



Back Health

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Know your aching back

Learning a little about back anatomy can go a long way to help deal with back pain. You might even be able to prevent it.

Almost every American has experienced some back pain at one time or another. Back pain is the second most common diagnosis in the outpatient setting, after headaches. Whether the cause is degenerative or traumatic, back pain leads to missed days of work and temporary disability in three-to-four percent of the American population each year.

The spine through the ages

Our backs weren't designed for the modern sedentary lifestyle. Anthropologists believe that early humans were bipeds (walked upright), but also spent time on all four limbs. After examining the skeletons of prehistoric species, they think the spinal structure changed as human beings stood for longer periods. The lower spine curved more and more over the eons. That curve, the lordosis, supports upper body weight better than the straight spine of much earlier primates that walked on all fours.

Does a more curved lower spine help us deal better with life as an upright but often seated creature? Just the opposite. While increased curvature of upper or lower spine does handle the weight of the upper body on the pelvis, the benefits of a slightly curved spine end at a certain point. Complications of poor posture and obesity tend to offset the stabilizing design. Perhaps further modifications over eons will help us to live life seated. No one is sure. Nonetheless, maintenance of the natural "S" curve is essential to good back health.

S.O.S: Save our "S"

The spine is naturally configured in an "S" curve from the side. A slight concave curve of the cervical spine (neck) gently changes to the longer convex thoracic (chest) area ending in a concave curve of the lumbar region. The neutral "S" curving cervical, thoracic and lumbar spine is also the most stress-free state.

Know your aching back (continued)

Yet, due to everyday demands, not even from lifting heavy objects, but just by driving, standing or sitting at a desk for hours at a time, our spine strays from the comforting “S.” The neck and mid-back suffer as we slouch forward or bend the wrong way repeatedly. One day, our back is abused just once too often. Picking up a crumpled piece of paper that didn’t make it into the trash brings on a sudden twinge of pain. Our back reminds us that it is there and demands our attention.

The back is the spinal vault

Like the brain protected by the skull (a fusion of several bones), bones called vertebrae surround the spinal cord. The highway from brain to limbs, the spinal cord, carries information about our world and our intentions – both voluntary and automatic. The index finger tip touches the stove, senses that it’s hot and generates a signal that travels up the median nerve to the brachial plexus (grouping of nerves near the axilla or armpit) to the cervical spine and then to the brain. Our sense of touch is processed and the brain generates an impulse that travels down the spine from nerve-to-nerve, and in a lightning flash, we withdraw the finger.

A vulnerable vault

The back does a fine job of protecting the delicate spinal cord. Why is it prone to injury? Unlike the skull, the back must stay flexible while providing bony protection for the spinal cord. Bending and twisting is only possible with specialized structures called vertebrae and their supporting muscles and ligaments. These components work together, but each is subject to its own share of problems.

Muscles and ligaments

Back muscles are the most frequently injured structures because they are already working very hard to maintain the “S” curve. Bending too far, or the tendency to overextend with a poor posture, puts more strain on back muscles. Eventually, whole regions of back muscles tighten. Continued demand on tight, tired muscles leads to the injury and pain of a muscle strain, or even a torn ligament when the attachment of muscle to bone gives way.



Vertebrae

Each vertebra is made up of a body and arch. The vertebral body houses a spongy central disc that allows for movement of the vertebra above and below. Behind each vertebral body, the spinous process contains a portion of the spinal cord, which runs continuously above, and below, opening up into nerve roots that converge again to form major peripheral nerves.

In spite of their complex design, the vertebrae cannot handle life’s forces without the help of the back muscles and ligaments. When an area of muscle weakens, the stress is transferred to the closest vertebrae at the ligament, which surrounds the disc. Eventually, the ligament gives way and the disc slips forward onto the spine or nerve roots.

The spinal cord

So why make us carry a “vault” on our back? All the armor of the vertebrae (bones), muscles and ligaments serves to protect the spinal cord, a delicate, whitish gray vertical tube. The spinal cord is composed mainly of myelin, a fatty substance that insulates nerve fibers. Nerve cells and other nutrient-supplying cells gather in clusters to receive and transmit impulses from the brain and out to the rest of the body and back.

Four gentle exercises to strengthen your back and help prevent back pain

These gentle exercises can help strengthen your back and help prevent back pain

For a sore back, exercise is the last thing on your mind, and that's OK. But once your back is healed, ask your doctor about the protective benefits of exercise.

