent excessive flexion, rotation, or abduction. Excessive flexion (> 80 to 90 degrees) or abduction (> 30 to 45 degrees) can cause neuropathies. Hips are particularly vulnerable to excessive rotation and hyperabduction when candy cane-shaped leg holders are used.¹

The perioperative RN should not place the safety restraint over the patient's chest or abdomen. Placement of the restraint can be challenging in the lithotomy position. The location of the surgical site might prevent placement of the restraint low across the pelvis. A tight restraint placed across the abdomen can increase the risk for pressure injury or restrict respiration. Trendelenburg position is frequently used in conjunction with lithotomy, and the patient might shift on the OR bed when Trendelenburg is applied. At least one team member should attend the patient at all times while the patient is on the OR bed.¹

The perioperative RN should protect the patient's hands and fingers from injury when the foot of the OR bed is raised, lowered, or reattached. If the arms are tucked, the hands and fingers are in particular danger when the foot of the bed is manipulated.¹



Scrubbed personnel should not lean against the patient's thighs.¹

When it is time to take the patient out of the lithotomy position, perioperative team members should remove the patient's legs from the leg holders in a two-step process, with at least one person assigned to each leg.

Step 1: Remove the legs slowly and simultaneously from the leg holders and bring them together.

Step 2: Simultaneously lower the legs to the OR bed.¹

An acceptable alternative practice that the team can implement is to slowly and simultaneously remove the legs from the leg holders, bring them together, and then lower one leg at a time to the OR bed.¹

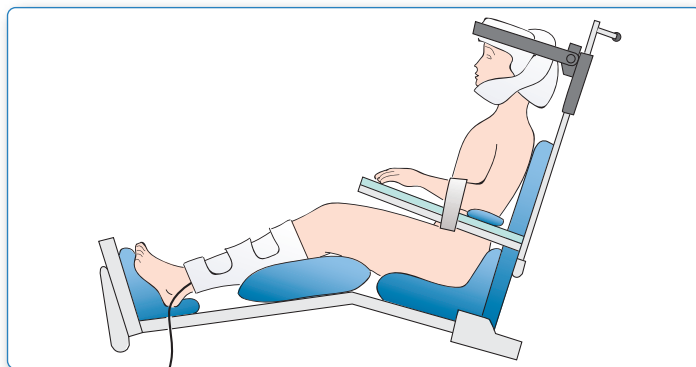
SITTING AND SEMI-SITTING POSITION

Perioperative team members should implement safe practices when positioning the patient in the sitting or semi-sitting position. The sitting position (also known as the Fowler position) and the semi-sitting position (also known as the beach chair position) are used for access to the shoulder, posterior cervical spine, and posterior or lateral head. The head, neck, and torso are elevated 20 to 90 degrees, the hips

are flexed 45 to 60 degrees, and the knees are flexed 30 degrees. These positions may be accompanied by 10 to 15 degrees of Trendelenburg. Complications that may arise from the sitting or semi-sitting positions include venous air embolism, hemodynamic instability, pneumocephalus, quadriplegia, compressive peripheral neuropathy, cerebrovascular accident (particularly if the patient is hypotensive), and venous pooling in the patient's pelvis.¹

In these positions, the amount of head elevation should be minimized as much as possible, and the head should be kept in a neutral position without excessive flexion, extension, or rotation. Team members should assess the position of the patient's head after any positioning activities and monitor the head's position during the procedure. Horseshoe-shaped head positioners may cause neuropathies and should be avoided, if possible.¹

The perioperative RN should pad the patient's buttocks to help prevent excessive pressure on the sciatic nerve and coccyx. The patient's knees should be flexed 30 degrees to reduce stretching of the sciatic nerve. The RN should check the placement and security of the safety restraint across the patient's thighs because it may tighten as the patient is moved into position. Sequential compression devices may be used to limit venous pooling and improve venous return from the legs.¹



Sitting Position.

Reprinted with permission. Copyright (c) 2018, AORN, Inc, 2170 S. Parker Road, Suite 400, Denver, CO 80231. All rights reserved.

