

Approach to Positioning the Patient and the Surgeon

Richard Davis

Introduction:

You probably did not get much training in positioning the patient, and even less on positioning yourself. But this is a discipline you cannot ignore: an operation goes better when the patient, the surgeon, and the operative team are positioned well. Visibility is better, the hand is steadier, the operation goes more smoothly, and everything just seems to “work.”

An excellent surgeon will set up the table height, the patient position, the lights, and the assistants without seeming to expend any effort at all. Others might not even realize that this setup has occurred. And then the operation “just” goes well, without any problems. But be assured, a lot of thought and preparation has gone into this seemingly effortless process. Remember, a complex skill is nothing more than a series of simple skills performed simultaneously or in close sequence.

In this chapter we want to break down the complex skill of “setting up an operation” into its simple steps:

Choosing a position

Look for the easiest and safest position that will allow you to accomplish your goal. For example, when operating on a perianal abscess, does the patient really need to be in prone jack-knife position, or can you see what you need to in the much safer, and quicker to achieve, lithotomy position?

Supine > Lithotomy > Lateral decubitus > Prone

In general, the farther you get to the right in the above equation,

- the longer and more complex the setup
- the longer the time anesthesia needs to put to sleep and awaken the patient,
- the longer the turnover time between cases, and
- the more danger to the patient from positional injury.

Putting the patient in position

If there is anything unusual about the operation, be present in the room during the

positioning of the patient. This is especially true if the patient is unstable. While there, don't make a nuisance of yourself or tell the professionals how to do their jobs. But do clarify where the incision will be, where you will stand, and other details that will help in the positioning. If you will be tilting and rotating the patient into extreme positions, use a beanbag or other ways to restrain the patient, and prepare these before the patient gets on the table.

Once the patient is positioned, do a quick and silent “time out” and ask yourself these questions before the team starts to prepare and drape and you go off to scrub.

- Does the position look “natural?” Can you imagine yourself lying like that for several hours? Or are the shoulders or hips abducted excessively? Is the neck hyperextended or excessively rotated? Do the wrists, elbows, knees and ankles look comfortable?
- Is the head well supported? Or is it being supported only by the extended neck? If the head “bounces” when you press gently on the forehead, it is being held up by the cervical spine! Put another folded sheet underneath it, or under the heading that is holding it.



Pushing gently downward on the patient's head after extension of the neck with a head ring and shoulder roll. If the head moves further, it is supported by the cervical spine and

Approach to Positioning the Patient and the Surgeon

Richard Davis

not the head ring. The head ring should be raised to avoid this situation.

- Is there pressure on nerves anywhere? Consider the peroneal nerve over the fibular head, the ulnar nerve in the ulnar groove, the radial nerve at the mid-humerus, and the sciatic nerve lateral to the ischial tuberosity.
- Is there pressure on other structures anywhere? Consider the eyeballs, the nose, lips and ears, the breasts, the testicles, tension on the foley catheter.
- When you flex the bed, or raise the head or foot board, what will be the effect on the patient? Are there fingers or other appendages near any mechanical joints where they could be pinched or amputated?
- How far could you rotate or angulate the bed before the patient is in danger of sliding out of position? Are there restraints to prevent sliding? Make a mental note of how far you dare go, it will be harder to visualize this when the patient is under drapes.
- Is there room for you or your assistant to stand where you need to? Would you have more space if the table was moved away from anesthesia, or rotated 90 degrees?
- Are the laparoscopic / endoscopic monitors in the position that you and your assistant need them to be in?
- Are the overhead lights in position? Is your headlight on your head?
- Are the settings on the cautery adequate?
- Are the devices you may need, such as implants, hardware, or staplers, available? What about any equipment you'd use if things went wrong and you had to implement your backup plan? (You have a backup plan for every situation, right?)

Illumination

Most of the time, the OR lights are mounted to the ceiling directly above the patient, two shafts connected by an “elbow” that rotates 360 degrees and allows movement up and down. Before you scrub, adjust the two “elbows” so they are facing away from each other. Having the elbows pointing away from

each other allows you to adjust each light independently as the situation demands.



These lights may be shining where the surgeon wants them, but it will be difficult to make any adjustments.

If you are using a floor lamp, put it in the position you would like before you scrub. If it is to be positioned directly behind you, show that position to the circulator and then slide it backwards before you go scrub, so that the circulator can easily return it to that place once you are in position.

