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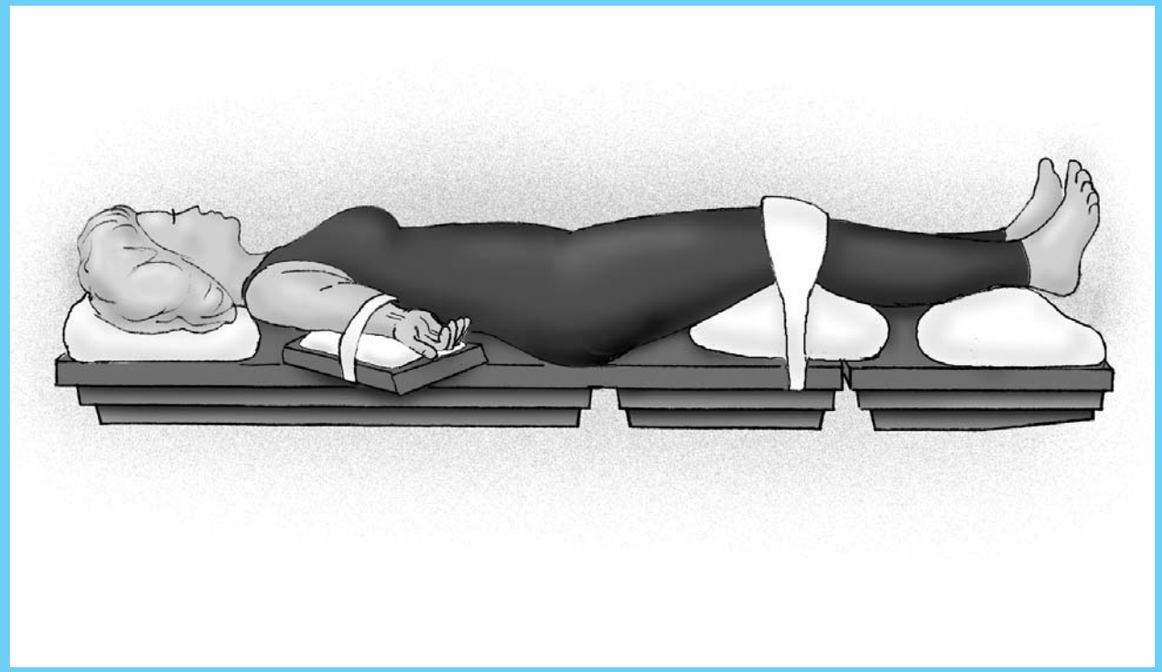
SAFELY POSITIONING THE SURGICAL PATIENT



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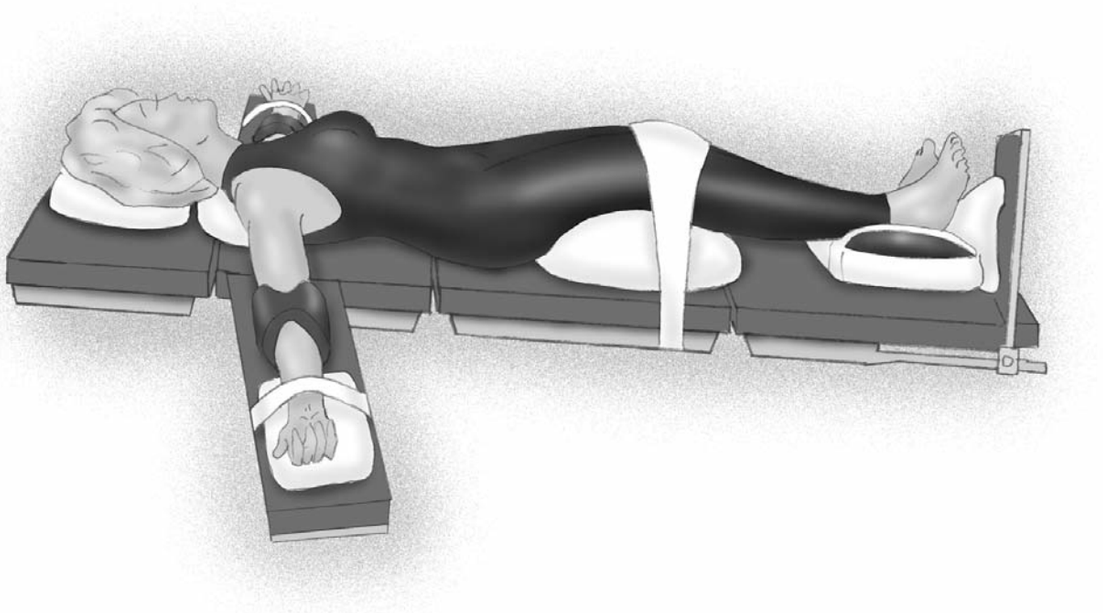
SAFELY POSITIONING THE SURGICAL PATIENT:

AORN INDEPENDENT STUDY ACTIVITY
AORN VIDEO WITH STUDY GUIDE



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PURPOSE/GOALS

This activity is designed to provide perioperative nurses with the knowledge needed to safely position the surgical patient.

