Ergonomics in Retina
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INTRODUCTION

If you have ever ended the workday with neck pain, a backache, or a tingling hand, you are not alone. In a survey of American Academy of Ophthalmology members, 51.8% of respondents reported experiencing symptoms affecting their neck, lower back, or upper body. Not only are ophthalmologists more prone to musculoskeletal disorders compared to physicians in other specialties, vitreoretinal specialists are particularly susceptible to these disorders due to the nature of the work we do. Repetitive, nonergonomic postures stress the muscles, tendons, ligaments, and joints. In fact, a survey of retina specialists showed that 85% of respondents were affected by neck or back pain. During the span of a career, these symptoms can lead to decreased productivity, permanent disability, and even forced retirement.

As is true with other diseases, the best way to approach occupational musculoskeletal disorders is with awareness and prevention. Many of us may not even realize that our daily activities are causing physical strain. In this article, we will discuss several ways vitreoretinal specialists can improve the ergonomics of their work environment.

THE OPERATING ROOM

Creating an ergonomically sound operating room (OR) starts with patient positioning. Remember to always adjust the patient to facilitate an optimal ergonomic posture for the surgeon, not the other way around. It is common for the patient’s head to be slightly flexed and too far down in the bed, causing the surgeon to lean forward. The patient’s head should be positioned at the top of the bed with the iris parallel to the ground (Figure 1). Adjust the bed to an appropriate height so that your neck and back are in a neutral position and your legs have sufficient room. The foot pedals should be moved so that your feet are flat on the floor, knees are bent at an angle close to or slightly greater than 90°, and hips are symmetrically elevated to avoid spinal twisting (Figure 2). Use of a wrist rest is a personal preference, but either way, the surgeon’s hands should always be supported to avoid unnecessary strain on the upper extremities. Exert the least amount of grasping or pinching tension necessary when handling instruments; the delicate micromovements performed during maneuvers like membrane peels are especially taxing on
Figure 1. Left: The head is flexed and too far down in the bed. Right: The head is near the head of the bed with iris parallel to the ground.

Figure 2. Left: The surgeon’s chair is too high and the pedals too far away, straining the back, hips, legs, and feet. Right: The surgeon’s hips are squared with knees bent at approximately 90° with feet securely planted on the pedals.
the entire upper body. Perhaps the greatest culprit for poor posturing in the OR involves the operating microscope. Newer heads-up viewing platforms (eg, NGENUITY 3D; Alcon, Fort Worth, TX; or the TRENION 3D HD; Zeiss, Jena, Germany) minimize this element of physical strain in the OR, but the majority of retina surgeons still use a traditional microscope. The scope position should be adjusted after you have set your bed and chair height. Adjust the angle of the oculars to avoid neck flexion or extension. Obtain a chair whose feet will allow you to maneuver very close to the patient’s head to prevent a kyphotic lean (Figure 3).

THE CLINIC

Even the busiest surgeons spend the majority of their time in the clinic, so it is imperative to be aware of ergonomics in this setting. Challenges with patient positioning in the slit-lamp resemble those in the OR. A common positioning error is to hunch over excessively, something usually caused by the patient’s footrest preventing the retina specialist’s chair from getting close enough to the patient. To address this, pull the slit-lamp closely toward you so that the patient is leaning forward (Figure 4). Instead of staying in one position, walk around the head of the patient while viewing the periphery to avoid craning or twisting of your neck and back. Make sure the patient’s chair height is elevated enough so that you do not need to bend over (Figure 5). Lastly, consider investing in a lighter indirect ophthalmoscope to minimize the weight on your neck and shoulders.

Figure 3. Left: The chair is too high and too far away from the bed, causing the surgeon to lean forward with shrugged shoulders and craned neck. Right: With the chair lowered (or microscope raised) and pulled close to the bed, the surgeon is able to maintain a straighter neck/back and relaxed shoulders.
Let's face it — a significant amount of our time at work is spent at a computer, and a lot of bad posturing habits happen here. Since many of us use the computer while interacting with patients, position your computer so that you are able to face the patient without twisting your neck or back (Figure 6). Make sure the height of your chair allows you to view the screen with your neck in a neutral position. Keep your shoulders pulled back and relaxed. Ensure that your wrists are supported while using your mouse or keyboard to avoid carpal tunnel syndrome (Figure 7). Purchase a comfortable and high-quality chair; some find it helpful to attach cushions that provide additional lumbar support. I recommend trying a standing desk, if feasible; I find that I have much less neck and back strain when I spend less time in a sitting position.

OUTSIDE THE OFFICE

Although everyone will experience occasional minor aches and pains, if you begin experiencing symptoms regularly, they should not be ignored. Since each body is unique, no single solution exists, but stretching/yoga exercises, massage therapy, anti-inflammatory medication, heat and ice application, and rest might help alleviate musculoskeletal disorder symptoms. Seek professional help if symptoms become more severe or chronic. Additionally, ergonomics deserve attention even outside of the workplace. Many retina specialists now spend hours in the car each week to travel to satellite offices. Driver's seat positioning, lumbar support, and steering wheel hand placement are increasingly becoming important elements of "workplace" ergonomics.

CONCLUSION

Because of the activities we perform as retina specialists, we must take special care to prevent injury. With the landscape of our field demanding that we see higher volumes than ever before, it is especially important to be cognizant of ergonomics in our daily practices. So, the next time you find yourself at the slit-lamp or surgical microscope, sit up straight and relax your shoulders — it just might prolong your career.
Figure 5. Left: The patient’s head is in a neutral position and the chair is too low, causing the physician to contort her back and neck in an unnatural way while viewing the temporal periphery of the patient’s right eye. Right: Raising the chair to an appropriate height and rotating the patient’s head 30° allows for a more ergonomic stance.

Figure 6. Left: The position of the computer relative to the patient is inducing a severe head turn, causing strain on the neck, back, and upper limbs. Right: Moving the computer and rotating the patient’s chair allows the provider to face the patient more comfortably.

Figure 7. Left: Using a wrist rest while typing on a keyboard (left) or maneuvering a mouse (right) may help prevent injuries such as carpal tunnel syndrome.
REFERENCES


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