



046: Injury Prevention–Back

The basics of the back

The back is essentially a collection of small bones stacked one on top of the other. These bones stay in place because of connective tissues and muscle contraction. Not all of the protective muscles are in the back itself, though.

Computer models have shown the spine, its connective tissues, and the back muscles working together cannot support lifting the kinds of loads electricians lift during the course of their work. The force that prevents the spine from snapping is intra-abdominal pressure, which comes from the abdominal muscles.

Of all the abdominal muscles, it is the *transversus abdominus* that makes the most contribution to preventing back injury. For this muscle to do that job, however, you must follow the traditional boot camp admonition to “suck in your gut.” When lifting something heavy, you should contract this muscle. If this muscle is relaxed, the load typically shifts to the lower back muscles and overloads them.

Another muscle that keeps the spine safe is the *recti abdominis*—this is the muscle that allows you to rotate your trunk. When doing heavy lifting, don’t rotate your trunk—rotating reduces the contribution that the *recti abdominis* makes to supporting your spine. The lower back usually has to make up for what the *recti abdominis* can’t do.

Proper lifting

Assess the load. If it is too heavy or awkward to lift safely, ask for help to lift it. This may include using lifting equipment.

Assess the terrain. Don’t try to lift a heavy object if you must do so on an unstable or slippery surface. The presence of gravel, water, oil, metal chips, saw dust, or other debris is a good indication that lifting is unsafe until the location is cleaned or you can move the object to a safe location for lifting.

Look for handholds. If there aren’t any, consider using a lifting strap.

Lift the object by opposite corners, rather than opposite sides, whenever possible. This reduces the likelihood the load will tilt on you.

Always keep your back straight when lifting. Remember: stomach in, shoulders back. You should feel your abdominal muscles tighten.

To lift an object off the ground, squat down. Allow your legs to do the work. Position yourself so your knees are not past your toes, to avoid knee injury. Position your feet on either side of the load so you are straddling the load.

Under ideal conditions, a male electrician in good physical condition should be able to safely lift a box weighing half his lean body weight. Subtract twice the poundage of your body fat from the amount of your weight to determine the maximum you should attempt to lift under ideal conditions. The average 30-year old male American has 25% body fat. *Example:* if you are 6 feet tall and weigh 170 pounds, you likely have 45 pounds of fat. Subtract 80 pounds from 170. You should safely be able to lift a 45 pound box from the ground to chest height under ideal conditions, but don’t assume you always can. Keep in mind that lifting involves many variables and you may not be able to safely lift something even if it isn’t very heavy. Pay attention to the lift.

Do not lift and twist. It is better to lift the object, set it down, rotate it, and lift it

Discussion leader duties for this session:

Obtain an empty cardboard box to use in lifting demonstrations.

What this Safety Talk covers:

How to prevent back injuries

Discussion notes :