OBJECTIVES

After viewing the video and completing this study guide, the participant will be able to:

- identify the potential patient injuries associated with positioning the surgical patient.
- describe the four most common surgical positions.
- discuss nursing interventions related to positioning the surgical patient.

INTRODUCTION

The Perioperative Nursing Data Set (PNDS) interpretive statement for the Outcome specific to positioning (i.e., The patient is free from signs and symptoms of injury related to positioning.) states that "Prevention of positioning injury requires application of the principles of body mechanics, ongoing assessment throughout the perioperative period, and coordination with the entire health care team. Preexisting conditions (e.g., poor nutritional status, extremes of age, vascular insufficiency, diabetes, impaired nerve function) may increase the patient's risk for injury. Other factors, independent of nursing care, (e.g., type and length of procedure, type of anesthesia) can contribute to the risk of positioning injury."[1]

PURPOSE OF POSITIONING

The purposes of positioning the surgical patient are to:

- achieve optimum surgical exposure while preventing injury to anatomic structures
- maintain the patient's physiological stability
- maintain a patent airway
- allow access to physiologic monitoring devices and intravenous lines.

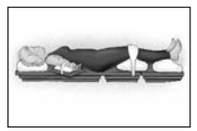
Proper positioning of the surgical patient is a shared responsibility of the perioperative team. Attention should be given to the patient's privacy, comfort and safety as well as to the effects of positioning on the neuromuscular, skeletal, circulatory, respiratory, and integumentary systems.

Responsibilities of the perioperative team members include the following:

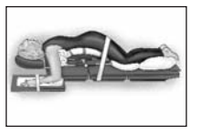
- the surgeon determines which patient position will provide optimal surgical exposure
- the anesthesia provider monitors and maintains the physiological functions of the patient
- the perioperative registered nurse (RN) uses the principles of body mechanics and knowledge of anatomy and physiology to determine the need for and prepare, apply or remove positioning devices that will provide surgical exposure in such a manner as to decrease the risk of injury related to positioning.

The basic surgical positions, along with several variations, that are used during invasive procedures are

- Supine
- Prone
- Lateral
- Lithotomy



Supine



Prone

Lateral

Lithotomy

Surgical patients are at increased risk for ischemic and mechanical injury due in part to the combined effects of uninterrupted pressure, forced immobility, and the effects of anesthesia. Ischemic injury occurs with increased frequency when there is high interface pressure or with the exposure to low pressure over extended periods of time. There is an increased incidence of injury to the skin and underlying tissues when there is pressure over weight-bearing bony prominences. The primary consideration when selecting positioning equipment is that it redistributes pressure, particularly over the more bony prominences. When positioning patients, and in particular when putting joints through range of motion, caution should be used to prevent stretching of the nerves. Extremes of position and hyperextension of the limbs and the head and neck should be avoided.

PROCUREMENT OF POSITIONING EQUIPMENT

Personnel who make purchasing decisions should determine which positioning equipment is appropriate for the needs of their patient population. The equipment should be designed using the best available evidence supporting its efficacy and designed to optimize safety features for both the patient and the personnel who will need to use it. It is important for perioperative personnel to be cognizant of the current research supporting the technology used to create mattresses, padding, and other positioning devices.

The primary consideration when selecting positioning equipment is that it redistributes the patient's weight thereby reducing skin interface pressure between the patient and the OR support surface. Capillary interface pressures greater than 32 mmHg may occlude capillary blood flow causing diminished tissue perfusion and ischemic injury. This injury may manifest as a pressure ulcer, especially over bony prominences. Capillary pressures have been shown to increase as much as 150 mmHg during prolonged, unrelieved pressure without position changes.[2] Current research has reported that foam overlays and replacements pads do not have effective pressure reduction properties.[3] The traditional OR bed mattress is constructed of one or two inch foam with a vinyl or nylon cover. Studies comparing the traditional foam mattress to the visco-elastic polymer pad have found the visco-elastic polymer technology to be more effective at pressure relief.[3] The research findings with various OR surfaces vary making it difficult to draw any firm conclusions as to which OR surface is the most effective means of intraoperative pressure relief.[3-5]

Criteria for Procedure Bed Surfaces

The following criteria may be helpful when making purchasing decisions:

- evidence supporting its pressure reduction or pressure relief properties;
- evidence to support the ability to achieve and safely hold the desired patient position;
- product is available in a variety of sizes and shapes;
- suitability for the patient population and positioning requirements;
- ability to support maximum weight requirements;
- durability;
- moisture resistance;
- low risk of moisture retention;
- radiolucent, if required;
- fire retardant;
- non-allergenic;
- ease of use and storage, and
- cost effective.

Special considerations (e.g. lateral transfer devices, patient lifts, procedure beds which will accommodate the patient's weight) should be taken for positioning equipment that will accommodate bariatric patients.

