

Avoiding Back Pain

For trouble-free service, stretch, exercise and watch your posture

by Chris Dunn

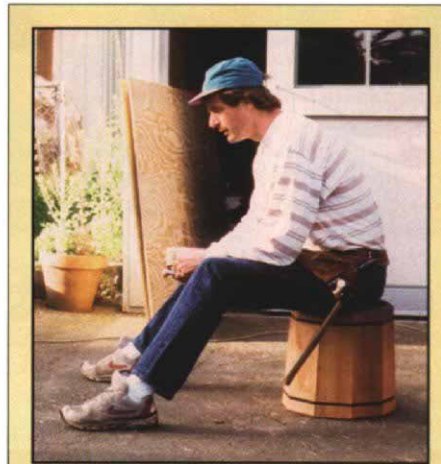
When my carpenter's back started hurting 13 years ago, I embarked on a frustrating odyssey through mainstream and alternative health-care systems, searching for that single treatment that would "fix" it. I got X-rayed, rolfed, accupunctured, heated, iced, cracked, polarized and therapized. When I failed to find a fix, I opted for a career change. I am now a psychologist, and I often work on a medical team that treats people who suffer from chronic back pain.

Considered the kiss of death among builders, back pain can be financially and psychologically expensive. Financially, a back injury can cause huge medical costs, lost billable time and construction delays. Psychologically, the costs of back pain can range from anxiety about one's fitness for work to depression and marital problems. A large percentage of builders' disabilities can be attributed to back pain, much of which could have been prevented through education and training.

With the exception of sudden accidents like falling, most back injuries result from prolonged, faulty body mechanics at work coupled with poor back hygiene at home. Back injuries often start without warning. Using poor body mechanics can painlessly overstretch ligaments, overcompress disks or create muscle imbalances that are a setup for pain later on.

Now that I'm working in the medical community, I've finally learned the methods I needed to know as a builder to keep my back in good shape. I still enjoy carpentry, and I've come up with some simple routines to minimize the strain on my back. I'm now 42 and no longer work-hardened. But by practicing these methods I can do heavy work with much less pain than I had in my 20s. Human nature being what it is, folks who have never had any back pain may not see the merit in the advice presented here. But if you want to stay pain-free, these routines can help you get through a day's work with your mind occupied by the job—not by your aching back.

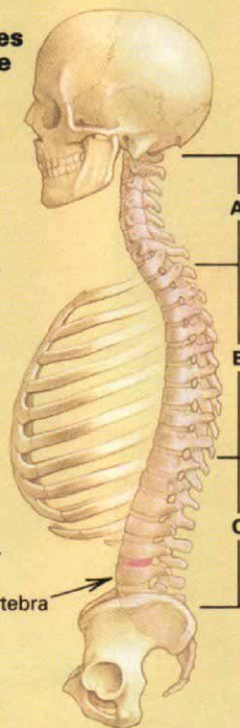
Parts is parts—The first step toward a pain-free back is to start treating your back like your most valuable tool. Like a tool, the spine is made up of moving parts, and as an orthopedist once warned me, "parts wear out." So how do you make it through a long career without wearing out these precious, nonreplaceable parts? By understanding how the back works and minimizing wear and tear on it every chance you get.



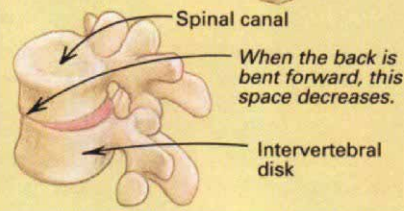
Don't sit this way
Hunching forward while sitting perpetuates the position you're working in much of the day. Use your rest time to get out of this position.

Three curves of the spine

In the neutral position, the spine has three curves. When you're bent forward all day, the curves of the cervical vertebrae (A) and the lumbar vertebrae (C) straighten out while the curve of the thoracic vertebrae (B) gets exaggerated. These prolonged, unnatural positions can lead to cumulative stress and pain.



