

Supine Position

Adrian Sarli

Introduction:

The supine position is the most widely used patient position in abdominal surgery. This position is ideal for access to the peritoneal cavity and is the position of choice for operations such as exploratory laparotomy, bowel resection, cholecystectomy and appendectomy. It is widely used in laparoscopic as well as open surgery with some slight differences in patient positioning. It can also be used for head and neck operations such as thyroidectomy, neck dissection and tracheostomy, as well as some operations on extremities. Each of these operations will have slight variations in positioning.

Despite being one of the most common positions used in surgery, supine positioning is not without risks. These include the risk of pressure injuries, ulnar nerve injuries, brachial plexus injuries, and cervical spine injuries.

Careful positioning and padding is vital to minimize these risks. Check that the patient is in the proper position prior to starting the case, and then make sure that the patient is periodically checked to ensure they did not shift.

It is important to think through each step of the planned operation prior to starting to ensure the patient is properly positioned to make your job easier.

Supine positioning can be accomplished with the following steps:

- Prepare equipment
- Transfer patient to OR table
- Position patient, considering the use of positioning adjuncts as needed
- Recheck patient position frequently during case

Steps:

1. Transfer patient to operative table. If the patient is able to transfer themselves, this is often preferred. Otherwise, a slide board can be used. Typically 3-4 people will be needed to transfer a patient.
2. Have the patient lie supine on the table with arms at their sides while monitoring equipment is attached and anesthesia initiated. See [Airway Management and Endotracheal Intubation](#)

3. Secure the endotracheal tube well and protect the patient's eyes by taping the eyelids shut.

4. Position arms:

Arms can be tucked at the patient's side. The advantage to tucking arms is that this allows the surgeon to stand closer to the ipsilateral shoulder. This can be helpful in some operations. For example, in a laparoscopic appendectomy, the left arm is usually tucked, allowing the surgeon and assistant to stand on the patient's left and aim the camera and operating instruments towards the right lower quadrant.



Proper technique: the arm holder is tucked under the mattress at the level of the patient's forearms with adequate padding. The majority of the arm's weight rests at the patient's side on the mattress, not on the armboard itself. There is no pressure on the ulnar groove of the elbow.

Supine Position

Adrian Sarli



Patient positioned in supine position with arms tucked for a laparoscopic procedure. The sheet was folded in half longitudinally and placed on the bed before the patient lay down. Note that arms have been tucked loosely enough to allow adequate circulation with thumbs up. The patient is adequately secured for the extremes of table tilting that will be required for laparoscopic surgery, including a footboard and safety straps. Arm holders, like those in the previous picture, can be used as an adjunct to protect the patient's arms and prevent them from falling out.

Alternatively, the arms can be extended using armboards. This allows the anesthesiologist to obtain further IV access if needed and better access to the arms. This can also be helpful in obese patients, especially when the operating table is narrow. Traditionally, this is the positioning used during an exploratory laparotomy.



Patient properly positioned in supine position with arms extended. Note that arms are at slightly less than 90°. Ideally, the patient is adequately secured to the table with safety straps on torso or thighs, and arms are secured to arm boards with proper padding.

Head positioning: During head and neck operations, a shoulder roll can be placed to extend the neck, and a head ring may be used to support the patient's head and relieve the cervical spine



Patient positioned with a shoulder roll and head ring to allow for head and neck operations, rigid esophagoscopy, etc.



A more extreme extension of the neck allows a direct passage from the incisors to the esophagus, as for rigid esophagoscopy. It is even more crucial to assure that the head is supported to avoid cervical spine injury. See "Pitfalls" below.

Foot-board: Movement can be further restrained by a padded board that attaches at a right angle to the operating table, below the patient's feet. This prevents the patient from sliding towards their feet when the operating table is tilted, as shown below.

5. After patient positioning on the operative table is accomplished, the table can be tilted appropriately for the procedure to be performed.

Supine Position

Adrian Sarli

Trendelenburg position: Tilting the head of the bed downwards can be helpful for pelvic procedures or laparoscopic appendectomy.



Trendelenburg position. Note the use of shoulder holders to prevent the patient from sliding. Source: Jmarchn, CC BY-SA 3.0 via Wikimedia Commons

Reverse Trendelenburg position: Tilting the head of the bed up is helpful for upper abdominal laparoscopic procedures.



Reverse Trendelenburg position. Note the use of a footboard to prevent the patient from sliding. Source: Saltanat ebli CC0, via Wikimedia Commons

Semi-Fowler position: For head and neck procedures, it can sometimes be helpful to position the patient in a semi-sitting position with the torso at 30-45°. This can improve venous drainage from the operating area and potentially minimize bleeding.



Patient in Semi-Fowler, also called “Beach Chair” position. Raising the head and torso like this decreases venous distention and bleeding. The surgeon must be cautious to avoid venous air embolism: in case of any injury to large veins, air can be drawn into the venous system when the patient is in this position.

“Side up” (Rotated) positioning can be useful for laparoscopic or open operations targeting the right or left side of the abdomen, such as cholecystectomy, appendectomy, splenectomy and colon procedures. Achieving this position involves rotating the bed in the sagittal plane, also known as “airplaning.” Some beds may not have this capability.



An operating table in Reverse Trendelenburg position with left side “airplaned” upwards. This position would be useful for an operation in the left upper quadrant of the abdomen, such as an open splenectomy.

6. During surgery, ensure that the operative staff check the patient’s positioning periodically.

Supine Position

Adrian Sarli

Patients can slide, and this could cause injuries. For example, if the patient is positioned in the Reverse Trendelenburg position with arms abducted, the patient can slide down and hyperextend the arms, causing brachial plexus injury.

Pitfalls

1. When significant patient tilting is involved, such as in many laparoscopic cases, ensure patient position is checked frequently. When the patient is in the Reverse Trendelenburg position, any sliding can place the arms at $> 90^\circ$ and increase the risk of brachial plexus injury.
2. Make sure that the neck is adequately supported to avoid cervical spine injuries. If using a shoulder roll, ensure that the patient's head is supported by a small pillow, head ring, or positioning gel pad to avoid hyperextending the cervical spine.
3. Ensure the patient is secured so as not to fall off the operative table! Limbs can fall off more easily than the entire patient, so ensure these are especially carefully checked. Be sure to use positioning adjuncts such as footboards, shoulder holders, safety straps. A deflatable "sandbag," as described in [Left Lateral Decubitus Position](#) can also be used for the supine position if extreme tilting of the table is anticipated.
4. Avoid allowing air into the venous system at any time, which can cause a fatal air embolism. Air can be sucked into the internal jugular vein and cause an air embolism when the head is elevated and venous pressure is low. The risk is greater if the patient is taking breaths and generating negative thoracic pressure. This is a higher risk when using a position such as Semi-Fowler's or Reverse Trendelenburg and operating on the venous system.



The patient's neck has been extended and secured using a head ring and shoulder roll as described above. The surgeon now pushes gently downward on the patient's forehead. If the head moves further, it is supported by the cervical spine and not the head ring. The head ring should be raised to address this situation.

Adrian Sarli, MD

University of North Dakota School of Medicine
North Dakota, USA

December 2022