

Repetitive Stress Injury: The Upper Trapezius

Whether your clients are sports participants, musicians or simply casual computer users, they may suffer from this common condition.

Repetitive stress injuries (RSIs)—sometimes referred to as “repetitive strain injuries”—are a group of conditions usually caused by placing too much stress or strain on a joint or musculoskeletal tissue. RSIs are often associated with performing recurring motions, whether on a computer, on the telephone or in a sports activity such as tennis or squash. RSIs may even occur in children if they spend multiple hours on the computer or play video games and/or musical instruments for long stretches of time.

RSIs can include a range of injuries—from upper-trapezius strain, carpal tunnel syndrome, tendonitis and postural dysfunction to lumbar-spine sprains and herniated disks (Anderson 1997). Depending on the way an overuse injury presents itself, it may be managed by one of a list of healthcare professionals, including primary-care physicians, neurologists, pain specialists, orthopedists, or physical and occupational therapists. For example, a patient who suffers from a neck or upper-extremity injury and subsequently has a loss of sensation in the hand will likely be treated by a neurologist. A patient who has elbow tendinitis due to repetitive stress may be cared for by an orthopedist or a primary-care physician.

This column will focus on a common RSI, upper-trapezius strain.

ANATOMY REVIEW

The trapezius is a large muscle broken down into upper, middle and lower fibers. The upper trapezius originates at the skull and the ligamentum nuchae (posterior neck ligaments) and inserts on the clavicle. This muscle acts to elevate the

scapula and to extend, rotate and side-bend the neck.

CAUSES OF INJURY

How often do you hear clients complain of “knots” or “tightness” in their upper traps? An upper-trapezius strain can be triggered quite easily by consistently overusing the muscle group, even at a low intensity. Because repetitive motions do not allow the affected tissue to rest between movements, they can cause stress and irritation.

The members of today’s work force don’t often get up to sharpen a pencil, fax documents or walk to the post office to deliver a package. The easy and convenient access of working tools promotes inactivity and therefore a rise in RSIs associated with desk and computer work. Simple, everyday movements—like habitually holding a telephone between the ear and shoulder—can trigger palpable tightness and tenderness in the upper traps.

Carl Gustafson, RPT, CSCS, a licensed athletic trainer with more than 20 years’ experience in sports medicine and conditioning, explains that no matter what shape someone is in, muscles that are in a stagnant position all day can go into spasm. Spasms don’t necessarily occur just because a muscle is too tight or too weak; they can also occur simply from lack of movement. The fittest athlete at your gym may suffer from this malady.

A primary tool for preventing or treating RSIs is exercise. By correcting the postural dysfunctions and muscle imbalances that promote these conditions, personal trainers and group exercise instructors can have a significant effect on people who suffer from RSIs.

GENERAL GUIDELINES

Of course, a client cannot reverse the harmful effects of a sedentary job by spending 1 or 2 hours at the gym after sitting for 8–10 hours with little or no

movement. You can greatly influence your clients’ behavior outside the gym—and therefore their susceptibility to RSIs—by educating them on proper posture and ergonomics in all their daily activities. For example, we know that, when lifting, there is an optimal joint angle that provides the greatest mechanical advantage. If you are holding a gallon of milk in your hand with your elbow extended and arm in abduction, there is an optimal angle at which to bend your elbow. Your biceps muscle is most effective at carrying the milk with a shorter-lever arm. If your elbow remains extended (and the biceps is lengthened), it is difficult to hold the gallon container. This muscle “lengthening” causes what is called **passive insufficiency**. The opposite situation, when the muscles are shortened beyond their optimal length, is called **active insufficiency**.

It is easy to understand how the upper trapezius could be in a state of active insufficiency in certain situations; for example, when the shoulder is elevated and the neck is extended, side-bent and rotated, as when you are cradling a phone between your ear and shoulder. Throughout the day, the upper trapezius might be actively insufficient, while, alternatively, the rhomboids might be passively insufficient (when the shoulders are rounded).

red flags

Refer your clients back to a physician if they experience any of the following symptoms:

- numbness, tingling or any radiating symptoms in the upper extremity
- loss of strength in the upper extremity (possibly indicating a nerve injury)
- increased pain or loss of sensation in the arms with head or neck movement

Developing better posture and moving out of these positions intermittently throughout the workday will place the muscles back at their optimal length while promoting blood flow and oxygen delivery to the muscles. Gustafson recommends that clients initiate mobilizing movements at high repetitions throughout the workday.