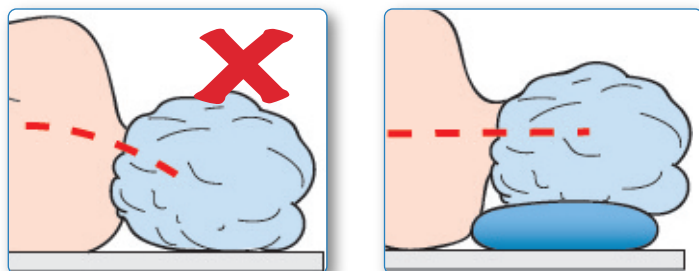
If the patient is obese and has a pannus, team members should prevent the pannus from resting on the thighs, if possible.¹

LATERAL POSITION

Perioperative team members should implement safe practices when positioning the patient in the lateral position. In the lateral position, the patient is positioned with the nonoperative side down. The dependent side is the reference point for documentation. For example, in a right lateral position, the

patient is lying on his or her right side and this provides exposure for a left-sided procedure. The lateral position is used for orthopedic procedures involving the hip and, with some modification, for kidney and thoracic procedures. Patients in the lateral position are at risk for pressure injuries to vulnerable points on the dependent side such as the ear, iliac crest, greater trochanter, lateral knee, and malleolus. Prolonged surgery in the lateral position can also lead to compartment syndrome or rhabdomyolysis. For these reasons, patients should be kept in the lateral position for the shortest time possible.¹

When positioning a patient lateral, the perioperative RN should place a head positioner or pillow under the patient's head to maintain cervical alignment. The dependent ear should be assessed and monitored after positioning and during the procedure. Horseshoe-shaped head positioners can cause facial edema and should be avoided, if possible.¹



Lateral Position: Place Head Positioner Under the Patient's Head to Maintain Cervical Alignment.

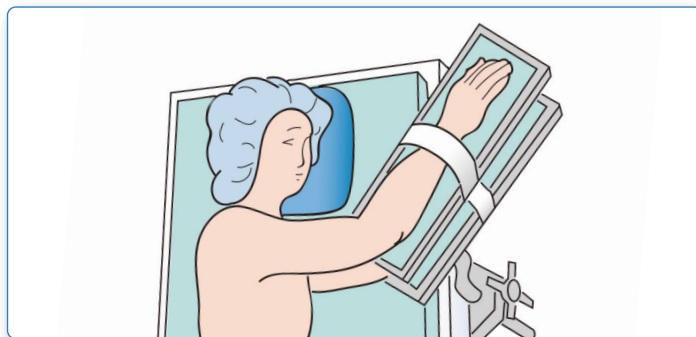
Image on the right is depicting a recommended practice. Note the image on the left is depicting a practice that is not correct.

Reprinted with permission. Copyright (c) 2018, AORN, Inc, 2170 S. Parker Road, Suite 400, Denver, CO 80231. All rights reserved.

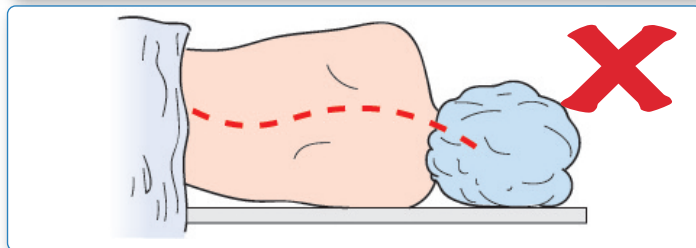
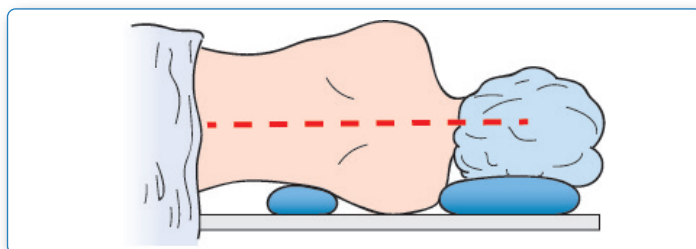
The patient's arms may be supported and secured on two level and parallel arm boards. Team members should position one arm on each board, and both arms should be abducted less than 90 degrees. The lower arm should be positioned on the same plane as the OR bed mattress, with the forearm and wrist in a neutral position and the palm up. The upper arm should be positioned on the same plane as the shoulder, with the forearm and wrist in a neutral position and the palm down. If a procedure is planned on the upper arm, the arm may be held by the surgeon or surgical assistant or suspended by a specifically designed positioning device. If the patient's arm is suspended, it should not be abducted more than 90 degrees.¹

Lateral Position: Two Level and Parallel Arm Boards

Reprinted with permission. Copyright (c) 2018, AORN, Inc, 2170 S. Parker Road, Suite 400, Denver, CO 80231. All rights reserved.