OR surfaces and positioning equipment should be evaluated according to AORN's recommended practices for product selection in the perioperative practice setting.

PREOPERATIVE PATIENT ASSESSMENT

The AORN "Recommended practices for positioning the patient in the perioperative setting" are used as guidelines for positioning the patient during operative and invasive procedures. According to the recommended practice, "during the planning phase of patient care, the perioperative registered nurse should anticipate the positioning equipment needed for the specific operative or invasive procedure."[6;p499] The perioperative RN should review the surgery schedule preferably the day before to plan for and identify availability of positioning equipment.[6]

The preoperative assessment specific to the prevention of injury related to positioning should identify patient specific considerations that require additional precautions for procedure-specific positioning. Additional precautions may also be warranted for certain patient populations (e.g., neonates, elderly, bariatric). The preoperative assessment should include, but is not limited to:

- age
- height and weight
- skin condition
- preexisting conditions
- presence of jewelry
- limited range of motion
- presence of prosthetics or other corrective devices

Intraoperative assessment factors should include, but are not limited to,

- position required
- surgical exposure
- type of anesthesia
- length of surgery

Aronovitch (1999) reported that the risk of intraoperative acquired pressure ulcer increased when the procedure time extended beyond three hours.[7] The following patient characteristics have been also shown to be predictive of increased risk of intraoperative pressure ulcers:

- patients > 70 years of age
- vascular procedures
- patients who are thin and small in stature
- patients with poor nutritional status
- patients who are diabetic

To ensure that the appropriate procedure bed and accessories and an adequate number of personnel are available to position the patient on the surgical bed, preplanning and an accurate assessment are necessary. All team members must participate actively and share in the responsibility of safely positioning the patient. The patient's needs must be communicated to the other members of the surgical team. Risk for perioperative positioning injury is the nursing diagnosis that is always applicable to positioning of the patient in the perioperative setting. All members of the perioperative team share the perioperative patient outcome of the prevention of positioning injuries and the goal for the patient to remain free from signs and symptoms of injury related to positioning. Based on the PNDS interpretive statement the prevention of positioning injury incorporates the application of the principles of body mechanics, ongoing assessment throughout the perioperative period, and coordination with the entire health care team. Preexisting intrinsic and extrinsic conditions (e.g., diabetes, vascular insufficiency, extremes of age, type of anesthesia, and length of procedure) contribute to an increased risk of positioning injury.[1]

The PNDS provides an excellent resource for identifying nursing interventions and activities for the plan of care and includes the following outcome indicators specific to perioperative positioning.

- The patient's skin condition should be smooth, intact, and free from ecchymosis, cuts, abrasions, shear injury, or blistering.
- The patient's cardiovascular status should include a heart rate and blood pressure within expected ranges; peripheral pulses present and equal bilaterally and the skin should be warm to touch.
- The patient's neuromuscular status should include the ability to flex and extend extremities without assistance and the absence of numbness or tingling of extremities.

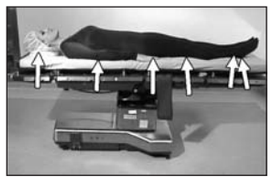
Upon completion of the procedure, the nurse should reassess the patient's responses to positioning. The PNDS provides examples of interim outcome statements that might be evaluated after surgery for the immediate post-operative period, such as the following.

- The patient's pressure points demonstrate hyperemia for less than 30 minutes.
- The patient has full return of movement of extremities at time of discharge from the OR.
- The patient is free from pain or numbness associated with surgical positioning.

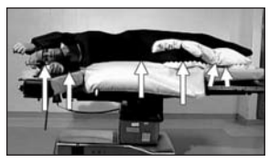
The PNDS provides a number of interventions and definitions specific to patient positioning. Each intervention has a unique identifier that may be used to codify the data when the PNDS is incorporated within electronic documentation and other databases. The following four data elements from the PNDS represent the perioperative nurse's unique contribution in the prevention of injury related to positioning.

- Identifies physical alterations that require additional precautions for procedure specific positioning
  - Determines those at risk for positioning injury and implements appropriate precautions.
- Verifies presence of prosthetics and corrective devices
  - Identifies presence of or use of prosthetics or corrective devices and modifies nursing care as indicated for planned procedure.
- Participates as part of a team to position the patient.
  - Determines the need for, prepares, applies, and removes devices designed to enhance operative exposure, prevent neuromuscular injury, maintain skin and tissue integrity, and maintain body alignment and optimal physiological functioning.
- Evaluates for signs and symptoms of injury as a result of positioning.
  - Observes for signs and symptoms of injury to integumentary, neuromuscular, and cardiopulmonary systems as a result of the patient's position during the procedure.

Each outcome has specific activities to assist the nurse in providing the intervention. For more information about activities or other elements of the PNDS you may refer to the *Perioperative Nursing Data Set* (Revised 2nd Edition).[1] The following link may be used for further information about this and other AORN publications. http://www.aornbookstore.org.