Start your exercise program

If your doctor gives you the OK to start exercising, begin with a warm-up followed by these gentle back and abdominal exercises.

Cat-cow warm-up

This helps to loosen the joints of the spine and restore flexibility to the spinal muscles and ligaments.

- ▶ **Starting position:** Start on all fours, hands and knees on the floor. Knees are hip-width apart and hands are below your shoulders, elbows straight but not locked. Look down at the floor.
- ▶ **Action 1:** As you exhale, let your head move toward the chest while rounding your back like a cat (spine toward ceiling). Hold for 10 seconds.
- ▶ **Action 2:** As you inhale, slowly yield to gravity. Let your stomach move toward the floor (arching lower back) while allowing your shoulder blades to move together. Hold for 10 seconds. Alternate between the two positions.

Bird dog

This exercise is good for the upper and lower back and hamstrings (muscles in back of thigh). It is a good follow-up after the cat-cow warm-up.

- ▶ **Starting position:** On all fours, hands and knees on floor.
- ▶ **Action:** Extend one leg and the opposite arm so that they are parallel to the floor. Hold this position for seven to eight seconds, and then repeat with the opposite arm and leg.

Pelvic tilt

You can do this exercise alone to isolate your lower back or in sequence with the warm-up and other exercises. Do it on the floor or firm surface.

- ▶ **Starting position:** Lie on your back with your knees bent, feet flat on the floor. Leave a space between the small of your back and the floor.
- ▶ **Action:** Tighten your abdominal muscles so that the small of the back presses flat against the floor. Hold this position for five or six seconds then relax, allowing a space again between the small of your back and the floor. Repeat three times and gradually increase to 10 repetitions.

Abdominal contractions

This helps to build abdominal muscles, which support and protect the lower back.

- ▶ **Starting position:** Lie on your back with knees bent, feet flat on the floor with hands resting on the abdomen below ribs.
- ▶ **Action:** Tighten abdominal muscles while pulling the abdomen in and down. Continue to breathe while holding the contraction for five seconds. Relax, then repeat 10 times.

Does aerobic exercise help the back?

Yes. Aerobic exercises – like walking, biking or swimming – use a lot of oxygen. They keep the heart pumping, work large muscle groups and keep the back strong. Try walking during your lunch break, biking with your family or going for a swim. These types of activities are endurance exercises. They can help improve blood flow to the back and strengthen and relax the back muscles without jarring them.

Four gentle exercises to strengthen your back and prevent back pain (continued)

Isn't a little pain OK when exercising the back?

The “no pain, no gain” mantra has no place here. If you have significant pain before or during the exercises, that's your body's definite signal that this is something you should avoid.

What are some other ways to prevent back pain?

- ▶ Avoid sitting for long periods.

- ▶ Stand up at intervals while talking on the phone.
- ▶ Walk the aisles during long flights.
- ▶ During long car rides, stop from time to time to walk around and stretch.
- ▶ Lose weight. Carrying extra weight, especially in the abdominal region, can throw off your body off balance and place added stress on the back.
- ▶ Avoid smoking. It is a risk factor for degenerative disc disease, a major cause of back pain.

Staying in the game: How to keep your back healthy

Back pain robs workdays and keeps people on the sidelines. Learn how your back works and why certain motions can raise your risk for injuries.

Back pain is one of the most common conditions in the United States. Over the course of a lifetime, eight in 10 Americans will have at least one episode of back pain.

The problem results in over 100 million lost workdays per year. And over 41 million people visited a doctor for back pain in one year.

Back injuries – common causes

Many back injuries are the result of cumulative damage. But certain motions and movements can contribute to back injuries more than others. These include:

- ▶ Heavy lifting
- ▶ Twisting at the waist while lifting or holding a heavy load
- ▶ Reaching and lifting
- ▶ Lifting or carrying objects with awkward or odd shapes
- ▶ Working in awkward positions



- ▶ Sitting or standing too long in one position
- ▶ Poor posture

How the back works

A spine consists of small bones called vertebrae. They are stacked to form a column. Vertebrae are held together by ligaments, and muscles are attached to the vertebrae by tendons. A cushion, or disc, sits between each vertebra. The spinal cord runs through the column and nerves branch out through spaces between the vertebrae.

The lower back holds most of the body's weight. Stress is placed on your back every time you bend over, lift something heavy or sit leaning forward. While standing, bending or moving, even minor problems with bones, muscles, ligaments or tendons can cause lower back pain. Discs may then irritate nerves from the spinal cord and cause pain.