Where disks get squeezed



If you count the tailbone, your back basically consists of a vertical stack of 25 vertebrae that are shaped like hollow cylinders. This stack of hollow bones is held together by gristly straps called ligaments. The nerves of the spinal cord are located inside this hollow stack like wires in conduit. When your spine is in a neutral position, it has three front-to-back curves at the neck (cervical vertebrae), the chest (thoracic vertebrae) and the lower back (lumbar vertebrae) (drawing, left). At different levels the nerves pass between these vertebrae and travel to various parts of the body. This delicate but resilient stack of bones supports the dead load (body weight) as well as the live load (what you are carrying or lifting) without pressing on the wiring. Attached to these vertebrae are the back muscles, which are rigged like the stays on a sailboat mast, running upward and downward and attaching to body parts on the sides, the front and the back. When the front muscles (stomach muscles) fire, they bend you forward or prevent bending backward, like when you're driving screws overhead. When the back muscles fire, they bend you backward or prevent bending forward, like when you're hunkered over a workbench or a drafting board all day. When the muscles on either side fire, they pull you to that side or prevent bending to the other side. For example, when you carry a sheet of drywall on your left side, your right-side spinal muscles keep you from flopping over to the left.

The front, back and side muscles exert constant forces on the spine. Builders get hurt when they use one set of muscles too much—it's like overtightening some of the stays on a boat's mast and loosening the others. When you work with the spine out of its neutral position too long, sooner or later its three natural curves get distorted beyond factory specs.

Between each pair of vertebrae sits a hydraulic shock absorber called an intervertebral disk. Your disks can actually withstand much wear and tear, but when they deteriorate—usually by bulging and pressing on the nerves—you get PAIN. All loads cause your disks to squish down—they're supposed to. That's why we're slightly shorter at night than when we first get out of bed in the morning.

The spine is designed to bear enormous loads in the neutral position. However, if you lift or exert a force when your spine is bent or twisted, the load isn't transferred evenly through the



You can stand up straight to rest.

Resting positions

When it's time to take a break, eat lunch or think about the job, you can stand, sit or get prone. In the first stand-up position (photo left), the spine is neutral, hands are on the hips to rest the shoulders, and the knees are slightly bent. In stand-up position #2, bend forward at the waist with the arms supporting the upper body (photo right). The back is straight, and the knees are slightly bent. When sitting, use a piece of plywood to keep your back straight (photo below left). In the prone resting position, keep your knees bent and your arms relaxed across your chest (photo below right). Do this a few minutes every day during work.



You can also rest by bending forward.



Keep your back straight when sitting.



Bent knees and hands folded across the chest ensure a straight back.

Stand-up work position. The correct standing power position includes slightly bent knees with the legs apart. If you're doing this correctly, your thighs should get tired, not your back. Note the belt-high workbench.



Avoid standing this way. Prolonged forward bending causes back aches. Don't spend much time in this position.



disks. Instead, the disks (bottom drawing, p. 76) are compressed by the uneven loads, causing them to wear out prematurely. Your job as a back manager is to work and rest in positions that avoid uneven loads on the spine.

The positions—There are only two things my body does: rest and work. When I'm resting, I'm in a resting position. When I'm working, I'm in a power position. Every minute that you're not lifting, bending or pushing, you can be resting.

The resting positions are standing, sitting and lying (top four photos, p. 77). They return the spine to a neutral position with no bends or twists—only the three natural curves. You can always hang out in one of these three resting states when you are thinking, chewing the fat, taking a break or eating. Don't slouch when sitting (photo p. 76).

Whenever I get a twinge in my back at work, I immediately lie down until it goes away or at least stabilizes. This can make the difference between returning to work the next day or staying in bed, on ice, curled up like a giant shrimp.

Power positions—While working, you should be in one of several power positions. A power position is a work position in which the spine is neutral. It is the safest position because it allows the spine to carry loads in the way it was designed to carry them. The simplest standing power position is with your legs bent and slightly spread and your lower back straight (bottom left photo, p. 77). This position keeps the joints between your lumbar vertebrae stable. This position also uses your thighs a lot, and when done correctly, you should feel fatigue in your thighs, not in your back. From this position you can lift, drag and push in relative safety. Keep the time you spend standing over your work with a bent back (bottom right photo, p. 77) to a minimum.