Pressure points must be well protected in each surgical position.



POSITIONING DEVICES

All devices should be clean and readily available before the patient is placed on the procedure bed. All team members should be familiar with the proper function and use of positioning equipment and devices. All equipment should be tested before use to help ensure patient safety and to minimize anesthesia and operative time.

Positioning devices may include, but are not limited to:

- support devices for head, arms, shoulders, chest, iliac crest, and lumbar area (e.g. kidney rests, chest rolls, bean bag type supports, padded headrest);
- pressure relief devices for pressure points (e.g., head, elbows, knees, ankles, sacral area);
- securing devices (e.g., safety straps);
- procedure bed and equipment (e.g., kidney braces, overhead arm supports, stirrups, foot boards); and
- specialty operative beds (e.g., fracture table).

Appropriate devices can help to distribute pressure more evenly and decrease the potential for injury. The use of gel pads or mattress overlays on the operating bed may decrease pressure by redistributing overall pressure across a larger surface area. Pillows, blankets, and molded foam devices, towels, other forms of padding may increase pressure rather than reduce pressure.[8] Proper equipment and positioning devices contribute to patient safety and assist in providing adequate exposure for the surgical site. Anatomical and physical limitations may dictate the type of positioning devices that can be used perioperatively. The risk of tissue and nerve damage increases when the procedure is longer than three hours.

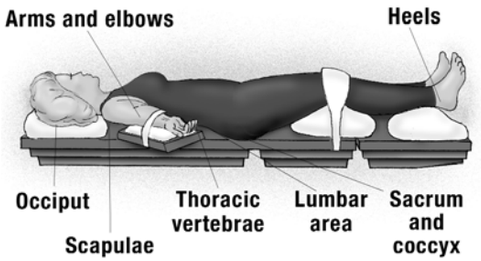
GENERAL SAFETY INTERVENTIONS

General safety considerations for all patients include:

- Providing for the patient's dignity and privacy when transporting, transferring and positioning the patient.
- Removing patient jewelry and body piercing accessories before transferring or positioning the patient. Leaving such adornments in place may snag and tear the patient's tissue during transfer and positioning
- Coordinating movement and positioning of the patient with the surgical team and providing adequate personnel to safely lift and position the patient. Avoid pulling or sliding the patient. This can result in shear injury to the skin and underlying tissues.
- Protect the airway and IV access at all times during transfer and positioning.
- Continually assess and reassess the body alignment (e.g., uncross legs) to reduce the risk of injury and dependent edema.
- Use OR surface and positioning equipment according to manufacturer's written instructions and within the specified patient weight limits.
- Confirm location of the patient's fingers to ensure they are clear of breaks in the bed or other moveable parts of the positioning equipment.
- Elevate heels off the procedure support surface.
- Position the patient's head in a neutral position on a head rest.
- The patient's arms should not be tucked at his or her side when in the supine position unless necessary for surgical reasons..
- Avoid direct pressure on the eyes.

SURGICAL POSITIONS

Supine



The supine position is the most commonly used position and generally poses the least risk of injury to the patient. The patient's arms should be positioned to protect them from nerve injury. When the arms are placed on arm boards, they should never be abducted beyond the patient's normal range of motion or at an angle greater than 90 degrees. Extending the arm greater than 90 degrees from the body in abduction may cause a brachial plexus injury. Improper positioning of the arms predisposes the patient to radial, medial, and/or ulnar nerve injury. When it is necessary for surgical reasons to place the patient's arms at his/her side, the arms should be secured at the patient's side with the use of draw sheet. The draw sheet should extend above the elbows and should be tucked between the patient and the procedure bed mattress. Tucking the patient's arms at their side may add pressure on the tucked arms, predisposing the tissue to injury and ischemia. Care must be taken when tucking the arms to avoid interfering with physiological monitoring and vascular access devices.

The palms should be placed along side the patient's thigh with palms facing the lateral aspect of the thigh.

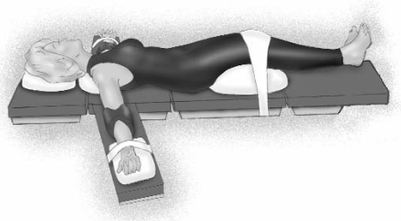
To minimize the risk of nerve injury, the patient's arms should be placed on padded arm boards with the palms facing up and the fingers should be extended. When the patient's arms are placed at the side of the body, they should be in a neutral position with the elbows slightly flexed, wrist in neutral position with the palms facing the lateral aspect of the thigh. The patient's extremities should be prevented from dropping below the procedure bed.

A lateral transfer device should be used for supine-to-supine patient transfer. The perioperative RN circulator is responsible for coordinating the necessary personnel and equipment to safely transfer, position and reposition the patient based upon the patient's body habitus and situational needs of the procedure. The anesthesia provider is usually the one member of team in the best position to direct the movement of the patient as they protect and maintain the airway during patient movement.