The perioperative RN should place an axillary roll under the patient's dependent thorax, distal to the axillary fold, at the level of the seventh to ninth rib. The term axillary roll is commonly used but misleading. This positioning support should not be placed in the axilla. Placing it there could injure the long thoracic nerve, cause vascular obstruction, or compromise IV infusions and intra-arterial monitors in the dependent arm. The word roll may imply that the positioning support is composed of a rolled sheet or towel, but rolled sheets and towels do not redistribute pressure and should not be used. Bags of IV fluids are also unsuitable and should not be used. The perioperative team should use a specifically designed axillary support. It should be wide enough to spread its lifting ability over several ribs. Spinal alignment should be maintained.¹



Lateral Position.

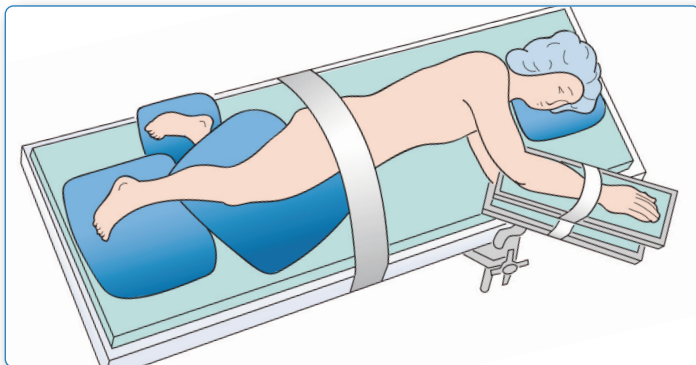
Top Image: Axillary Support Positioned Under the Patient's Dependent Thorax, Distal to the Axillary Fold, and at the Level of the 7th to 9th Rib.

Note: lower image is depicting a practice that is not correct.

Reprinted with permission. Copyright (c) 2018, AORN, Inc, 2170 S. Parker Road, Suite 400, Denver, CO 80231. All rights reserved.

The RN should place a safety restraint across the patient's

hips. The dependent leg should be flexed at the hip and knee. The upper leg should be straight and supported with pillows between the legs. The dependent knee, ankle, and foot should be padded. The patient's breasts and abdomen should not be compressed or hang over the edge of the OR bed.¹



Lateral Position.

Reprinted with permission. Copyright (c) 2018, AORN, Inc, 2170 S. Parker Road, Suite 400, Denver, CO 80231. All rights reserved.

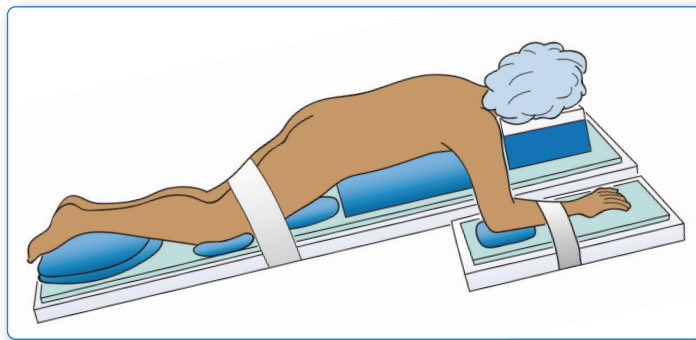
PRONE POSITION

Perioperative team members should implement safe practices when positioning the patient in the prone position. The prone position provides surgical access to the back of the patient's body. The jack-knife position is a variation of prone that provides additional exposure for sacral, rectal, or perineal areas. Potential complications associated with the prone position include increased intra-abdominal pressure, increased bleeding, abdominal compartment syndrome, limb compartment syndrome, nerve injuries, pressure injuries, cardiovascular compromise, thrombosis, stroke, hepatic dysfunction, ocular injuries, oropharyngeal swelling, dislodgement of airway maintenance devices, and venous air embolism. The patient should be in the prone position for the shortest time possible.¹

Prone patients should be positioned in 5- to 10-degree reverse Trendelenburg, if possible, to reduce venous congestion in and around the eye and to reduce facial edema.¹

