

Preventing Repetitive Stress Injuries

By Amanda Carpenter, PT, DPT, CProT, CEAS

The routine job tasks of a production arborist require intense physical demands for prolonged periods of time, increasing susceptibility to a repetitive stress injury or musculoskeletal disorder. Maintaining optimal health and fitness can make an arborist more productive and efficient, while also decreasing the risk of a repetitive stress injury. By addressing key lifestyle factors and adding in specific, focused exercises, arborists can reduce the risk of suffering a musculoskeletal injury.

Ergonomics is the study of a person's work, and how it relates to the tools and machines used to complete the work. It involves improving tools and altering tasks to make the worker more efficient, while also reducing the risk of a musculoskeletal injury. Ergonomic risk factors include: repetitive movements, forceful exertions, vibration, awkward postures, and contact stresses. Arborists are at a high risk for an ergonomic-related injury because of their routine exposure to these risk factors. A work-related musculoskeletal disorder is an injury of the muscles, tendons, ligaments, nerves, joints, cartilage, bones, or blood vessels.

Symptoms can include pain, stiffness, swelling, numbness, and/or tingling. Ergonomic-related injuries are musculoskeletal disorders or repetitive stress injuries that involve soft tissue disorders of the tendons, muscles, ligaments, and nerves.

Injuries to the shoulder and back are common to the green industry because of repetitive reaching and bending. These include shoulder impingement or rotator cuff injuries, and low back strains or herniated disc injuries. Repetitive reaching tasks place significant stress on the shoulder complex; these tasks include ascent techniques, working with pole tools, advancing the climbing line, loading wood, feeding the chipper, pulling rope, and raking. Injuries to the low back can occur from repetitive lifting and bending, wood handling, feeding the chipper, working from an aerial lift, work-site cleanup, and saw sharpening. Increased use of aerial lifts increases over-reaching as well as bending and leaning from the bucket, due to the limited mobility of the basket in the canopy.

Musculoskeletal disorders and repetitive strain injuries can be prevented through the routine use of good posture and body mechanics, as well as the performance of stretches and exercises focusing on key areas of the body.

Keys to Preventing Musculoskeletal Injuries

Posture and Body Mechanics

Practicing good posture and body mechanics are key factors in preventing musculoskeletal disorders. One can practice good posture when driving (or riding as a passenger), when walking across job sites, or when sitting during a break. Proper body mechanics can be performed during dynamic work tasks and positioning.

Use of the abdominal muscles and scapular stabilizing muscles are the keys to proper posture and good body mechanics. To properly use your abdominal muscles, you want to focus on the muscles below your bellybutton. Draw these muscles in as you would react to being hit in the stomach; be sure to breathe. To protect your low back from strain and injury, tighten your abdominal muscles throughout the day while driving, lifting, bending, and standing.

Proper use of the abdominal muscles will improve balance when limb-walking and during work-positioning.



Crunches with a focus on the lower abdominal muscles. Lie down on the floor with your hands behind your head to support your neck (or using a towel to cradle your head to avoid pulling on your neck). Keeping your eyes focused 10 degrees behind your direct line-of-sight, raise your head and shoulders from the floor until you feel a stabilizing shake in your abdominal muscles (as shown here); hold for two seconds. Do not curl your head up, and make sure your lower back does not lift off the floor. Repeat until your abdominals are fatigued, working toward a long-term goal of 200 total repetitions per day.

The muscles between your shoulder blades are another key component of good posture and body mechanics. The scapular muscles stabilize the shoulder complex, similar to how the outriggers stabilize a bucket truck.



The strength of the core muscles will improve simply by your remembering to engage them throughout the day; however, crunches can also be performed to improve the strength and stability of the core.

The muscles between your shoulder blades are another key component of good posture and body mechanics. These muscles are similar to the outriggers on a bucket truck in that they stabilize the shoulder and upper extremity complex, similar to how the outriggers of a bucket truck stabilize the truck for safe bucket use.

To exercise, contract these muscles by gently squeezing the shoulder blades together; be cautious to avoid scrunching your shoulders up to your ears when you squeeze. Try this: slouch in your chair and then reach up. Do you felt pain, pressure, or a pinch in the top of your shoulder? If so, you are pinching the soft tissues in the shoulder. This is called shoulder impingement, and can lead to a rotator cuff tear. Now, sit up nice and tall and position your shoulder blades back and down; raise your arms again. The pinch should be gone or less.