The supine position is used for most abdominal procedures, such as cholecystectomy, bowel and bladder surgery, and some gynecological procedures.

The supine position may be modified into a sitting or semi-sitting position for access to the shoulder, posterior cervical spine, or posterior or lateral cranium. There is an increased risk for poor venous return from the lower extremities and the pooling of blood in the patient's pelvis when in the sitting or semi-sitting position. These positions will be covered later on in this study guide. Trendelenburg's and reverse Trendelenburg's are also modifications of the supine position.

Trendelenburg's

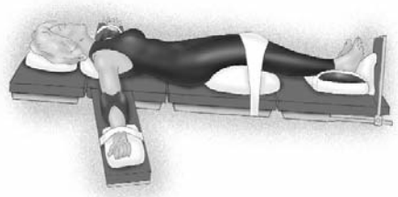


Trendelenburg's position is a 45 degree position in which the bed is tilted head down. This position has the most adverse effect on diaphragmatic movement with increased ventilatory effort. A modified angle also may be used. The patient may remain flat or the bed may be flexed at the knees. Areas susceptible to injury are similar to those in the supine position and the same precautions should be taken. The patient is at an increased risk for shear injury to skin and underlying tissue as the weight of the patient's body slides over the bed surface as the bed is navigated from the supine to the Trendelenburg's position. When the patient is in Trendelenburg's position, excessive pressure on the clavicle can compress the brachial plexus as it exits the thorax between the clavicle and the first rib. In a study of nerve injury associated with anesthesia it was reported that brachial plexus injuries were related to the use of shoulder braces and the head-down position. [9]

The Trendelenburg's position is contraindicated in patients with increased intracranial pressure (ICP) because lowering the head and thorax increases intrathoracic pressure, contributing to increased ICP. Trendelenburg's position also may cause an increase in intraocular pressure, which aggravates borderline or poorly controlled glaucoma. Blood volume shifts and, initially, blood pressure is increased because of increased venous return to the heart from the lower extremities. Blood pressure will drop gradually as stimulation of the baroreceptor causes a reflex general vasodilatation, resulting in a decreased perfusion of vital organs. There is also a risk of congestive heart failure (CHF) and masking of blood loss in this position.

The Trendelenburg's position is frequently used with supine positioning because it offers better visibility for the surgeon by displacing the viscera and increasing gravitational flow away from the surgical field.

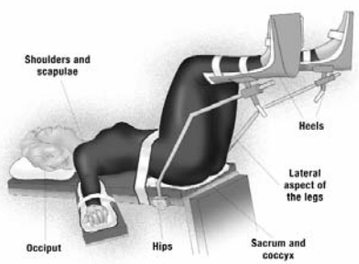
Reverse Trendelenburg's



In the reverse Trendelenburg's position the head is tilted up and a padded footboard is necessary to support the patient. There is increased venous pooling in the lower extremities. Mechanical venous thromboembolism may occur and preventative devices should be applied to the lower extremities to assist in venous return.

Reverse Trendelenburg's position may be used for head, neck, and endoscopic procedures (e.g., cholecystectomy).

Lithotomy



In the lithotomy position the patient's legs are supported in some type of leg holder while the patient remains on his or her back. The legs are flexed at the knees, and the lower legs are supported by a leg holder (e.g., stirrups). Modifications of this position include low, standard, high, and exaggerated positions depending on how high the legs and pelvis need to be elevated for surgical exposure.

The patient's heels are at risk for pressure ulcers at the heel support, particularly when the legs are supported by the heel in the standard, high or exaggerated lithotomy position for prolonged periods of time. The length of time a patient may remain in lithotomy without risk of injury is unknown and probably related to the patient's overall medical condition. Injury to the peroneal nerve on the lateral aspect of the knee is common and results from the fibular neck resting against the vertical post of the stirrup. Injury to the peroneal nerve may result in foot drop and lateral, lower-extremity paresthesia. Compartment syndrome, while infrequent, has been reported as a complication of this surgical position. There is an increased risk for venous pooling in lower extremities and in the patient's pelvis. There is also a risk for sudden hypotensive episode when the patient's legs are removed from the stirrups at the end of the procedure.

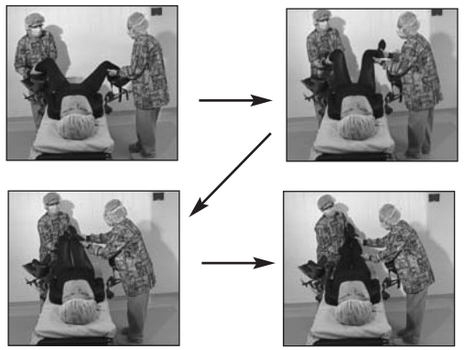
The four nerves most likely to be damaged in the lithotomy position include

- obturator nerve which can be compressed by undue flexion of the thigh to the groin,
- saphenous nerve which may be compressed against the medial aspect of the knee brace,
- femoral nerve which can be damaged by excessive angulation of the thigh with consequent compression to the nerve truck, and
- common peroneal nerve which can be damaged by compression on the lateral aspect of the knee.[6]

Injury to the peroneal nerve on the lateral aspect of the knee is common if the fibular neck is allowed to rest against the vertical post of the stirrup. Injury to the peroneal nerve may result in foot drop and lateral, lower-extremity paresthesia.[10, 11] The femoral and obturator nerves may be compromised on the medial thigh from the weight of personnel or instruments resting on the patient. The saphenous vein, tibial nerve, and the common peroneal nerve may be damaged by pressure from stirrups if they are misplaced or not padded. Various stirrups are available and must be of equal height and adjusted to the length of the patient's legs to prevent hip strain and tilting of the pelvis.