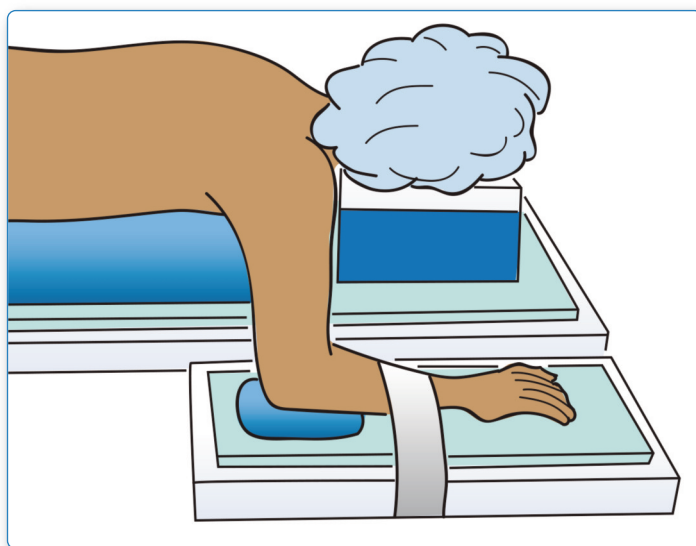
The perioperative team should position the patient's head in a neutral position, without excessive flexion, extension, or rotation. The team should use a face positioner designed for this purpose and should avoid horseshoe-shaped head positioners, if possible. The team should assess the patient's face and eyes after positioning. Direct pressure on the patient's eyes should be prevented. The anesthesia professional should assess the patient's airway.¹

Prone Position.



Reprinted with permission. Copyright (c) 2018, AORN, Inc, 2170 S. Parker Road, Suite 400, Denver, CO 80231. All rights reserved.

Prone Position: Close up of Head, Upper Chest, Arm.



Reprinted with permission. Copyright (c) 2018, AORN, Inc, 2170 S. Parker Road, Suite 400, Denver, CO 80231. All rights reserved.

The perioperative RN should tuck the patient's arms at the sides with a draw sheet, secure them at the sides with arm guards, place them on an arm board parallel to the OR bed, or place them on an arm rest with adjustment joints designed for this purpose. The needs of the surgical team and the physical limitations of the patient will determine how the arms are secured.¹

The team should position the patient on two chest supports that extend from the clavicle to the iliac crest to allow chest and abdominal expansion and to decrease intra-abdominal pressure. The team should ensure the breasts, abdomen, and genitals are free from torsion or pressure. The patient's knees should be padded, and padding should be placed under the shins to elevate the toes off the bed.¹

Emergencies can arise unexpectedly in the OR. For example, cardiopulmonary resuscitation might be needed. Whenever a patient is prone, a gurney should be readily accessible to facilitate rapid repositioning to the supine position.¹

PATIENTS WHO ARE PREGNANT

In women who are pregnant, the uterus can compress the aorta and inferior vena cava. This can impair uterine perfusion and reduce blood return to the heart. To minimize this, the perioperative team should position women who are more than 18 weeks pregnant in a left lateral tilt. The perioperative RN can accomplish this by placing a wedge-shaped positioning device under the right pelvis or right lumbar region to achieve a 12- to 15-degree tilt. Another option is to tilt the OR bed 15 to 45 degrees to the left.

PATIENTS WHO ARE OBESE

Positioning is critically important for patients who are obese. They are prone to pressure injuries (eg, pressure sores, nerve injuries)³ and their size may make surgical access challenging. Proper positioning of these patients is a major factor contributing to the success of a procedure.⁴

Obesity is associated with significant cardiovascular and pulmonary changes, and surgical positioning can exacerbate these changes. Obesity-related cardiovascular changes include increased

- metabolic demand,
- cardiac output,
- blood volume,
- venous return and preload, and
- work of the heart.¹

These conditions can lead to hypoxia and elevated carbon dioxide, which can, in turn, lead to pulmonary vasoconstriction and right-sided heart failure.¹

Factors affecting the patient's airway and breathing include excess fat that can lead to

- increased workload for supportive muscles,
- increased oxygen consumption and carbon dioxide production,
- decreased myocardial compliance,
- increased breathing effort,
- decreased efficiency of air exchange,
- decreased resting functional residual capacity of the lungs,
- increased incidence of gastroesophageal reflux and hiatal hernia, and
- increased abdominal pressure that increases risk for aspiration.¹

Patients who are obese are prone to sliding when the position of the OR bed is changed.⁵ Safety straps should be wide enough and long enough to secure the patient³ and should not be too tight. Excessively tight straps may restrict blood flow or cause nerve damage.^{1,4}

Increased adipose tissue in the abdominal area may compress the inferior vena cava. The team may need to place a wedge under the right lumbar region of a patient who is obese, similar to what they would do for a patient who is pregnant.^{1,3}

The perioperative RN may use padded arm guards to contain an obese patient's arms at the side of the body, if necessary.¹