EXERCISES AT THE OFFICE

Sitting with upright posture, perform 15–20 reps an hour of the following exercises.

- 1. Scapular Pinches.** Roll the shoulders back, and pinch the shoulder blades together.
- 2. Shoulder Shrugs.** Raise the shoulders up toward the ears, then lower them back down.
- 3. Neck Side-Bending.** Tilt one ear toward the shoulder, and hold briefly. Repeat on the opposite side.
- 4. Neck Rotation.** Look over one shoulder, and pause briefly. Repeat on the opposite side.

A client who complains of tightness or soreness in the upper trapezius after the above movement-oriented exercises should perform 1–3 reps of the following static stretch, holding each rep for 30 seconds.

- 5. Neck Side-Bending/Rotation Stretch.**
 - In a standing or seated position, place the right hand on top of the head and let the left arm rest at the side.
 - Gently pull the head toward the right shoulder with the right hand.
 - Rotate the head down and look at the right hip. (The stretch should be felt on the left side of the neck/shoulder area.)
 - Repeat on the opposite side.

If your client has a forward shoulder posture, the condition can be improved by the scapular pinch and by a pectorals stretch.

EXERCISES AT THE GYM Strengthening

Gustafson reports that many fitness professionals eliminate shoulder shrugs from a client's routine, assuming that a tight upper trapezius indicates a strong upper trapezius. In reality, tight upper-trapezius muscles are usually due to repetitive or positional strain, not strength.

Strengthening the middle and lower trapezius, along with other scapular retractors and depressors (rhomboids

and latissimus dorsi, among others), will also help one's posture throughout the workday. Perform 3 sets of 10–15 reps of the following exercises.

1. Prone Horizontal Abduction.

- Lie prone on a bench with shoulders hanging down off the bench at the sides.
- With palms facing down, raise the arms up toward the ceiling into horizontal abduction until the arms are parallel to the floor.
- Use 0- to 5-pound weights as tolerated.

2. Prone Shoulder Flexion, or "Ys."

- Lie prone on a bench with arms hanging down at the sides.
- With thumbs pointing upward, raise the arms up into shoulder flexion while retracting and depressing the shoulder blades.
- Use 0- to 5-pound weights as tolerated.

3. Seated Rows. Use an overhand grip (palms facing down) while performing scapular retraction on a seated row machine.

4. Lat Pull-Downs. Using a lat pull-down machine, pull the bar down toward the chest. (With a client who suffers from a neck injury, use a narrow, underhand grip to avoid discomfort.)

Cardiovascular Exercise

To promote endurance in the postural muscles, a client may derive benefit from an upper-body ergometer (UBE) as a cardiovascular modality. Rowing machines, if used with correct form, may also improve the aerobic capacity of these muscle groups.

EDUCATION IS THE KEY

The most powerful tool you can use with clients who suffer from RSIs is education. Demystifying some of the confusion about the causes of upper-trapezius strains will help your clients immensely. Incorporating movement techniques with static stretching will encourage blood to circulate through the stagnant muscles overused in a desk environment. This change alone will alleviate some of the tension in the upper trapezius. Combining these techniques with strengthening exercises and endurance for the scapular retractors and depressors will do your clients a great service.

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instructor at Sports and PT Associates in Boston. She has choreographed and been featured in a number of DVDs, including Fit to Flawless: The Body Transformation System, and has spoken nationally on fitness and injury. Logan is the Pilates conditioning coach for Boston University's tennis team. She can be reached at Catherine@Fittoflawless.com.

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Reference

Anderson, B. 1997. *Stretching at Your Computer or Desk*. Bolinas, CA: Shelter Publications Inc.; www.exrx.net.