Special Considerations

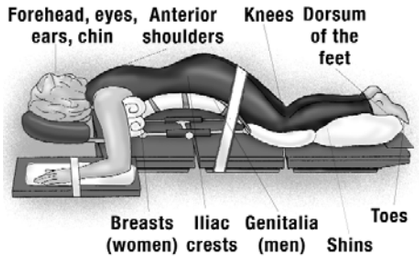
If the patient's arms are tucked at the side, particular attention must be paid to the placement of the arms and fingers to prevent skin contact with the metal parts of the bed and to avoid crushing injury should the finger fall within the moveable part of the procedure bed. The buttocks should be even with the break in the procedure bed to prevent pressure areas and to decrease lower back strain as the legs are lowered postoperatively.[6]



The legs should be removed from the stirrups slowly and brought together simultaneously. To maintain hemodynamic status, the legs should then be slowly returned one at a time, if possible, to the bed. Legs should never be abducted without externally rotating the hip. External rotation should always occur at the hip, not at the knee.

The lithotomy position is used for gynecological, urological and rectal procedures.

Prone Position



Patients that will not be intubated (e.g. patient's receiving moderate sedation/analgesia or a local anesthetic) will assume the prone position on the procedure bed under the direction of the surgical team. For those patients having a general anesthetic, the patient is turned onto the OR procedure bed to the prone position after being anesthetized and intubated on the stretcher in the supine position. This transfer from the supine position on the stretcher to the OR bed must be synchronized keeping the patient's whole body supported and in anatomical alignment. The patient is placed on chest rolls or a special frame. These supports should be placed along the lateral chest wall from the acromioclavicular joint to the iliac crests to allow free abdominal movement for respiratory effort and prevent pressure on the inferior vena cava. Both women's and men's breasts and genitalia should be checked after final positioning to ensure freedom from pressure. Breasts may need to be moved laterally to reduce pressure on them.

The loss of vision has been reported in patients undergoing spine surgery in the prone position. The prone position presents an increased risk for direct compression of the orbit and corneal abrasion. When turning the patient to the prone position using some of the specialty beds, there is an increased risk of decreased venous return from the head because it may be lower than the body. This cerebral dependent position may result in decreased venous return from the head with resultant capillary bed stasis and decreased perfusion to the optic nerve that can lead to blindness.[12] The patient's cervical neck is kept in alignment and the forehead, eyes, and chin are protected with the use of a

head rest designed to both maintain anatomical alignment of the spine while providing pressure relief properties to the face and eyes. Various products are available to meet this patient need while providing access to the airway by the anesthesia provider.[6]

Placing pillows under the lower leg prevents pressure from developing over the dorsum of the feet and toes and aids venous return by offering a slight incline to the lower legs. The safety belt should be placed at least two inches above the knees so as to not restrict circulation. A second safety belt may be placed across the patient's upper torso if the surgical site permits.

Ideally arms are placed at the patient's sides with palms turned inward, or they may be flexed above the head on arm boards at less than a 90 degree angle with the palms facing down. Placing a women's arms by her side rather than on arm boards may place more pressure on the breasts. In positioning the arms above the patient's head, slowly move the arms toward the floor and bring them up in an arc while the elbows are flexed. This movement helps prevent shoulder dislocation, brachial plexus injury, and other soft tissue injuries. Support the arms at the elbows and shoulders throughout this movement.

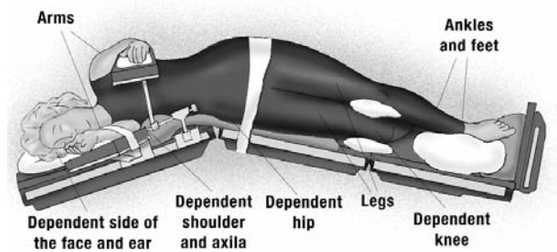
The prone position is used for surgery on the spine and for procedures involving the posterior aspect of the lower extremities and the rectum.