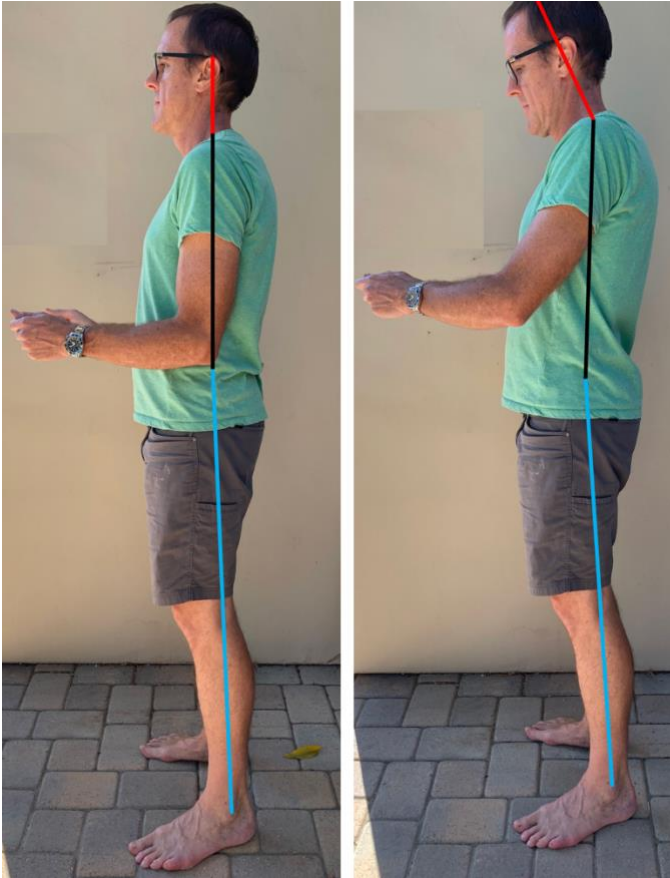
If you are using a headlight, hold up your hands in a place that is directly in front of your face, at about elbow level. Position the beam so that it shines directly on your two thumbnails. Remember that neck and back pain increase as the headlight gets heavier, so consider investing in a lightweight system.

How to stand

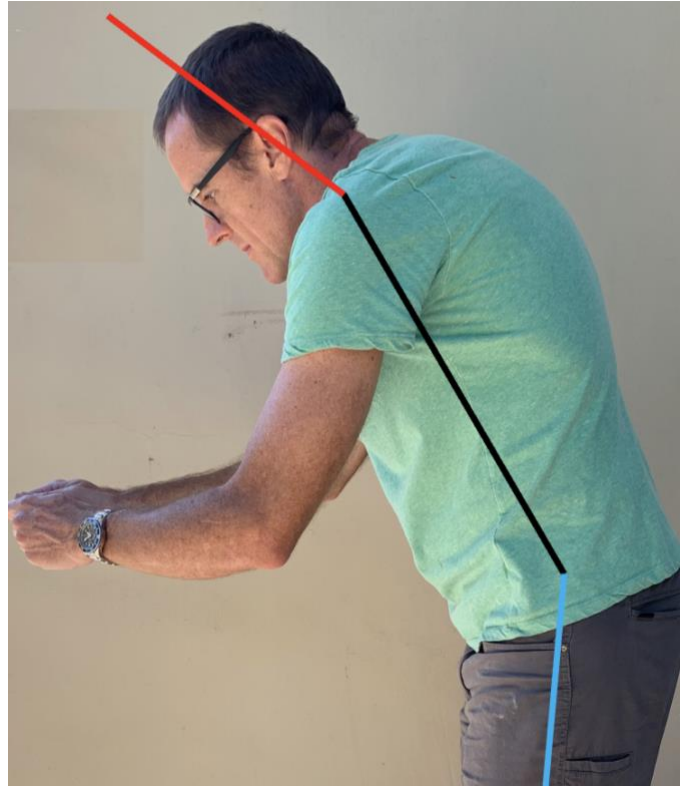
Consider the figure below, the so-called “Neutral Posture.” This position, as described in the field of Ergonomics, places muscles at their resting length, neither contracted nor stretched. It applies the least pressure on nerves, tendons, joints, muscles, and spinal discs. The ears are centered over the shoulders, over the hips, over the knees, over the ankles. This is the position that you can stand in comfortably for the most time.

