

SPECIAL SERIES: WHAT ACHES? COMMON AILMENTS AFFECTING THE WOODTURNER

Neck Pain

Rich Foa

There probably isn't a single woodturner who hasn't been bothered at some time by neck pain. Mostly, this takes the form of a stiff neck or "crick." Typically worse on one side, it might last anywhere from several hours to several days, benefiting from the application of heat or ice, over-the-counter pain medication, and mechanically supporting the neck. Muscle tenderness makes massage and stretching difficult. The most common explanation is having "slept wrong," although among woodturners, too much time spent peering into the bottom of a bowl while turning must be a close second. And while stiff necks are painful when we have them, and a recurrent problem for some, it may be of some relief to learn that such pain is entirely muscular and does not have long-term consequences.

Neck pain, however, can be due to more serious problems that can impair strength and coordination in one or both upper extremities, feeling in the arms and hands, and balance—with obvious and significant effects on our ability to turn. Some of these more serious conditions can require urgent medical attention and aggressive or protracted treatment. Our necks are, of course, vulnerable to acute trauma in auto accidents, sports activity, and falls. More often, however, the problems that produce chronic pain and that can produce nerve injury result from slowly evolving degenerative processes. They tend to start with intermittent symptoms and progress gradually. Things to watch for are sharp pain that radiates from the neck into an arm, localized weakness, and loss of feeling. In the most serious but fortunately rarer situations, there

can also be stiffness and weakness of lower extremities, loss of balance, and impaired bladder function.

The cervical spine

The spine in the neck (cervical spine) is constructed in much the same way as the spine in our low back (lumbar spine), and vulnerable to the same degenerative processes and injuries—with some important differences. It consists of a stack of seven more or less cylindrical vertebral bodies with cartilaginous disks in between (*Figure 1*). The uppermost vertebra directly supports the head and, in a reference to Greek mythology, is called the atlas. Cervical disks, like lumbar disks, act as shock absorbers and allow for neck motion. Behind each of the vertebral bodies is a bony arch that creates a closed canal housing the spinal cord.

The spinal cord itself is a densely packed and highly organized bundle of nerves carrying virtually all the signals in both directions between the brain and the body. Only the information gathered by the "special" sensory organs of the head (sight, hearing, inner ear balance, taste, and smell) and movement of the face and tongue are not transmitted through the spinal cord.

As with the lumbar spine, the vertebrae in the cervical spine are held tightly in place through a dense network of ligaments. And they are both supported and moved by a complex set of muscles that produce flexion, extension, rotation, and tilt—in other words, three-dimensional movement. On either side of each cervical disk is a bony window called a neural foramen. Through these pass the nerve roots that extend to our neck muscles and arms, control movement,

and carry sensory information back to the brain. The sensory information conveyed is tactile (touch, temperature, vibration), proprioceptive (position), and pain. The distribution of both the motor nerve fibers and the sensory nerve fibers in cervical roots is highly organized and remarkably uniform from one person to the next, enabling accurate mapping of an injury based on the pattern of weakness or sensory loss that results. For example, an injury to the nerve root at the fifth cervical level (C5) will produce shoulder weakness and upper-arm numbness; an injury at C6 will produce biceps weakness and thumb ▶

The cervical spine



Figure 1. Illustration of the anatomy of the neck, showing the relationship between cervical vertebrae, disks, the spinal cord, and nerve roots.

Illustration: Studio Kayama

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and index finger numbness; and an injury at C7 will produce triceps weakness and numbness along the posterior forearm. Pain resulting from nerve root injury will produce a similar level-specific pattern, although pain patterns are less sharply delineated.