Sudden back injuries can be due to a tear or strain in ligaments and muscles. Back pain may also come from

Staying in the game: How to keep your back healthy (continued)

injuries that break down discs or by muscles that have involuntary contractions (spasm). Stress or tension can bring on back spasms, too.

What can you do to avoid back problems?

Three practices may help avoid serious problems: Lift safely, sleep correctly and keep up with core conditioning.

Lift safely

When possible, use lift-assist devices for heavier objects. When you can't avoid lifting, remember to reduce the amount of pressure placed on the back. Bending the knees keeps your spine in better alignment and allows legs to do the work.

- ▶ Keep feet apart for better stability and lifting power.
- ▶ Keep your back straight so spine, back muscles and organs align right.
- ▶ Tuck your chin to keep the neck, head and spine straight.
- ▶ Grip an object with your whole hand for more lifting power.
- ▶ Keep arms and elbows tucked in for more gripping power.
- ▶ Center your body over your feet for better balance and lift.

- ▶ Bend your legs and then lift by straightening the legs. The leg muscles will carry the load instead of your back.

Sleep better

A poor sleeping position can create back stress. The best sleeping positions are:

- ▶ On your side with knees slightly bent
- ▶ On your back with a pillow under knees

Conditioning

Regular exercise can improve overall fitness and lower the likelihood of back problems and injury. Exercises for strength, flexibility and aerobics are best.

Get into a daily flexibility routine and do strength training for your core muscles. The core muscles surround your midsection, support spine and torso movement, and coordinate limb motion. Strong core muscles improve posture, balance and stability. They can also reduce back and neck pain.

Yoga and Pilates classes offer good core workouts. Each uses the body as its own form of resistance. If you have trouble doing certain exercises, swimming, walking, or bike riding may be good options. Always check with your doctor before you increase your activity level.

Getting your back on track

Treatments for back pain

After your back is injured, you will want to learn new habits. Once you're feeling better, improved posture, practicing back-safe lifting techniques and a fitness routine (and weight loss, if necessary) will all help to keep your back healthy. However, before you start to use your back, it must first heal.



Getting your back on track (continued)

Bed rest, ice and heat

If your back pain is severe, stay in bed, but no longer than two days. Prolonged bed rest weakens your back and deconditions you, overall. Make sure you get out of bed and walk around a few times a day.

Apply ice then heat. In that order. In acute muscle strain, the ligament holding the muscle to bone is stretched to the point of tearing. Blood rushes in to repair the tendon, resulting in pain over the muscle. Ice helps to soothe sore muscles and reduce the area of pain. Thus, for the first few days after injuring your back, apply an ice pack to the painful area for about 20 minutes at a time, a few times each day. Wrap a towel around the ice bag, so that only the towel contacts your skin over the painful area.

Muscles also tighten or spasm in response to injury. It is your body's way of blocking off a certain muscle group to permit repair and, as research shows, as a secondary method to protect the spine. Once the pain is reduced, apply a heating pad for about 20 minutes at a time for several times a day. Heat further reduces the pain and tightness.

Pain medications

Over-the-counter, nonprescription pain medications are helpful. Be careful. All aspirin and non-steroidal antiinflammatory drugs (NSAIDs) can lead to stomach bleeding. Each has other associated hazards. Always read product labels first. Ask your doctor or pharmacist if you have questions. All of the following drugs, except acetaminophen (Tylenol), reduce inflammation:

- ▶ **Aspirin:** Bayer, Bufferin, Ecotrin and others. Use with caution if you have a bleeding disorder, expect to undergo surgery or if you have asthma, ulcers or gout.
- ▶ **Tylenol:** Acetaminophen. Only reduces pain, not inflammation. It is safer for the stomach. Taking more than indicated can cause liver damage, especially with alcohol.
- ▶ **Ibuprofen:** Motrin, Advil. Can cause stomach bleeding. Avoid if you have aspirin allergy, have liver or kidney problems or you are on blood thinners. Talk to your doctor first.
- ▶ **Naproxen:** Aleve. Lasts for about eight hours, about twice as long as other analgesics. Do not use if you have ulcers, heart failure or kidney failure or if you are on blood thinners.

Low back red flags

Call your doctor if you have:

- ▶ Tingling, weakness or numbness of either leg
- ▶ Pain down the leg
- ▶ Weakness
- ▶ Gait problems
- ▶ Loss of bladder or bowel control
- ▶ Nausea, vomiting, fever, chills
- ▶ Severe pain after injury, such as in a fall or automobile accident

