

Improving Climber Flexibility

By Amanda Carpenter, PT, DPT, CProT, CEAS

The following is one of the most frequent questions I am asked about injury prevention in the world of arboriculture is, "What stretches should I do?"

I am always hesitant to provide a list of stretches because I believe a stretching program should be individualized to address flexibility-limiting biomechanical deficits. In addition, if stretches are not performed properly and when necessary, they can cause more harm than good. This article will provide a background on flexibility and factors that can affect it.

Guidelines for Stretching

- ✓ Do not bounce; hold the stretch statically without movement
- ✓ Breathe comfortably; exhalation relaxes the muscle
- ✓ Hold isolated muscle stretches for 30 seconds
- ✓ Repeat each isolated stretch 2x–4x to improve mobility
- ✓ Avoid stretching to the point of pain
- ✓ Avoid stretching if there is excessive or unstable range of motion

These are general recommendations for stretching. A *personalized* program is best for preventing injury and is necessary for those with injuries or painful symptoms.

Flexibility

Flexibility is the ability to move through a range of motion; the greater the flexibility, the greater the range of motion. Decreased flexibility involves tightness of tissues, which can occur as a result of adaptive shortening of muscles due to repetitive postures, loss of joint mobility, neurologic changes, or scar tissue adhesions.

Flexibility does not only involve stretching muscles. A variety of factors affect one's flexibility, such as muscle tension, neurologic input, scar tissue, hydration, and stress level. Stretching done to improve flexibility involves elongation of the soft tissues in the body (these include

muscles, tendons, fascia, and nerves). It is performed to elongate the soft tissues and improve range of motion. Various stretching techniques include static, dynamic, passive, and active stretching, as well as practices, such as yoga, which focus on improving flexibility.

It's Not Just About the Muscles

Fascia is a specialized system of the body. Similar in appearance to a spider web, it is a continuous soft-tissue network that extends from the top of your head to the tips of your toes, penetrating every muscle, bone, nerve, blood vessel, and internal organ. It plays an important role in the support and structure of the body. Fascia is the white connective tissue observed in a piece of raw meat, the tiny fibers holding everything together. (Those who have skinned a deer, or other animal, know what fascia is and how powerful it can be.)

Injury, trauma, inflammatory responses, and/or surgical scarring can create myofascial restrictions that can produce tensile pressures of approximately 2,000 pounds per square inch. It is difficult to stretch these restrictions, which can often only be released with manual therapy techniques and tools. Self-massage and release tools can be used to address myofascial restrictions and assist in improving soft-tissue mobility and flexibility. These tools include massage rollers, cane-type release tools, self-release balls, and foam rollers, just to name a few. A manual therapist can instruct individuals in the use of self-release tools and techniques to improve the flexibility and biomechanics, thus reducing the risk of a musculoskeletal injury.

Flexibility can be affected by dehydration, age, injury, and stress.

Proper Hydration is Necessary

The body is made up of a significant amount of water. Dehydration causes soft tissues to shrivel and harden. Think of a dry, used sponge. When dehydrated, the soft tissues do not stretch effectively. Proper hydration is necessary for adequate soft-tissue mobility needed for flexibility. One rule of thumb is that 50 percent of your body weight, in pounds, is a good estimate of the minimum number of ounces of water needed daily. For example, a 160-pound person needs 80 fluid ounces of water per day.

Replace Electrolytes

Electrolytes lost due to sweating during intense or prolonged physical exertion, especially during hot weather, can lead to muscle cramping. Unrefined salt, such as sea salt or Himalayan salt, is a good way to replace minerals, and can be added to water or food.

Other Important Factors in Flexibility

Flexibility decreases with age. However, it can improve with healthy habits and a good fitness routine. Scar tissue from an injury is not as mobile as the original tissue and can interfere with flexibility. A professional in manual therapy or bodywork can be consulted to address scar tissue adhesions, as through the use of soft-tissue and joint mobilizations. Increased muscle tension is a result of physical and emotional stress, and will reduce flexibility as well as cause pain. Relaxation techniques, such as meditation, relaxation breathing, or even rocking in a rocking chair, can help. Epson salt baths also promote muscle relaxation.

