

Seven Risk Factors for Injury, and Seven Solutions: Ergonomics, Part Two

BY LINDA ROACH, CONTRIBUTING WRITER

San Francisco vitreoretinal surgeon Wayne E. Fung, MD, likes to point out that the heaviest object Eye M.D.s lift during surgery might weigh all of 500 g—not enough to put them at risk for the kind of sudden musculoskeletal disorder (MSD) that first comes to mind when one thinks about occupational injuries in medicine. But, quietly, doctors are suffering (see last month's Practice Perfect, "Is the Job You Love a Pain in the Neck?").

Jeffrey L. Marx, MD, a Burlington, Mass., vitreoretinal surgeon who surveyed ophthalmic surgeons about work-related pain in 2001, said he fears that the problem will be even worse in the future. "With increasing demand on ophthalmologists, these problems will manifest themselves at earlier ages," said Dr. Marx. "Young ophthalmologists need to know that bad habits will catch up with them, but careful attention early on will make an enormous difference to their lives."

Find time to stretch. Dr. Fung became interested in the topic of back pain among ophthalmologists about 25 years ago, when he suffered a pain-

ful back spasm after a series of lengthy vitreoretinal surgeries. "Consider that a microsurgeon's eyes must be fixed on the eyepieces of the microscope, the hands are controlling the instruments, and the feet are operating the pedals, which control the microscope and the surgical console," he said. "What stabilizes all three points? The back, shoulder and neck muscles," Dr. Fung said. He urges physicians to perform stretching exercises during "micro breaks" between patients and to strengthen the body's core (abdominal) muscles, which support the spine.

Know the risk factors. Work-related MSDs have a multifactorial nature and variable presentation, which means it might not be obvious which combination of possible solutions will halt, or prevent, the pain cycle for an individual Eye M.D. The first step is to be aware of the key risk factors.

Avoid Neck Injuries

1. Risk factor—the slit lamp: In other occupations, especially those involving data entry, neck pain is caused by improper posture and/or improperly adjusted equipment. The head, neck and torso should be aligned vertically in a neutral posture, without the neck pushed forward or the head tilted down or up to view the monitor. In the ophthalmologist's office, slit lamps commonly are positioned on the exam table in such a way that the ophthal-

Neck and Limb Stretches

Neck. 1) Put chin to chest, and let gravity stretch the back of your neck. 2) Hold for a count of four. 3) Return head slowly to center. 4) Repeat movement to right, then back. 5) Then left. (Return head slowly to center each time. Do not roll your neck.)

Shoulder. 1) Place right hand over your left shoulder, as far down your back as possible. 2) Place your left hand on your right elbow and push backward. 3) Switch arms and repeat.

Upper arm. 1) Without bending the elbow, hold your right arm across your chest toward your left side. 2) With the inside of your left elbow or your left hand, push your right arm back toward your body. You'll feel the stretch in your right upper arm and shoulder. 3) Switch arms and repeat.

Wrist. 1) Hold arm straight out in front of you. 2) Pull the hand backward with the other hand, then pull downward. 3) Hold for 20 seconds, then relax. Repeat three times.

mologist must lean toward the instrument, pushing the neck out of alignment and into extension repeatedly.

Solution: Modify the table to move the slit lamp closer to the examiner than to the patient, said Martin Wand, MD, a Farmington, Conn., ophthal-

Stretches for the Lower Back

The pelvic tilt. Striated muscle relaxes when gently stretched, and the pelvic tilt is the best at accomplishing this in the lower back, noted Dr. Fung. He suggested lying on a bench in the surgeon's dressing room. 1) Lie on back, arms at side, knees bent and heels on the bench. 2) Squeeze anal sphincter and contract glutei. 3) Slowly "suck in" the anterior abdominals while flattening the back's arch. 4) Exhale to flatten it further. 5) Hold for 10 to 20 seconds, and then slowly relax. Repeat three to six times. (This also can be done in a standing position.)

Knee(s) to chest. 1) Lie on back, arms at side, knees bent and heels on the bench. 2) Slowly raise knee(s) to chest, using arms to help if needed. 3) Count to five. 4) Lower legs slowly, one at a time, and rest briefly. Repeat five times.