Things that happen in the neck are also similar to what happens in the lumbar spine. Disks deteriorate, bulge, and can herniate. Bones degenerate, lose height, and develop spurs. Ligaments can enlarge or hypertrophy. These processes singly or in combination can result in pinching of nerve roots (cervical radiculopathy), narrowing of the spinal canal (stenosis), and compression of the spinal cord (myelopathy). Disk herniations are less common in the neck than in the lumbar spine. About three-quarters of the problems attributed to pinched nerve roots in the neck stem from bony degeneration with associated disk bulging—a process called cervical spondylosis. These processes occur gradually with aging, so the aging demographic of woodturners means we're collectively a vulnerable group. In addition, the physical stresses on our bodies from what we do in order to turn wood—lifting, twisting, and working with our heads and arms at odd angles—adds to that vulnerability.

Anonymous Case Study 1

S.F. has experienced longstanding problems with neck pain that he relates, originally, to carrying a heavy book bag over his left shoulder while in school. He gradually developed recurring pain, decreased neck mobility, and "cricks."

He was prescribed cervical traction, which was awkward, cumbersome, and ineffective. He later tried acupuncture associated with electrical stimulation of his muscles. This was initially beneficial but had diminishing returns over a series of ten treatments. Nonetheless, after that, he felt overall improved. Later diagnostic electromyography (EMG) and nerve conduction testing (NCV) were inconclusive.

Ultimately, a physical therapy program that included heat, massage, stretching, range-of-motion exercises, neck strengthening, joint mobilization, and electrical stimulation produced more sustained results. S.F. still contends with an area at the base of his neck and over his left shoulder blade that is chronically tender, swollen, and tight. His neck and shoulder will occasionally "lock" and on some days he cannot turn at all. He has a constant sense of being "hunched" and "craned" when at the lathe, despite efforts to combat this, and he has trouble tolerating protective head gear due to the additional weight.

The gradual onset of neck and shoulder symptoms, possibly due to habitually bad posture, is not uncommon. It doesn't, however, help one to differentiate chronic symptoms that are purely muscular in origin from those due to underlying cervical spondylosis or other skeletal problems, or from a combination of the two. The early onset of S.F.'s symptoms points to a problem that was originally purely muscular. Areas of chronically swollen and tender muscle may be due to a gradual process of persistent inflammation with secondary fibrosis that is difficult

to overcome. Aggressive deep massage of these tender "lumps," while painful when performed, may give relief of variable duration. However, they tend to eventually reappear.

Anonymous Case Study 2

K.R. experienced a sudden popping in his neck, shoulder, and right elbow when his work partner dropped one end of a wet log that they were carrying together. Initial soreness was followed within two days by extreme pain. Over two weeks, he consulted with three different specialists and was given three different diagnoses. One said he had three compressed disks in his neck. One said he had strained a large set of shoulder girdle muscles. And one said he had damaged his ulnar nerve at the elbow. He did not undergo cervical MRI nor, apparently, other diagnostic imaging. Acupuncture gave immediate but short-lived relief. Therapeutic massage resulted in greater and more sustained improvement. He ultimately developed a program of stretching and neck-strengthening exercises. Since his injury, K.R.'s right hand cramps when he is turning. He has consequently relied on different mechanical aides such as a support-bar system for the hollowing of even small objects.

K.R.'s injury was obviously abrupt and related to a sudden and unexpected jolt at a time when he was already exerting himself. The evolution of initial soreness to extreme pain over forty-eight hours is consistent with the development of a severe localized inflammatory response with associated spasm of neck and shoulder girdle muscles. The overall mechanism of injury points to a process arising in the neck or shoulder rather than in the arm itself. Injury to the C8 root in the neck may resemble injury to nerves deep in the shoulder area (the

brachial plexus) or injury to the ulnar nerve at the elbow. What matters for K.R., however, is the resultant hand weakness, fatigue, and cramping when turning. A more concerted effort to localize the injury with MRI and other diagnostic testing might have led to more targeted therapy and, perhaps, a quicker and more complete recovery.

There are no set criteria for a “work-up” for persistent neck pain. Symptoms that begin acutely and persist for four to six weeks despite conservative management, the presence of distinct weakness or sensory loss, or evidence of spinal cord involvement warrant diagnostic testing. The most useful single test is an MRI scan of the neck that will reveal abnormalities of muscle, nerves, and disks, as well as of the bony structures of the spine (*Photos 1 and 2*). Other types of imaging studies, such as X-rays, may reveal comparable information but are less straightforward or less accurate.