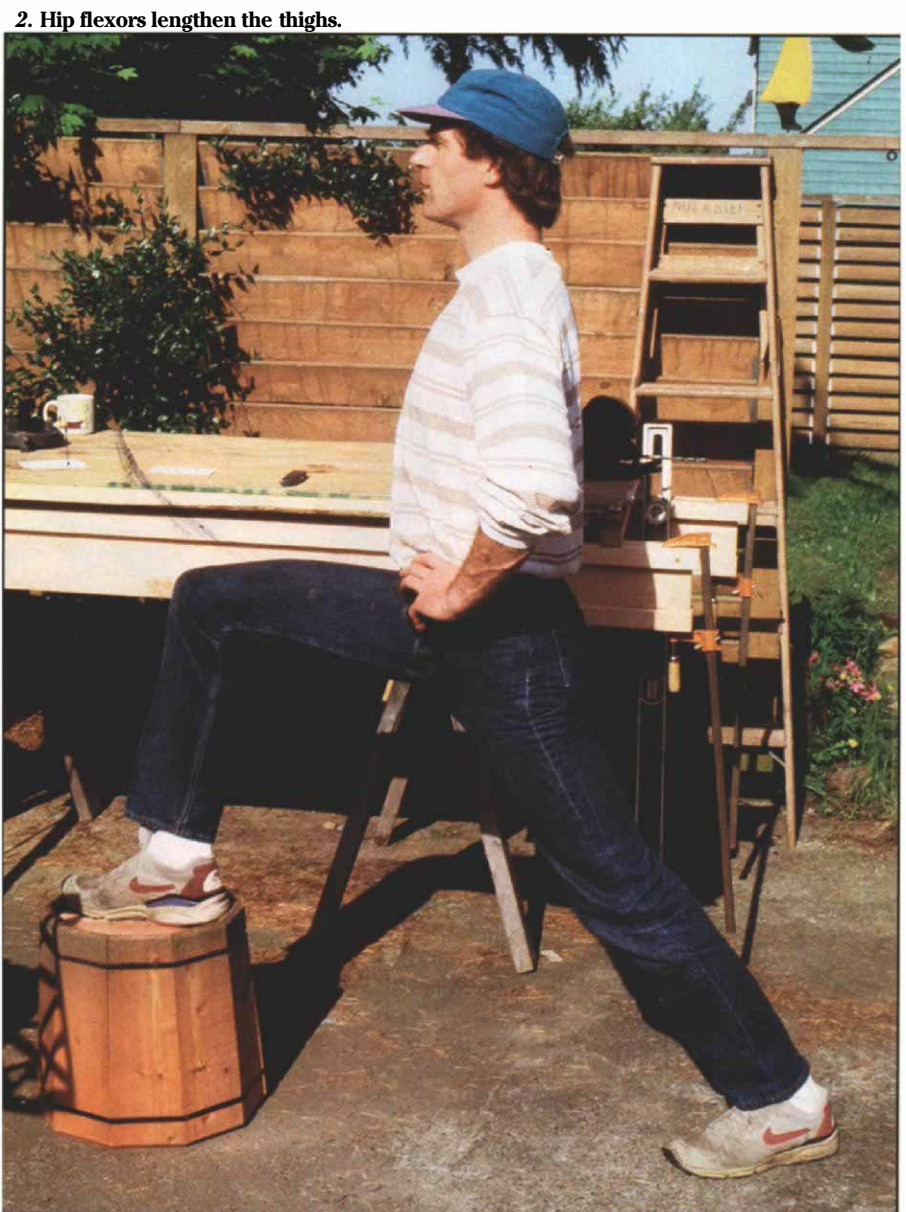
Kneeling can also be a power position. With both knees on the floor (always use knee pads) and one hand on the floor or ground (top left photo, p. 80), you can scrub, hammer, screed, push or pull—all with one hand. The triceps (push-up muscle) of your supporting arm carries much of the load here, not your back. Another kneeling power position is kneeling on one knee, with your forearm across the other knee. From this position you can use your nonkneeling thigh as a fulcrum, like when you're shoveling or lifting toolboxes. When shoveling, work on one knee using knee pads whenever possible. This gets you down much closer to the hole and allows you to lever the shovel across one of your knees like a teeter-totter (top right photo, p. 80). You can actually flip dirt off the shovel by pushing down on the handle instead of lifting up on the handle. Avoid shoveling positions that bend your back (top photo, p. 81).

Finally, an extremely useful power position is simply lying on your back. This is an excellent position for assembling a P-trap under the sink or painting the underside of surfaces. I've seen many builders work in kneeling positions when they could more easily lie down.

The advantage of using power positions is that you use your arms and legs much more than your back. Any time you can plant a hand on the



1. Bending forward stretches back, legs and shoulders simultaneously.



2. Hip flexors lengthen the thighs.

Stretching and strengthening

If you have the discipline to oil your pneumatic nailer every morning, you can learn to warm up properly and do a few daily exercises. If you don't like counting repetitions as you exercise, just use the burn principle: Go until the muscle you are using burns. Here are five exercises (three strengtheners and two stretchers) that can be done in about 10 minutes per day. Try doing them every day when you first get to work, starting with the stretchers. Do each exercise for about two minutes. And do each one in super-slow motion. These exercises put a strain on your spine, so don't do them if your back hurts. If any of these exercises causes back pain, stop the exercise and see a physician.