Single or double leg raise. This exercise strengthens your core without stressing your lower back. 1) Lie on back with both legs out straight, hands at side with palms down. 2) Slowly raise one or both legs off the floor six to eight inches, then lower. Do this three times. As your muscles strengthen, increase difficulty by placing hands behind head, raising legs only two to three inches, holding leg(s) up for a count of five or 10, and raising head two to three inches simultaneously with leg(s).

mologist who suffered a prolapsed spinal disc that he attributes to awkward postures during surgery. "The patient will be a little uncomfortable for two minutes, once a year, instead of the physician being in that awkward position many times every day," he said.

2. Risk factor—the biomicroscope: Operating biomicroscopes are not always equipped with eyepieces that can be tilted for comfort. Even if seating and table heights can be adjusted optimally, the stationary eyepiece forces the neck into awkward flexion or extension for the duration of the surgery. Nurses and technicians who assist during surgery also are at risk. (Eventually, the awkward posture also can damage the lower back, said Dr. Wand.)

Solution: Although an adjustable eyepiece may cost more than \$1,000, this modification can prevent neck pain and reduce the risk of more serious spinal complications later.

3. Risk factor—the computer: The neck and shoulders can become strained when the head is tilted back to view a monitor (e.g., with bifocal eyeglasses) or if the arm is lifted away from your body to reach the mouse.

Solution: Do not wear bifocals that require extension of the neck to read through the lower segment. Instead get a bifocal where the upper segment is focused at the computer distance and

the lower segment focused for the closer work on your desk. Place the mouse so that there is no need to lift your arm to reach it.

Avoid Back Injuries

4. Risk factor—improperly adjusted equipment in the OR: Surgeons sometimes neglect to adjust the chair and table to the proper height, Dr. Fung said. The higher the seat, the more the back muscles must work. During a series of surgeries, prolonged maintenance of the body in an awkward position further magnifies the strain on the spinal muscles and tendons. This leads to overfatigued tissues, discomfort and inflammation. A painful and debilitating back spasm could occur at any time.

Solution: Do not commence surgery without first adjusting the seating, the table and the equipment so that you can maintain a neutral spine, with normal curvature, throughout the procedure. If you experience muscle fatigue symptoms (dull ache, tightness, stiffness, "knot" formation or pressure), stretch the muscles to relax them. The best all-around stretch for the lower back is the pelvic tilt.

5. Risk factor—the pedal: Seated surgeons increase their risk of injury if they cannot reach the foot pedal without angling the thighs toward

the floor. This makes it harder for the musculature to stabilize the spine.

Solution: If possible, lower the seat and table so that you can keep knees bent at 90 degrees, feet flat on the floor and thighs parallel to the floor. This is the least stressful position for the lower back, according to Dr. Fung. If you cannot use the foot pedal without inclining the thighs, elevate the pedal(s) by putting it (or them) on a sturdy rise.

Avoid Arm and Hand Injuries

6. Risk factor—use of the keyboard:

With the spread of electronic health records, physicians might be spending more time typing on a computer keyboard. In addition to the risks from repetitive use of the keyboard, certain tasks require the exertion of concentrated force, during which hand and arm muscles must work continually (e.g., when the mouse is so sensitive that the pointer is hard to control).

Solution: With every new terminal you encounter, adjust the chair, table, monitor, keyboard and mouse to provide the best posture with the least amount of muscle strain. You also can modify the sensitivity of your mouse.

7. Risk factor—contact stress:

Contact stress can cause tingling and numbness if a tendon, nerve or blood vessel is stretched over a bone or tendon. Tendons can be damaged when repeated finger motions are performed with a bent wrist. The external version of this occurs when the forearms or wrists/palms come into contact with sharp edges on a table or wrist rest.

Solution: Do not lean forearms or elbows on unpadded surfaces. Keep palms, wrists and forearms in a straight line, roughly parallel to the floor. Watch for sharp edges on accessories like wrist rests.

TLC for the Back



Buy a ticket. Attend Dr. Fung's Instruction Course, TLC for the Microsurgeon's Back (Sunday, Oct. 25, from 9 to 10 a.m., event code "370").