Possible treatments

Conservative treatments may include heat and ice, non-steroidal anti-inflammatory drugs, short bursts

of oral corticosteroids, short-term immobilization of the neck with a soft or hard collar, cervical traction, acupuncture, massage, and active range-of-motion and neck-strengthening exercises. At the next level are epidurals—injections of steroids over the connective tissue layer that covers involved nerve roots. There is no formula for the use of these modalities. Varying combinations may be based on experience or trial and error. And, despite wide use over decades, there are really no large-scale, long-term, controlled scientific studies of their effectiveness.

Surgery on the neck is considered when symptoms persist for six to twelve weeks or longer, when there is functionally significant weakness, and whenever there is clinical evidence of spinal cord compression. The most commonly performed surgical procedure is to remove bone spurs that are directly compressing and irritating nerve roots. Surgery may also be performed to remove bulging or herniated disks and to “open” a narrowed spinal canal. The levels of the neck most likely to undergo degenerative change are

those with the greatest mobility, specifically C5/C6 and C6/C7. When disks or substantial pieces of bone are removed, surgeons will stabilize the neck with grafted bone or metallic plates. Fortunately, the neck remains flexible unless it is fused at multiple levels.

In closing

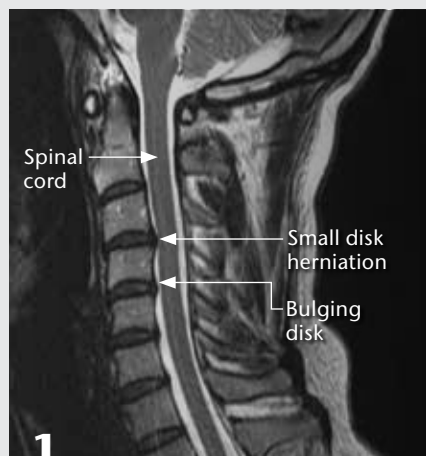
I would love to be able to tell fellow turners how to avoid neck problems. But a lifetime spent supporting our heads, bending, and turning will take its toll. And sudden jolts, odd twists, and awkward lifts are going to happen. On the bright side, habits of good posture and exercise with attention to flexibility and range of motion will diminish our experience of neck problems and may diminish the degenerative changes that come inexorably with age.

When neck problems arise, they can affect woodturning in countless ways. Consequently, whether to turn and what modifications to make become a matter of personal judgement, informed by sound professional evaluation and taking into consideration individual circumstances. Effective treatment may require changes in body mechanics and tool modifications at the lathe as well as strategies for building strength, flexibility, and endurance when we are away from the shop. ■

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For practical advice and a deeper dive into how woodturners can mitigate the effects of neck pain as it relates to lathe work, see Robin McIntyre’s sidebar article, “The Woodturner and Neck Pain: Strategies for Relief,” on page 34.

Comparison of neck MRIs



MRI scan of the cervical spine showing mild degenerative changes, including minimally herniated and bulging disks at C3/C4 and C4/C5, respectively.

Images courtesy of John Whitaker, M.D.



MRI scan showing more severe degenerative changes of vertebrae and disks. There is compression of the spinal cord at C7.

The Woodturner and Neck Pain

Strategies for Relief

Robin McIntyre Photos by Andrew Campbell.

There are several strategies you can employ to enhance your neck comfort during turning sessions. To start, if you consider that your body is your most important machine, it makes sense to perform regular maintenance on it. Making simple alterations to your turning routine can also help minimize neck-related symptoms. Note that if you are experiencing some of the more serious neck conditions noted in Rich Foa's preceding article, consider seeking medical interventions individually tailored to your needs.

Body prep—warm up and stretch

Just as you prep a blank for ease of roughing, it is a good idea to prep

your neck to enhance its function before and during turning. Apply heat on your neck and shoulders, using a heating pad or microwave pack. Perform a series of stretches to maintain and improve the flexibility and comfort of joints and muscles. This can be done before you start turning and during breaks in your turning session. Note that neck flexibility varies from person to person, depending on several factors—general conditioning, age, gender, and pre-existing conditions—so move only within your comfort range for a gentle stretch.