Jackknife Position

The Jackknife position is a variation of the prone position and the same considerations apply. With the OR procedure bed flexed about 90 degrees at the patient's hips, the potential for respiratory and circulatory compromise is increased. Padding with proven pressure redistribution properties should be used under the patient's hips to relieve pressure on the anterior superior iliac spine and male genitalia. Chest rolls should be on the lateral chest wall from the acromioclavicular joint of the iliac crest. A pillow or padding under the shins may be used to decrease pressure on the dorsum of the feet and toes. The patient's arms should be flexed on arm boards, palms down, using the same precautions outlined in the prone position. Pressure on the elbows and axilla must be prevented. The head is turned sideways and stabilized using a foam or gel headrest or a small pillow. The safety belt is placed two inches above the knees avoiding direct contact with the patient's bare skin. Wide adhesive tape may be secured to the inner aspect of each buttock and then attached to the OR procedure bed frame to provide surgical exposure to the anal area. Using tape in this fashion increases the risk of shear injury to the skin where the tape is applied.

The Jackknife position is used for proctologic examinations and procedures

Lateral Position



Patient's having a general anesthetic are usually anesthetized in the supine position on the OR procedure bed and then moved into the lateral position. The body should be aligned to prevent torsion of the spine and great vessels and to protect the airway. The patient is positioned on the non-operative side and this dependent side is the reference point for documentation. The lower leg (dependent leg) is flexed at the hip and the knee; the upper leg remains straight.

Preventative measures include placing padding between the knees and feet, and under the dependent ankle and knee. Padding placed between the knees helps to increase venous drainage in the lateral position. Women's breasts and men's genitalia should be checked and should be free from compresson or pressure. A foam or gel headrest or a pillow may be used to minimize pressure on the head. The head must be elevated to keep

the spine in alignment. The patient's dependent ear should be assessed to ensure it is not folded, and the ear should be well padded.

A safety belt may be used across the hips to help stabilize the patient in the lateral position. Additionally, kidney braces many also be used to provide stability. Padded supports are available that fit the kidney rests. The kidney braces are placed under the OR procedure bed mattress and should not come in direct contact with the patient. Suction positioning devices (e.g. bean bags) are available to support the torso.

The patient is also at risk for nerve injury when in the lateral position. The patient's upper arm must be supported on an over-the-bed arm board with the palm facing downward and the lower arm supported on an arm board with palm facing upwards. The lower shoulder should be slightly forward and an axillary roll used to prevent compression of the scapula and brachial plexus. Radial pulses should be checked frequently to assess adequacy of circulation because the axillary and brachial arteries may be partially compressed by a poorly placed axillary roll or by the weight of the shoulder girdle and chest. The peroneal nerve in the lower extremity is at risk of compression against the OR bed surface.

The lateral position has a variation used for procedures on the kidney. The OR bed is flexed until the muscles between the thorax and the pelvis are tight. The patient should be positioned so that the iliac crest is level with the break of the bed. The kidney rest may be raised for better surgical exposure; if raised it should rest against the soft tissue. The patient's feet and head are independent positions that encourage venous pooling and may lead to hypertension. Respiratory effort is compromised because of pressure on the lateral chest wall. This position may create a mediastinal shift and rotation of the heart. Cardiac output may also be decreased because of decreased venous return

The lateral position is used for hip and chest procedures. The flexed lateral position is used to optimize surgical exposure to the kidney.

Sitting Position

The sitting position is a variation of the supine position, and used for surgeries on the shoulder and cranium. While the sitting position is known to aide respiratory effort by the elevation of the head of the bed circulation may be impeded. An obvious problem is venous pooling in the lower extremities, resulting in hypotension. Venous return may be aided by use of intermittent pneumatic compression devices or graduated elastic stockings.

The point of maximum pressure in this position is the ischial tuberosities. Procedure bed surfaces with redistribution properties should be strongly considered, especially under the buttocks and small of the back of patients in this position. A problem associated with prolonged pressure on ischial tuberostiites is sciatic nerve damage. Stretch injury to the sciatic nerve is a result of improper positioning of the legs with prolonged extension of the knees. Thighs should be flexed and knees bent, placing the legs horizontal and level with the heart. The feet should be supported with a padded footboard and small pillow placed superior to the popliteal space. Heel protective devices should be used to prevent pressure on them.

The safety belt should be placed at least two inches above the knees and should not constrict circulation. The arms may be crossed in the patient's lap and secured. Elbows must be protected from compression against the OR bed. If a head holder is used, the perioperative nurse must be familiar with its operation prior to positioning. Special care must be given to the eyes in order to avoid injury to them. Air embolism is a threat in this position because of the negative venous pressure in the head and neck. The anesthesia provider may insert a central venous catheter with a Doppler device to extract air, which may be carried form the internal or external jugular vein to the heart. The Doppler is employed to provide audible detection of air embolism. The perioperative nurse should be aware that the operative site and catheter placement sites are potential areas for air entry.

CONCLUSION

In general we can summarize the basic nursing consideration related to positioning as the perioperative nurse should actively monitor the patient's body alignment and tissue integrity throughout the procedure based on physiologic principles. Safely positioning the surgical patient is a dynamic process that does not end once the patient is securely positioned on the OR procedure bed. After positioning, that patient should be assessed, and after any repositioning, the patient should be reassessed for correct body alignment. Changing the patient's position may expose or damage otherwise protected body tissue. An evaluation of the patient's body alignment should be accompanied by assessing respiratory, circulatory, neurological, musculoskeletal, and soft tissue considerations.

