Handedness and Its Impact on a Career in Medicine

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Abstract

Left-handedness in a world of right lateral bias can be an invisible barrier both in everyday life as well as in medical career development, and throughout a medical career. Common everyday life actions, including screwing in lightbulbs, inserting a screw, or any action that requires a clockwise rotation, is designed for "righties," making life for "lefties" a challenge. Other examples include writing without a slant or without smudging. In medicine, the physical examination of a patient is taught using the right hand and standing on the right side of the patient, an awkward situation for left handers. Another major concern in medicine specifically, is handwriting—notoriously poor in lefties—impacting legibility in progress notes, prescriptions, and medical records. In surgery and other procedural specialties in particular, using instruments intended for right-handed individuals, including suturing and positioning at the operating room table, presents left-handed individuals with particular challenges. Left-handed medical students and residents are especially vulnerable, as they may feel uncomfortable requesting special accommodations for their "handedness." The significance and impact of handedness often go unrecognized, yet may play a substantial role in career choices: the difficulties of being left-handed may dissuade students from pursuing their desired career. Solutions are available, including using instruments designed for left-handers (or learning to use "righty" instruments), and positioning at the operating room or procedure table as preferred by the left-handed individual. These solutions often require a cooperative attitude by colleagues. The authors describe the significance of handedness, including their own personal experiences, and offer some solutions for left-handed individuals who struggle to adapt to a right-handed world.

Right lateral bias is present in everyday life and usually goes unnoticed. Can openers, the location of water fountain handles, screwing in lightbulbs, inserting a screw—everything that requires a clockwise rotation is designed for "righties," making life for "lefties" a challenge. This includes writing without a slant, or without smudging if using a fountain pen. Author Victor is left-handed and was compelled in childhood to write with a fountain pen, so he learned to write in a very nonergonomic manner, with his fingers pointing downward (Figure 1). His resulting handwriting was and still is dismal. In our youth, well before email, digital phones, and video calling, we would write to each other to catch up while living far apart: it was not uncommon for Roberta to seek help from her pharmacist to interpret Victor's letters. Even spiral notebooks create obstacles for a left-handed writer. Literature is now available to help left-handed children learn how to minimize the difficulties of writing with their left hand.[1]

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The Impact of Left-Handed Writing in Medicine

These challenges are accentuated in the field of medicine, especially (but not exclusively) in surgery.

Before the advent of the electronic medical record (EMR), unintelligible handwriting (common with left-handed individuals) resulted in miscommunication, creating confusion or errors in progress notes, written operative notes, and prescriptions. Illegible prescriptions have resulted in errors including administration of the wrong drug, dosage errors, and errors in administration such as method or frequency. Some legal firms have made this issue their professional focus.[2] Widespread use of the EMR has decreased, but not eliminated, this problem.

How Left-Handedness Affects a Career in Medicine

Left-handedness may provide an invisible barrier to an individual's medical career development, especially, but not exclusively, in procedural specialties and surgery.[3] Challenges range from using tools that are tailored to right-handed individuals (e.g., scissors), to positioning of equipment and personnel. Attending surgeons may find teaching left-handed residents challenging, but coming to this recognition and adjusting can be helpful for both instructor and learner. It may be helpful for left-handed medical students and junior residents to identify and connect with left-handed senior residents or attendings, who can mentor them from their own experiences in overcoming barriers.[4] The issues facing left-handed individuals in surgical or interventional fields are often underrecognized, possibly because left-handed individuals represent only approximately 10% of the U.S. population.[5] Nonsurgical specialists often affected by handedness include left-handed radiologists (especially interventional radiologists), anesthesiologists, and endoscopists.

One of the first skills taught to medical students is the physical exam, which is done from the patient's right side, allowing the dominant right hand to palpate and percuss. Left-handed physicians learn to palpate the right subcostal area (usually to assess the liver) with their right hand. They have an advantage when examining the left subcostal region, and many right-handed physicians also learn to do this with their left hand.