Good form is one of the most important aspects of stretching. Stand upright, as if your body were

positioned between two sheets of glass, and hold your lathe for balance as needed. Move only the neck and/or shoulders during the following stretches, holding each comfortably for thirty seconds.

Shop setup and safety equipment

Consider these shop setup and maintenance ideas to ease the strain on your neck.

- **Lathe height.** Spindle at elbow height or slightly higher is generally accepted as a good choice. Also, check the height of your grinder and worktable and adjust to a comfortable height for an upright posture and neck position.

Chin to chest stretch



Ear to shoulder stretch, both sides



Nose over shoulder stretch, both sides



Backwards chin tuck



Start with the chin extended forward, then “turtle” your chin back to flatten out your neck curve.

Shoulder rolls



Roll your shoulders up, back, down, and forward slowly, then reverse the direction.

- **Shop layout.** Ironically, if your shop is set up so efficiently that you almost never have to change positions, your neck could be adversely affected by lack of movement. It is good to vary your posture and get some neck and total body movement during turning sessions.
- **Lathe operation.** When you have to strain using your hands and arms to perform tasks at the lathe, such as adjusting the banjo or toolrest position, your body tries to compensate using your neck and back muscles. Use a lubricant regularly on your banjo, tailstock, tailstock wheel, and lathe bed to ease the stress on your neck. Try a captured system for hollowing, which supports and stabilizes the tool with less strain on your neck.
- **Personal protection equipment.** The weight of faceshields and respiratory helmets and masks can add to neck strain. Try various shields and respirators to find the lightest, most comfortable models that still offer suitable protection.

You and your turning

Attention to turning form and technique is important for every level of turner and his/her body and neck.

- **Posture and position.** Good posture starts with a well-aligned foundation. Your feet should be aligned to directly support your back and neck. Wear shoes or boots that provide level support without worn-down heels. As you turn, periodically clear the shavings from under your feet, so you are standing on a clean, level surface. To help you stand as upright as possible, rather than bending forward, position your body close to the lathe.
- **Whole body movement.** Moving your body with the tool supported against your torso,

Multiaxis tool handles



These tool handles, made by Richard Wright, were turned on three axes, resulting in a non-round shape conducive to better ergonomics.

- rather than moving the tool with just your arms and hands, will protect the smaller muscles in your neck. Allow the larger muscles in your legs and trunk to do the bulk of the work.
 - **Good vision.** Being able to see well as you turn directly impacts the comfort of your neck. Holding your head at odd angles to accommodate visual challenges can add unnecessary strain to your neck muscles. For most turning tasks, we use mid-range vision. If you wear bifocals or poorly adjusted trifocals or progressives, you may be unknowingly tipping your head either forward or back to achieve the required range.
 - **Work pace.** Take periodic breaks from your turning. Move in different ways, change your position, and give your neck a break. Subtle changes such as switching from an overhand to an underhand grip on tools can vary the position of your arm, shoulder, and neck.
 - **Tool handle ergonomics.** Consider modifying your tool handles with textured wraps. Eric Lofstrom addressed this topic in the June 2019 issue of *AW* (vol 34, no 3, page 31). Also, consider turning or purchasing non-round tool handles. Both of these suggestions can lead to a lighter grip and less strain on your neck muscles.
- Turning strains our bodies, and our necks are particularly susceptible. Consider making changes in your shop and approach to turning to minimize neck strain symptoms. Attention to key details can make a significant difference in the comfort and function of your neck, ultimately affording you more turning enjoyment. ■

Robin McIntyre is a retired physical therapist with both bachelor's and master's degrees in physical therapy. After working for thirty-eight years in clinical practice and teaching, Robin is now a hobbyist woodturner currently serving as the secretary, newsletter editor, and WIT liaison for the Cape Cod Woodturners.