1. Back stretching. This will stretch the back of your legs, your shoulders and your back at the same time. Stand about 3 ft. from the front of your truck or a workbench. Bend forward until both palms rest on the hood or whatever is about waist-high for you. Straighten both arms, your back and your legs while you push your butt out. Hold for 90 seconds.

2. Hip flexor stretching. The tops of builders' thighs get overshortened from prolonged bending and sitting, which sets a builder up for low back pain. With both hands on your hips, slowly lunge forward by bending one knee and placing that foot on your bumper, a bucket or a suitable stool. Keep the rear heel planted on the ground where it was, with the rear leg straight. Keep your back straight (vertical), chest out a bit, and hold it for one minute, feeling the stretch in the front of the rear thigh. Switch legs and hold for one minute.

3. Curl-ups strengthen the abdomen. Lie on your back, knees bent, feet flat on the floor and arms folded across your chest. Press the back of your belt to the floor, then curl up by moving your elbows closer to your knees. The entire range of motion here is only a few inches, just enough to raise your shoulder blades off the ground. Hold that position a few seconds, then lower back down but not all the way so as to get any rest between repetitions. That way you get your burn faster.

4. Arch-ups strengthen the back. Lie on your stomach, arms at your sides, legs straight with your forehead on the floor. Keep your buns tightened throughout this exercise. Now, in super-slow motion, arch up like Superman flying—tops of feet off the floor, upper chest off the floor, squeezing your shoulder blades together. Hold it until your back muscles quiver or burn. Start with 30 seconds and work up to four minutes over a six-month period.

5, 6. Hip extensions strengthen the lower back. Drape your stomach and chest across the seat of a chair or a workbench. Your thighs are vertical. Grab the chair legs or the benchtop with both hands and, in super-slow motion with your knees bent, straighten your lower back until your thighs are horizontal with your knees still bent. Hold for five seconds. Now lower your legs but not all the way so as to get any rest between reps. —C. D.



3. Curl-ups don't require much movement to strengthen the abdomen.



4. Lift your legs, arms and head for Superman arch-ups.



5. He's OK. It's just a hip extension.



6. Complete the hip extension by straightening the lower back.



Use your free arm as a support.

Pick up with a straight back.



Use your knee as a fulcrum while shoveling.

Bend legs when lifting.

Good practices

Brace yourself by kneeling. Kneeling lets you get close to the work while keeping the back in a neutral position. The secret is to brace yourself with your arm. While screeding a stem-wall (left) the author keeps both knees and his free hand on the ground. While shoveling (above) he rests one knee on the ground and his forearm on the other knee.

Full squat for heavy loads. When you need to lift a weighty object, let your legs do the work. Keep your back straight, buns out, legs bent and the load close to the body (right).

Golfer's lift. Pick up small objects with the golfer's lift. Movement is in the hip, not in the spine (below).



floor, on your knee, on the bench, or against the wall before you apply force, do it. Don't stand if you can sit with a straight back. Don't sit if you can lie down with a straight back.

Back injuries result from prolonged, poor body positions, such as working all day at a bench while bending forward at the waist and the neck. Injuries also occur when people apply forces when they're not in a power position, such as when someone bends and twists across their body to pick up a heavy toolbox. If your thighs and triceps are sore at the end of a hard day, you've been successful. If your back muscles hurt, you're losing the battle.

Back-saving tips—Move refrigerators easily by lying on your back, putting your palms behind your head to brace yourself against the baseboard or a cabinet's toe space and shoving the refrigerator with your feet. This trick also works for beds, chests, even table saws.

Use levers. Any time you can push down on something to lever it instead of lifting it, do so.

When you're standing at sawhorses or a bench all day, pay special attention to your lower back. I put one palm on the bench and use the triceps of that arm to support some of my upper body. If that arm gets tired, I know I'm doing it right. Likewise, if I stand with my knees bent to allow my back to straighten, and my thighs start to burn, I know I'm doing it right.

Experiment with the heights of work surfaces to find what's right for you. A rule of thumb is to raise work surfaces, such as your bench, your sawhorses and even your table saw, to belt height. Store your heavy tools waist-high on shelves so that you never have to bend over to put them out or put them away.