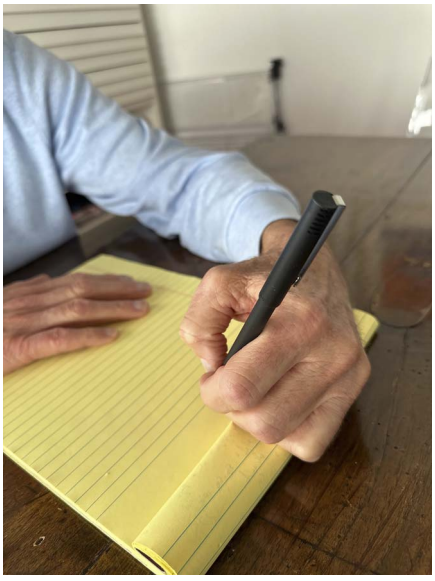

Figure 1 Author Victor G. Sonnino writing left-handed.

Suturing is also taught to all medical students and may require some adjustments for left-handed students. The needle is usually right-loaded on a needle holder; a left-handed student may choose to rotate the needle by its tip to properly orient it for suturing. The ratchet mechanism on clamps and needle holders functions as a one-way lock, with pressure applied more naturally by righties. Students are usually aware by this time that, when used in the left hand, scissors do not cut and needle holders will be awkward, and have figured out the work-around that is best for them.

Does Being Left-Handed Discourage Students From Becoming Surgeons?

Depending on their experience during clinical rotations, left-handed medical students may be discouraged from pursuing careers in certain specialties due to issues related to their handedness. This is unfortunate, as experience has shown that left-handed individuals at times show a greater inclination toward specialties seemingly unfriendly to left-handers. Beehler et al,[6] in a review of the prevalence and impact of left-handedness in neurosurgery, found that 17% of participating neurosurgeons were left-handed. The authors commented that "left-handed neurosurgeons may be overrepresented in neurosurgery, yet handedness is rarely addressed in neurosurgical training." They and other researchers[7] have found that adaptation to a right-handed environment occurs almost universally during specialty training.

How to Overcome the Obstacles of Being Left-Handed

Overcoming potential barriers of left-handedness requires individual initiative: the medical "system," in general, does not yet provide solutions for left-handed people, who instead must adapt on their own. It may be daunting for students and trainees, who are expected to assist senior physicians and surgeons, and may be expected to function as a "righty."

Left-handed instruments may be a solution to some of these technical challenges, but, to our knowledge, very few left-handed residents have access to them. Such instruments also tend to be more expensive—so much so that many attendings, including Victor, choose not to use them. Helpful and accommodating attendings during training will either teach left-handed trainees how to position themselves and use instruments intended for right-handed trainees, or will help them adopt their own operative strategies (e.g., on which side of the operating table to stand) in ways that will optimize their training experience. Without this helpful attitude, the potential consequences are wide ranging. Students may feel discouraged from choosing a field they are passionate about, out of fear that it may be "impossible" for a lefty. Regardless of whether this is just a perception or a reality, the consequence is that some students may choose to not "test the system," and opt for a specialty where handedness is irrelevant. This may not only keep some students from entering their "dream" specialty, but will also deprive the specialty of individuals who may be uniquely gifted for it.

Another potential difficulty rests with operating room staff who may not be prepared to accommodate the needs of a left-handed surgeon, or who may need time to adjust to a different layout of the room, special instruments, etc. This may require some special training for staff on how to adjust to left-handed surgeons and trainees. Rightward bias begins even before starting a surgical case: scrub nurses are trained to assist the surgeon to glove right-handed first. There is one notable exception: at the Mayo Clinic, surgeons glove left-handed first,[8] in homage to the left-handed Mayo brothers. It is important to note that left-handed nurses and technicians have reported facing similar problems, and at times even report facing discrimination in the operating room.[9]

As discussed, surgical instruments for left-handed surgeons are available to accommodate the different pressure applied by left-handed individuals: examples include scissors, needle drivers, and hemostats. Some left-handed surgeons do not avail themselves of this option, instead learning to use and share most right-handed surgical instruments. There are, however, situations where this may not be optimal, as in the example of Victor's experience when sharing titanium microsurgery instruments with his right-handed partner. Differently applied pressure on the springs caused them to function differently. This ultimately required the purchase and availability of 2 separate yet identical sets that adjusted to the pressure of the 2 surgeons differently over time.