Flexibility and Complex Motions

Think of the crazy range of complex motions you perform daily: ascending the tree using body thrusts or ascenders, rotating your body while limb walking, or balancing at two tie-in positions as you un-weight an over-extending scaffold limb and make a cut with a chain saw to remove a large branch from the underside of the scaffold. All of these require a widely varying complexity of joint motions from the neck to the toes. During these activities, the body will move where it has mobility (and not where it is tight, or where there is a restriction in the soft tissues or joint mobility).

It is difficult if not impossible to determine, on your own, which tissues and joints are moving and which are not. Regardless, ignored or left unresolved, localized joint mobility issues can result in increasing pain and long-term injury. Proper diagnosis requires the insight of a professional who is trained in human biomechanics. Joint mobility profiles are unique to each individual.

Stretching for the Arborist

Based on the routine physical tasks performed by today's working arborists, and my clinical experience with arborists, I can make general recommendations for stretching. However, *a personalized program is best for preventing injury* and is necessary for those with injuries or painful symptoms. Stretching should be avoided if there is excessive or unstable range of motion or a recent injury.

One area of limited flexibility for many arborists is the hip. Flexibility of the hips is important to reduce strain on the low back and knees. Of particular note are the hip rotators and hip flexors, which are used during ascent. Climbers generally have asymmetry in their hip mobility. A stretching program or routine should strive to establish symmetry, which may require twice as much stretching on the tighter side.



Tools of Self-Massage and Release

Self-massage and release tools can be used to address myofascial restrictions and assist in improving soft tissue mobility and flexibility. Tools may include massage rollers, cane-type release tools, self-release balls, and foam rollers.



Hip Flexor Stretch

Kneeling with one knee in front of the other, slowly tilt your pelvis by tightening the buttocks and dropping your tailbone until a stretch is felt in the front of the hip.

This stretch can also be done while standing. With one foot in front of the other, gently rotate your pelvis to flatten your back (i.e., imagine tucking your tail between your legs) until you feel a stretch in the front of the hip of the back leg. Hips and shoulders face forward; do not arch your back.

Whether kneeling or standing, hold for 30 seconds, then repeat on opposite side. You should *not* feel this stretch in your back. If you experience any pain, avoid this stretch and consult a medical professional.



Hip Rotation Stretches

Sitting up straight, position one ankle over opposite knee (as shown). You may feel the stretch anywhere around the hip, groin, or buttock of the hip that is rotated. If you do not feel a stretch, gently push your knee down until a mild stretch is felt. Hold the stretch for 30 seconds, and then lean forward over your hip to feel a greater stretch in the buttock. Again, hold for 30 seconds. Repeat stretch on opposite side.

If you find one hip is tighter than the other, spend a greater amount of time stretching on that side. Make sure to keep your back straight. If you experience lower back pain, tighten your abdominals when doing this stretch. If pain continues, avoid the stretch and consult a medical professional.



Conclusion

Before engaging in a stretching routine, consult a professional in human biomechanics to assess for areas of limited mobility. You may not be able to address your limitations through routine stretching alone.

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Photos courtesy of the author.

For additional information on stretching and strengthening for the practicing arborist, keep an eye out for "Preventing Repetitive Stress Injuries," in an upcoming issue of Arborist News.

Plant I.D.



VERN WILKINS, INDIANA UNIVERSITY, BUGWOOD.ORG

Did you correctly identify this plant from page 20?

Quercus phellos

This member of the red oak group is commonly found in wet bottomlands throughout its native range, but adapts well to most urban conditions. Low maintenance, fast growth, and a classic oak crown shape make the willow oak a good choice for residential and park settings, as well as for planting as street trees.

Botanical Name: *Quercus phellos*

Common Names: Willow oak

Mature Size: 40–75 feet (12–23 m) high,
25–50 feet (8–15 m) wide

Foliage: Light-green, entire margin, narrow
(1 inch; 2.5 cm wide) leaves;
visually similar to willow (*Salix*);
undistinguished autumn color

Growth Rate: Fast

Fruit: Round half-inch (1.27 cm)
acorns with caps that cover
about one-quarter of the acorn

Geographic Range: Native to the southern and
southeastern regions of the U.S.

USDA Hardiness

Zones: 5–9

Pests and Diseases: Susceptible to diseases and pests
of oaks, including oak wilt,
chestnut blight, anthracnose,
scales, borers, and leaf miners