By ensuring the patient is in proper body alignment and supporting extremities and joints, the risk of injury is decreased during patient transfer and positioning. Patients should always be lifted when being moved because sliding or pulling the patient could result in shearing of tissue. When positioning patients with decreased flexibility, care must be taken to prevent neuromuscular stretching and straining.

DOCUMENTATION

"Patient care and use of positioning devices should be documented on the intraoperative record by the registered nurse circulator."[6,p516] Documentation provides a description of the nursing care provided, condition of the patient upon completion of the procedure, and provides information during the transfer of care that promotes continuity of care.

Documentation should include, but is not limited to:

1. preoperative assessment of the skin,
2. type and location of positioning equipment,
3. name and roles of the personnel who positioned the patient,
4. patient position, and if repositioned, secondary position(s) and why,
5. postoperative assessment findings and whether or not the outcome "free from signs and symptoms of injury relate to positioning."[1,p43] was attained.

Each facility should establish policies and procedures related to patient positioning to establish authority, responsibility and accountability.

SUMMARY

Positioning the surgical patient is a very important aspect of perioperative nursing. The perioperative registered nurse has the responsibility of planning, overseeing, and documenting the care of the patient and must understand the principles of patient positioning to decrease the patient's risk of injury.

There is an increased risk for patient injuries to occur when positioning the patient and this presents a challenge to the entire surgical team. With proper positioning and correct body alignment that risk is lessened. By following the recommended practices as guidelines, the perioperative registered nurse and other team members can reduce the risk of intraoperative complications related to positioning and ensure the patient is free from injuries related to positioning

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POSTTEST

1. In the lithotomy position, legs must be raised and lowered slowly in order to
   a. prevent the patient from falling off the bed.
   b. allow blood volume changes to adjust and prevent torsion injuries.
   c. reduce the potential for nerve damage to the brachial plexus.
   d. allow adequate lung expansion.

2. Chest rolls or special frames must allow for
   a. maximum chest expansion.
   b. free abdominal movement.
   c. venous return through the inferior vena cava.
   d. all of the above.

3. Parallel forces to soft tissue may damage peripheral blood vessels and/or cause abrasions. This can be caused by pulling instead of lifting a patient and is called
   a. bruising.
   b. scraping.
   c. shearing.
   d. torsion.

4. A common nerve injury for patients placed in the supine position is
   a. brachial plexus injury.
   b. obturator nerve injury.
   c. heel decubitus.
   d. pulmonary emboli.

5. Padding the elbows protects the _____ nerve.
   a. brachial
   b. ulnar
   c. radial
   d. popliteal

6. In the lateral position, the dependent leg is _____ and the other leg is_____.
   a. extended, flexed
   b. flexed, extended
   c. flexed, flexed
   d. extended, extended

7. Diaphragmatic movement is most adversely affected by which of the following positions?
   a. Trendelenburg
   b. Lateral
   c. Modified Fowler's
   d. Dorsal recumbent

8. The optimum patient position during the operative procedure is best described as a position that provides
   a. access and exposure, maintains circulatory and respiratory functions, and does not compromise neuromuscular structures.
   b. optimum access and exposure to the surgical site, with no permanent compromise to neuromus cular structures.
   c. access for the surgeon, does not compromise the neuromuscular structures and maintains an adequate airway for the anesthetist.
   d. sustained circulatory and respiratory functions, does not compromise neuromuscular structures, and maintains body alignment.

9. In the lateral position, preventive measures include
   a. pillows between the knees and feet.
   b. extra padding if the patient is thin.
   c. padding under the dependent ankle and knee.
   d. a & c
   e. all of the above.

10. What is most important for the team approach to patient care?
    a. Cooperation
    b. Communication
    c. Education
    d. Economics

11. The PNDS should be utilized to
    a. determine interim outcomes.
    b. determine interventions.
    c. determine the resources need to position the patient.
    d. a & b
    e. all of the above.

12. The goal of the perioperative nurse in positioning the patient is to
    a. provide an accurate patient assessment.
    b. prevent injuries.
    c. serve as the surgeon's assistant.
    d. maintain communication methods.

13. When putting joints through their range of motion, caution should be used in order to
    a. avoid increased venous return.
    b. prevent stretching of the nerves.
    c. prevent shearing.
    d. prevent maceration.

14. Documentation of the nursing care delivered related to positioning should include
    a. skin assessment pre- and postoperatively.
    b. type and location of equipment used.
    c. patient position and personnel participating.
    d. all of the above

15. Which of the following positions is used for most abdominal procedures?
    a. Supine
    b. Lateral
    c. Prone
    d. Lithotomy

Safely Positioning the Surgical Patient
Answer Sheet

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

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