The lithotomy position presents additional challenges for obese patients. Anatomic markers may be masked by excess tissue, making assessment of safe knee and hip flexion difficult. The legs might be excessively abducted to provide adequate space for the surgeon. In addition to being strong enough to support the leg, stirrups must be wide enough to hold the leg without creating pressure. Team members should move both legs at the same time to reduce the risk of nerve damage, and more than one team member may be required to move each leg. Team members should consider repositioning the patient if the procedure lasts longer than 4 hours.⁴



HAND OVER TO THE PERIANESTHESIA RN

The RN circulator should conduct a postoperative assessment to identify potential positioning-related injuries. Factors to consider in the assessment include

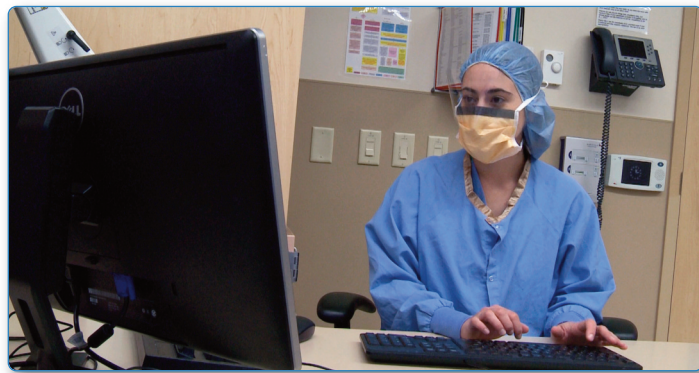
- pressure points associated with the intraoperative position;
- location of safety restraints, adhesives, monitoring devices, and positioning equipment; and
- intraoperative factors (eg, administration of blood).¹

The RN circulator should use a standardized communication tool to provide information about patient positioning to the

perianesthesia RN at the time of hand over, including the position of the patient during the procedure, areas of the patient's body that should be assessed and monitored for potential injury, and intraoperative events that may have contributed to a position-related injury.¹

The perianesthesia RN should do the following:

- Maintain the patient in a position different from the surgical position, if possible
- Monitor areas of the body at high risk for positioning-related injuries
- Assess the patient for signs and symptoms of pressure-related injury, nerve dysfunction in extremities, compartment syndrome, and ocular injury¹



DOCUMENTATION

The RN circulator should document patient care and any positioning equipment or devices used on the intraoperative record.¹

Documentation should include the following:

- Preoperative assessment
- Patient's position, including the position of the patient's arms and legs and any repositioning activities
- Types and locations of positioning equipment
- Types and locations of safety restraints
- Types and locations of additional padding
- Interventions taken to prevent patient injury
- Types and locations of critical devices, superficial implants, and items that cannot be removed
- Postoperative assessment¹

EDUCATION AND COMPETENCY VERIFICATION

Perioperative team members with responsibility for positioning patients should receive initial and ongoing

education and complete competency verification activities related to patient positioning.¹

Education and competency verification should include:

- Processes for patient assessment
- Identification of factors that increase the risk for positioning-related injuries in patients and health care personnel
- Identification and effective use of pressure-redistributing support surfaces
- Description of relevant anatomy and physiology
- Description of the characteristics of special populations served by the health care organization (eg, patients who are pregnant, patients who are obese, older adults, children)
- Procedures for safe use of positioning equipment and devices
- Implementation of safe practices for patient positioning
- Documentation of positioning activities
- Procedures for identifying and reporting positioning-related injuries to patients and health care personnel¹

SUMMARY

Patients under anesthesia are unable to protect themselves from positioning-related injuries, so it is to the responsibility of perioperative team members to take preventive measures. Preventing positioning injuries is a legal and ethical obligation for all team members. Each position carries its own unique risks. The perioperative team should only use patient positioning devices and equipment intended for patient positioning and according to the manufacturers' instruction for use. The perioperative RN should assess the patient for risk for pressure injury, implement measures for prevention, and include in the hand-over communication to the next RN pertinent information related to the patient's position during the operative or invasive procedure. The perioperative RN must pay careful attention to patient safety, including safe positioning practices, to achieve high patient satisfaction and optimal perioperative outcomes.¹

REFERENCES

1. Guideline for positioning the patient. In: *Guidelines for Perioperative Practice*. Denver, CO: AORN, Inc; 2018:673-744.
2. Centers for Medicare and Medicaid Services HHS. Medicaid program; payment adjustment for provider-preventable conditions including health care-acquired conditions. Final rule. *Fed Regist*. 2011;76(108):32816-32838.
3. Fencel JL, Walsh A, Vocke D. The bariatric patient: an overview of perioperative care. *AORN J*. 2015;102(2):116-131.
4. Bennicoff G. Perioperative care of the morbidly obese patient in the lithotomy position. *AORN J*. 2010;92(3):297-309; quiz 310-312.
5. Al-Benna S. Perioperative management of morbid obesity. *J Perioper Pract*. 2011;21(7):225-233.