When reaching way out to a limb or reaching from the aerial lift, if you feel this pinch, you are damaging your shoulder. And although one can get away with doing this movement several times, eventually, the rotator cuff is going to get inflamed and develop a micro tear. When performing tasks, if you experience any discomfort in your shoulders or low back, reposition yourself by engaging the abdominal muscles and squeezing the shoulder blades together, which will reduce stress on the body. If this does not eliminate your discomfort, seek the advice of a medical professional before you experience a debilitating musculoskeletal injury.

Supportive Stretching and Strengthening

Based on the routine physical tasks of arborists, and my clinical experience in working with arborists, I can make general recommendations for stretching and strengthening

The advertisement features a black leather climber pad with a neon green mesh lining, shown against a background of a tree trunk. The text reads: "YOUR SHINS WILL THANK YOU", "CLIMBER PADS WITH PROCOOL™ TECHNOLOGY", "Neon green ProCool™ mesh lining adds breathable, non-slip comfort to this durable black leather design. Superior leg support with large surface area provides even pressure distribution for a perfect fit.", and "WEAVER ARBORIST THE ULTIMATE CLIMBING EXPERIENCE™ www.weaverarborist.com". A small logo in the top right corner says "Visit our booth #700".



Bridging. Lie on your back with your knees bent. Put your feet flat on the floor, about waist distance apart, and position your arms at your sides. Tighten your deep lower abdominal muscles. Squeeze your buttock muscles and lift your hips off of the floor, while keeping your abs tight. Do not allow your lower back to arch or sag.

If you get a cramp in the back of the thigh, lift your toes off the ground and concentrate on tightening your buttocks more. Repeat until your buttock muscles fatigue. Do two to three sets to fatigue, three to four times per week. If you experience low back pain, focus on keeping your abs tight. If pain continues, discontinue the exercise and consult a physical therapist or spinal specialist.



Posterior shoulder capsule stretch. Lying on your side, bend your bottom arm to 90 degrees. With your other arm, apply a gentle downward pressure until you feel a stretch in the back of your shoulder/arm. Hold the stretch for 90 seconds, and then repeat on the other side. Make sure not to let your body roll forward during the stretch. If you feel any shoulder pain during the stretch, discontinue and consult with a medical professional.

for most arborists. However, a *personalized* stretching and strengthening program is necessary for those who have injuries or painful symptoms.

As previously mentioned, crunches can be performed to strengthen the core. Pay close attention to the instructions, as there is a modification to the traditional crunch to ensure use of the lower abdominal muscles. Bridging is another good exercise that focuses on the core, as well as the gluteal muscles that oppose the hip flexors (which are used to lift the hips during ascent). Flexibility of the hips is important in reducing strain on the low back.

Remember the hip rotation stretches shown in the October 2016 issue of *Arborist News* (p. 72)? Try this hip stretch to see if you feel tightness in your hips. Your hip flexibility should be symmetrical. However, due to climbing-leg dominance, one hip is often tighter.

To improve stability of the shoulder complex and reduce the stress associated with your daily work tasks, strengthen the scapular stabilizers and rotator-cuff muscles. There are a variety of exercises that can be performed using small free weights or elastic bands; pay close attention to the balance of the internal and external rotator-cuff muscles. The posterior shoulder capsule is often tight in the body of a working arborist. To see if your posterior capsule is tight, try a posterior shoulder capsule stretch. If you are able to reach the floor by bending the wrist and fingers down, then you are not tight in the posterior shoulder capsule and do not need to perform this stretch.

The prevention of work-related injuries is both the responsibility of the employer and the employee. It is the employer's responsibility to provide a safe work environment, while it is the employee's responsibility to engage in safe work practices and maintain good health. Arborists can reduce their risk of a work-related injury by taking the time to plan their tasks, avoiding repetitive movements, practicing good posture and body mechanics, and focusing on stretching and exercises that support the body when working. Remember, the most valuable piece of equipment you use every day is your body, taking the time to care for it is a necessary investment.

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Photos courtesy of the author.

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