

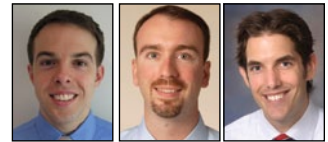
# Ergonomics and Retina

Proper seating and body positioning is imperative for any young retina doctor who hopes to have a long, comfortable career.

**BY MICHAEL DOLLIN, MD; WITH SUNIR J. GARG, MD; SONIA MEHTA, MD; AND MARC SPIRN, MD**

*Recently, I walked into our fellows' room after a long day in the OR. I had a crick in my neck and stiff shoulders. Another fellow stood against a wall, stretching. He said, "My back is killing me. Too many indirect lasers today." His back pains and my neck pains reminded me of the importance of ergonomics, an aspect of vitreoretinal training that fellows often overlook.*

*To all of my second year vitreoretinal colleagues, I say this: In the final weeks of retina training, you may feel comfortable performing multiple scleral depressed examinations, difficult indirect lasers in the clinic, and peeling a 2.5- $\mu$ m internal limiting membrane from the macula or diabetic membranes from a tractional detachment in the OR, but can you do it all without your back and neck hurting at the end of the day? Having spent the better part of 2 years becoming comfortable with the skills and equipment required for performing retinal surgery, the final few weeks of fellowship training are an opportunity to fine tune the details of exactly how we operate. We invited Sunir J. Garg, MD; Sonia Mehta; and Marc Spirn, MD, to share their thoughts on this matter.*



— Michael Dollin, MD; Christopher Brady, MD; and John D. Pitcher III, MD

## At what point in your career did you start paying attention to ergonomics?

**Sunir J. Garg, MD:** I spent a lot of time in the OR during my third year of residency. By the end of the day, both my back and neck would hurt. Cataract surgery had literally become a pain in the neck! A friend suggested that I take Iyengar yoga classes, because it puts a lot of emphasis on alignment and postural awareness. I did not initially want to take these classes. However, after just a few weeks, I noticed a dramatic improvement in my comfort in the OR. Part of this was due to increased strength and flexibility, but a significant part of it was due to my increased awareness of spine and body alignment. This training and awareness was critical during my fellowship when I was involved in more than 1000 cases.

**Marc Spirn, MD:** When I was a first-year resident, a senior resident stressed the importance of proper form while sitting at the slit-lamp. He taught me to sit upright with my neck in a neutral position, to adjust my seat and the slit-lamp at the beginning of the day, and not to change either of these regardless of the patient's height and body habitus. In other words, the only thing that moves is the patient's chair and chin rest, not the slit-lamp height or the physician's seat height.

**Sonia Mehta, MD:** I started paying attention to ergonomics during fellowship. Early in our fellowship, the senior

faculty stressed the importance of good ergonomic positioning so we could avoid musculoskeletal injuries. There are several studies on musculoskeletal injuries in ophthalmology, reporting incidence rates of 32% to 46% for neck pain<sup>1,2</sup> and 26% to 54% for lower back pain,<sup>1,3</sup> with performing indirect ophthalmoscopy and laser photocoagulation identified as risk factors. An astounding 15% of ophthalmologists had work limitations as a result of these injuries.<sup>1</sup>

## What is the most common ergonomic mistake you see retina fellows make?

**Dr. Garg:** In the OR, it is not aligning themselves properly with the microscope. Often I see fellows examine a patient on the stretcher without adjusting the patient's body. They move the microscope into position and contort their own body to make it fit to the setup. It is painful for me to watch, and a number of the fellows have told me that they have back and neck pain at the end of the day.

**Dr. Spirn:** The 2 most common ergonomic mistakes are bending over at the waist to perform indirect ophthalmoscopy and leaning forward into the operating microscope. Raising the patient to the appropriate height and positioning the patient properly before surgery can minimize both problems and prevent lower back strain.

**Dr. Mehta:** Retina fellows commonly make the mistake of bending the back and neck. When the neck or back is

flexed, it creates stress on the paraspinal muscles, ligaments, and tendons. It compresses the disks, which, with time and repetition, may lead to disk herniation, stenosis, and nerve impingement.

### What important changes have you made in the clinic to improve ergonomics?

**Dr. Garg:** The clinic is still a bit of a mess because we have less control over ergonomics there than in the OR. Slit-lamp tables are often poorly designed and are not ideal for either patient or doctor comfort. The new slit-lamp tables in our offices are 5 to 6 inches longer than they used to be. Using them to examine the patient requires a significant amount of hunching. Bending this way 60 times a day is backbreaking work. There really needs to be a greater emphasis among clinic device manufacturers around these issues. I think many of them use a gigantic person like LeBron James as a stand-in for the physician and design the instruments for someone that size.