POST-TEST

POSITIONING THE PATIENT: SAFE PRACTICES

Multiple choice. Please choose the word or phrase that best completes the following statements.

1. Which of the following is a goal of patient positioning?
 - a. Maintaining circulation
 - b. Maintaining the patient's comfort and privacy
 - c. Protecting the patient from injury
 - d. Providing exposure for the surgical site
 - e. All of the above
2. All the following should be removed from the patient before surgery EXCEPT
 - a. hair accessories.
 - b. indwelling urinary catheters.
 - c. jewelry.
 - d. piercings.
3. Which of the following is the optimal position for the patient's head and neck during surgery?
 - a. Flexed
 - b. Laterally rotated
 - c. Medially rotated
 - d. Neutral
4. Which of the following is a suitable surface for patient positioning?
 - a. Multiple layers of blankets
 - b. Multiple layers of sheets
 - c. Surfaces specially designed to redistribute pressure
 - d. Warming blankets
5. Which of the following are acceptable for use as positioning devices?
 - a. Blankets
 - b. Pillows
 - c. Sheets
 - d. Towels
 - e. All of the above
6. Which of the following positions is most frequently used for surgical procedures?
 - a. Lateral
 - b. Lithotomy
 - c. Prone
 - d. Supine
 - e. Trendelenburg
7. Safe practices for tucking a patient's arms at the sides and securing them with a draw sheet include that the
 - a. draw sheet should extend from the mid-upper arm to the fingertips.
 - b. elbows should be extended as much as possible.
 - c. palms should face away from the body.
 - d. sheet should be tucked between the mattress and the OR bed platform.
8. Safe practices for extending a patient's arms on arm boards include that the
 - a. arm boards should be lower than the level of the OR bed.
 - b. arms and wrists should be maintained in neutral alignment.
 - c. arms should be abducted at least 90 degrees.
 - d. palms of the hand should face down.
9. Where should the perioperative RN place the safety strap for a patient in the supine position?
 - a. Below the knees
 - b. Directly over the knees
 - c. 2 inches above the knees
 - d. Upper thighs
10. Which of the following devices are suitable for patients in the Trendelenburg position?
 - a. Arm boards
 - b. Circumferential wrist restraints
 - c. Shoulder braces
 - d. Vacuum-packed positioning devices
 - e. None of the above

11. The lithotomy position causes which of the following physiologic changes?
 - a. Decreased venous return
 - b. Decreased leg perfusion
 - c. Decreased cardiac output
 - d. Decreased pressure on the diaphragm
12. Which of the following statements about the axillary support is most accurate?
 - a. A bag of IV fluids is the ideal axillary roll.
 - b. It should be made out of a rolled sheet or towel.
 - c. It should be placed in the axilla.
 - d. It should be wide enough to spread over several ribs.
13. Perioperative team members should implement which of the following practices when positioning a patient in the sitting or semi-sitting position?
 - a. Elevate the head as much as possible
 - b. Flex the knees 30 degrees
 - c. Hyperextend the head and neck
 - d. Use horseshoe-shaped head positioners whenever possible
14. Which of the following complications is associated with the prone position?
 - a. Abdominal compartment syndrome
 - b. Increased bleeding
 - c. Limb compartment syndrome
 - d. Stroke
 - e. All of the above
15. Physiologic changes associated with obesity include
 - a. decreased efficiency of air exchange during breathing and decreased incidence of gastroesophageal reflux.
 - b. decreased metabolic demand, decreased efficiency of air exchange during breathing, and increased incidence of gastroesophageal reflux.
 - c. increased blood volume and increase efficiency of air exchange during breathing.
 - d. increased cardiac output, decreased efficiency of air exchange during breathing, and increased blood volume.

POST-TEST ANSWERS

POSITIONING THE PATIENT: SAFE PRACTICES

- 15. *d*
- 14. *e*
- 13. *b*
- 12. *d*
- 11. *b*
- 10. *d*
- 9. *c*
- 8. *b*
- 7. *a*
- 6. *d*
- 5. *b*
- 4. *c*
- 3. *d*
- 2. *b*
- 1. *e*