Avoid unnecessary hammering or horizontal drilling overhead—use a stepladder even though you can reach the work without one. When you must drill or hammer overhead, look for ways to rest the back of your head against a rafter or a wall. Whenever I have to push hard while drilling horizontally, I'll ask someone to place his hand between my shoulder blades and lean against me like I'm a lamp post. That way I can use my arms to push against his weight rather than using my lower back as a fulcrum.

Don't bend over unless you have to. For example, saw cutoffs directly over the trash can so that you don't have to bend over to pick them up later. Attach junction boxes to your sawhorses at waist level to minimize bending over to plug/unplug tools all day. Keep opened toolboxes at waist level to minimize bending over to get things out of them all day.

Avoid lifting an object off a bench with your arms fully extended. Instead, reach out and drag it along the bench until it's near your belly before you lift it. This is true even for light objects.

Push down on the ends of small boards overhanging your bench to pick them up—kind of flip them up into your hand. If you're making cabinets and have to repeat this action many times, you save wear and tear on your back.

Use the golfer's lift to pick up light objects off the floor so that you don't have to bend your back as much (bottom photo, facing page).

Bad practices

Bending over a shovel causes the back to cantilever into an uncomfortable position. And lifting a heavy load without bending your legs creates a detrimental lower-back cantilever



Avoid bent-back shoveling.



Don't lift this way.

Use a full-squat position to get down for lifting heavy objects. Keep your back in a power position (middle right photo, facing page); don't try to lift substantial loads with your legs straight (bottom photo, above). Have a buddy help you lift heavy objects, even if you can lift them yourself (eat your pride, save your back).

Avoid twisting while you're lifting something. And if you have to turn while carrying a load, don't twist your body. Instead, change the direction of your entire body by pointing your forward foot in the direction you want to go.

Back-saving doodads—Use dollies and carts, if possible, to move heavy loads. Masons should build all-terrain dollies with balloon tires for carrying blocks. Carpenters should build a cart for carrying sheet goods (*FHB* #83, p. 30) or buy one (see *FHB* #81, p. 92, for info on the Panel Skate).

I fetch tools from a pickup covered with a campershell with a hook. I keep a 5-ft. 1x2 in the back of my pickup with a big screw hook affixed to one end. I use it to drag out the toolboxes that slid forward during the trip, so I don't have to crawl in after them. I stow the 1x2 across the truck bed, behind the rear wheel wells to create a small slide-proof storage area between the 1x2 and the tailgate.

I use props and hooks to hold the other end of a board whenever I can. A bent nail or a scabbed-on offcut is a mighty easy way to avoid getting yourself into an awkward position.

Lower-back supports, such as corsets with suspenders or leather weight-lifting belts, are useful as *reminders* to stay in a safe power position. But they do not protect you from the dangers of a beer tumor or weak back muscles. That's where exercise comes in.

Exercise—The question asked most is, "Doesn't my work count as exercise?" Nope. That's because working hard is not the same as working out. Building is certainly strenuous, and it does build strength. But work also overdevelops certain muscles while others, like the abdominal muscles, can languish. Such a muscle imbalance developed over a builder's career can be a setup for injury. Certain back exercises are indispensable, and you can actually get by with very few.

Exercise is not a temporary treatment to make an injury go away. It is part of daily activities like eating and sleeping. Effective exercise (see sidebar pp. 78, 79) can be simple and enjoyable. Exercising 10 minutes per day for 20 years is infinitely better than no exercise for 20 years.

Resting—Rest is as important as exercise. Sleeping in a good bed allows your disks to reabsorb water and regain their shape over night. Many builders develop back injuries during the off hours, by prolonged sitting or lying in bad positions. If you watch television, use a recliner and elevate the television as high as possible so that you won't get a prolonged lengthening of the back of your neck.

Sleeping position can make the difference between recovering from the day's work and having back pain. The idea is to keep your spine supported in a neutral position. This means using props while you sleep to maintain your spine's natural curves and prevent unnatural bending or twisting. Try using a cervical pillow, which preserves the natural curve in your neck. They are hollowed out for your skull but provide a bridge under the arch of your neck. Cervical pillows are available in medical-supply retail outlets, as well as in some bedding stores. If you sleep on your side, put one or two pillows between your knees. If you sleep on your back, place a pillow under the back of your knees. Such props relieve subtle pressures on the spine exerted by the legs and pelvis while sleeping. Pleasant dreams. □

Chris Dunn is a former carpenter with a bad back who now works as a psychologist in Seattle, Wash. This article was prepared with the help of Jeff Fjeltsul, a physical therapist at Seattle VA Medical Center. Photos by Steve Touger.