The handedness issues are likely different for senior attendings versus trainees: attendings have the prerogative of standing where they prefer, and using instruments suited to them. Trainees, even if they are the "operating" surgeon, may not always have this privilege. Change in this attitude is long overdue: during training, surgical attendings should allow trainees to stand on the side of the operating table that is most comfortable for them when those trainees are the operating surgeon. With notable exceptions (which we discuss below), in many surgical specialties, it is customary for the operating surgeon to be on the

right side of the patient, and the first assistant on the left. With a left-handed resident functioning as the operating surgeon, they should be allowed to stand on the side that is most comfortable for them. Author Roberta, who is right-handed, found that the operating room environment was more efficient and pleasant when her left-handed trainees were allowed to stand on their preferred side. This would also require an adjustment on the part of the remainder of the team. Routinely training staff (registered nurses, technicians, etc.) how to adjust to left-handed physicians or surgeons would avoid confusion at the time of treating a patient.

Personal Experience With Being a Left-Handed Neurosurgeon

There are specific situations where a left-handed surgeon may require a significant change in the operating room setup. For example, use of an operating microscope may require opposite positioning for left-handed surgeons, thus also affecting the positioning of assistant(s), the scrub nurse, and all instrument tables.

This scenario may present itself specifically in neurosurgical cases, as experienced by Victor. An example is the use of the Mayfield neurosurgical craniotomy table, which is positioned over the patient. In most situations, with a right-handed surgeon, the table is brought in from the patient's right side. For Victor, the ideal setup was to bring the Mayfield table in from the patient's left side. This would also position Victor's scrub nurse on his left side. The issue was even more important when using the operating microscope, so Victor would not have to reach under the microscope to be handed an instrument. For anterior cervical spine surgical procedures, a right-handed surgeon would customarily stand on the patient's right, whereas Victor would stand on the left. In a 2-person practice, this had the effect of each surgeon leaving their "signature" by virtue of the laterality of the incision. For a posterior cervical spine decompression, with the patient in the prone position, or for decompressive lumbar laminectomies, a left-handed surgeon will normally stand on the patient's right side, and a right-handed surgeon will stand on the patient's left, to have the primary instruments (bone biting instruments, such as Kerrison punches) facing cranially, i.e., upward, toward the head. In this case, the positioning is dictated by the anatomy, i.e., the slope of the bone, rather than surgeon handedness. On the other hand, for unilateral lumbar disc procedures, the neurosurgeon usually stands on the side of the pathology, regardless of handedness.

Learning to Use the Nondominant Hand

Muscle memory certainly plays a role in many aspects of medicine: we have found that if we learned to do something in a certain way (regardless of side and handedness), it became our "norm." A prime example is endotracheal intubation: left-handed anesthesiologists tell us that a laryngoscope "has a handedness," but they all learn to hold it in their left hand and the endotracheal tube in their right hand. They are trained to do it one way, and one way only. The operating room setup is typically right-handed, including where the anesthesia machine is located: anesthesiologists adapt to this. For a left-handed anesthesiologist, a challenge does, however, arise when placing a right internal jugular intravenous line, as it requires positioning on the right side of the patient yet using the left hand for the procedure.

Ultrasonography, fluoroscopy, interventional procedures, and biopsies are all performed from the right side of the patient, and hence, left-handed radiologists may require adaptation or development of ambidextrous skills; endovascular catheterizations are taught from a right-handed perspective. Endoscopy scopes have dials located for right-handers; colonoscopies require clockwise rotation; thus, colonoscopes are designed to be held with the left hand on the control head while the right hand manipulates the scope. Bronchoscopes, on the other hand, are equally easy to use in either hand. Some in fact argue that bronchoscopy is more naturally designed for the left hander.

Concluding Remarks

In conclusion, we posit that handedness in medicine does matter—but should never dissuade students or residents from pursuing the specialty of their choice. Left-handed instruments and accommodations, including where the operating surgeon and other staff are positioned, are available and described in the literature. Patience from faculty, attendings, and staff alike may be required when faced with a left-handed student or resident for the first time. Accommodating a left-handed trainee or surgeon is almost always possible, and we urge trainees interested in a surgical or other "right-handed" specialty to not be deterred by their handedness.

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