To improve our seating, I would like a flat, no-slip seat that has an adjustable ring around the base, with low-profile casters that allow the wheels to slide under the footrest of the patient's chair.

I tend to stand up during injections. However, when I had a broken leg, I injected sitting down, and that worked quite well. I lean the patient back so that he or she is somewhat flat. I also have the patient move closer to the side that I am standing on so I do not have to lean over so much.

**Dr. Spirm:** I try, whenever possible, to move the patient rather than myself. Musculoskeletal injuries are more likely when repetitive motion occurs and during high stress activities when prolonged concentration is needed. During activities that require a lot of concentration, such as delivering focal laser or performing peripheral laser retinopexy, I try to relax my muscles and pay attention to my body position. The combination of tense muscles and poor body position can increase the probability of injury.

**Dr. Mehta:** The most important change I have made is to keep my neck and back in neutral positions. Retina doctors can do various things to achieve this. First, they should elevate the patient's chair to eliminate the need for bending the neck or back to see. For example, the traditional technique for scleral depression in the office is to recline the patient in a supine position. However, this forces the examiner to flex his or her neck. A more ergonomic method for doing scleral depression or indirect laser photocoagulation in the office is to elevate the patient's chair so the examiner is at eye level with the patient. The chair can be reclined to 45° and the patient's head tilted in various directions to see out to the ora with scleral depression.

### What important changes have you made in the OR to improve ergonomics?

**Dr. Garg:** The most important thing to do is to keep a straight spine, neutral head positioning, arms hanging somewhat passively at your side, and legs hanging down (as if sitting properly in a chair, not driving a car). As an exercise, I encourage fellows to sit in a chair and make themselves comfortable. They then bring the microscope into position and wheel the stretcher and the patient into position. This will set up a more stable platform.

A couple of practical tips that I think are helpful: First, I make sure that the patient's head is at the top of the bed or even hanging over the edge by half an inch. This allows the surgeon to sit up straight and avoid having to bend forward at the waist and tilt his or her neck backward in order to look through the scope. Second, I keep the oculars in a neutral position. All of us have different torso lengths, so for some people the oculars will be positioned at a 90° angle whereas other people will look down into the microscope.

**Dr. Spirm:** Positioning yourself and the patient is paramount. During vitrectomy, ophthalmologists should position the patient in such a way that the surgeon's back can remain straight and the neck can remain in a neutral position. The surgeon's chair should be set so that there is a comfortable knee bend (slightly less than 90°). I use wrist rests to stabilize my hands, and I position myself to operate with my arms in a flexed position (slightly greater than 90°). During scleral buckles, I raise the bed enough to minimize bending my waist.

**Dr. Mehta:** Many of the principles for good ergonomics in the clinic also apply in the OR. To keep the cervical spine and lumbar spine in a neutral position, fellows should elevate the OR table and adjust the microscope oculars so that the neck is not flexed. Fellows who perform scleral buckles should make sure the table height is adjusted so that they are not bending their backs and necks to operate.

### Do you have any closing ergonomic advice for retina fellows?

**Dr. Garg:** The earlier one starts paying attention to these issues, the better one will feel. Listen to your body: If you start getting aches and pains, try to figure out different ways to reduce them. Regular exercise is critical, but some postural alignment training with an occupational therapist or Iyengar yoga teacher goes a long way. The American Academy of Ophthalmology has set up a task force chaired by Jeffrey Marx, MD, that focuses on ergonomics. I encourage the Academy to continue

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developing this and to work more proactively with manufacturers to address some of these issues.

**Dr. Spirn:** As with most things in medicine, an ounce of prevention is worth more than a pound of cure. Fellows should consider yoga or Pilates to enhance core strength, prevent lower back injuries, maintain good posture, and prevent musculoskeletal injuries. As fellows get more comfortable in the OR, their muscles will relax, but, until that happens, they should remember to keep their muscles loose. Just as relaxing muscles helps athletes make a free throw or hit a tennis ball more accurately, so too will it allow fellows to operate more effectively and help keep them free of musculoskeletal problems.

**Dr. Mehta:** I encourage retina fellows to start with good ergonomic habits early to develop good technique, which will increase the longevity of their careers. ■

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