Approach to Positioning the Patient and the Surgeon

Richard Davis



Left: Classic Neutral Posture, the position at which most of the muscles in the body are at their resting length. Right: Neutral Posture adapted for surgery. The forearms are advanced forward and the neck is flexed no more than 15 degrees.



Poor posture: operating in this position for a long time will result in pain in the neck, shoulders, and lower back. The hands may be steady at first, but as back and shoulder muscles fatigue, the hands will become increasingly unsteady.

For open surgery, start in the Neutral Posture and slide your forearms forward while maintaining them in a horizontal supported position. Bend your head forward to see what you are doing. Ideally your neck will flex no more than 15 degrees.

You will find that over a long surgery your body position “declines,” as described further below. Counter this by positioning, and repositioning, the patient so that you are as close to the Neutral Posture as possible throughout the surgery. As the surgery progresses, reposition the patient in order to move yourself closer to the Neutral Posture.

For video-assisted surgery you will position the monitor so that it is at or just below eye level, and your instruments such that your shoulders are relaxed, your arms are as close to vertical, and your forearms are as close to horizontal as possible. It is quite acceptable to rotate the patient into extreme positions in order to accomplish this, as described further in the Chapter “Principles of Laparoscopy-Port Positioning and Placement.”

Positioning the patient for open surgery

Steady fingers depend on firm support of the hand, wrist, forearm and elbow. These will be supported by the whole body. The shoulders should be in a natural position. The upper arms should be close to vertical. The forearms should be horizontal; adjust by raising the table so that the level you are operating on is level with your elbows. If you are seated, the seat and the table can both be adjusted to achieve this level. If possible, your entire arm should be resting on a solid surface from the tip of the elbow

Approach to Positioning the Patient and the Surgeon

Richard Davis

all the way to the metacarpals. The wrist should be straight, rather than flexed, if possible.



The steadiest hand needs forearm support all the way from the elbow to the metacarpophalangeal joint.



Position the table at the height of your elbows so that you can support as much of your forearm and hand as possible.

As the surgery progresses, you will find that your position changes. Possibly you move deeper into a body cavity, or possibly you are drawn to one side of the field. Remember to reposition your body and the table so that your head is not rotated, your neck is flexed forward as little as possible, and your forearms are well supported and as close to level as possible.



When this operation began, the table was at the correct height for opening the abdomen. But now the work is deeper: the patient should be repositioned.

Approach to Positioning the Patient and the Surgeon

Richard Davis



The table has been raised and rotated towards the surgeon, who is now closer to the Neutral Posture.

Often you will be resting your forearm and wrist on part of the patient.

- Operating in the groin or pubis, steady your arm on the patient's thighs. Operating in the neck, steady your arm on the patient's chest.
- Operating on the wrist or hand, use the width of the armboard to support yourself: adjust the table height and position yourself so that as much of your forearm as possible is steadied by it. If you are seated, keep your torso upright and flex your neck no more than 15 degrees.
- Standing at the head of the bed operating on the scalp or brain, use a table or other device to steady your forearm, especially for long or delicate operations.

This need to have your arm resting on something steady will be one of the factors that determines where you stand. Consider for example a surgeon performing an open operation on the

ascending colon. When standing on the patient's right, the surgeon has to bend at the waist a bit and raise the elbows and shoulders in order to work in the depths of the right abdomen.



The surgeon standing on the same side as the intra-abdominal pathology has to bend at an awkward angle.

On the other hand, standing to the patient's left, the surgeon's arms can rest on the chest or upper abdomen. The surgeon reaches over into the right side of the abdominal cavity in a natural way, maintaining an upright posture.

Approach to Positioning the Patient and the Surgeon

Richard Davis



After moving to the other side of the table and raising and rotating it, the surgeon can now stand more comfortably while operating inside the abdomen.

Sometimes you are not able to rest your forearm all the way back to the elbow. Examples include operating on the head, shoulder, or sole of the foot. If this is the case, it is even more important to have the rest of your body relaxed. Make sure that you are operating at the level of your elbows, and that you are standing up straight with your shoulders relaxed and your neck not bent more than 10-15 degrees. Consider sitting down or tilting the table to see better. If your work is delicate, bring in another table or instrument stand to steady your forearm and wrist.

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