

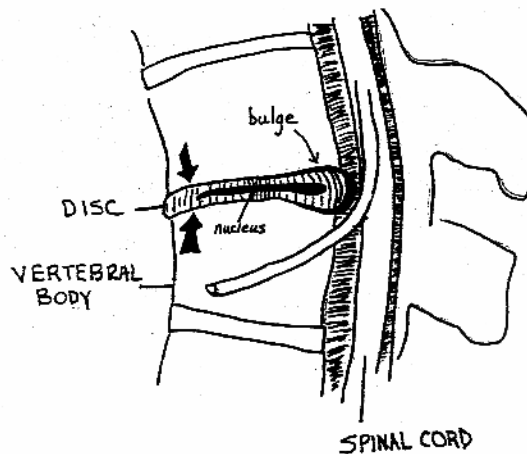
## Back Injuries and Risk Factors for Back Injuries

Backs are another area of our bodies that can be greatly affected by "overuse", repeated motions, and working in awkward postures.

It used to be thought that back injuries were *acute* injuries, occurring as the result of twisting the wrong way, lifting something that was too heavy, or bending down to pick something up. All of a sudden a person feels tremendous pain and may be unable to move.

Medical science now understands that many back injuries result from wear and tear. At some point, when the damage becomes severe enough, sudden pain is felt. However, this type of injury results from days, weeks, months or years of "overuse" rather than one particular motion or incident.

### INTERVERTEBRAL DISC



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The most common cause of non-specific low back pain is the degeneration of the intervertebral disc.

The picture shows the disc itself -- a jelly-like substance between the "vertebral bodies" which are made up of bone and cartilage. The spine is made up of many vertebrae. The spinal cord is a nerve that runs the length of the spine. Discs connect the vertebrae, enabling the spine to bend.

With excessive or repeated bending or twisting, the disc can become squeezed on one side, causing it to bulge on the other -- which is shown in this picture. This bulge can put pressure on the surrounding nerves and the spinal cord, causing pain in the neck, back or legs. Sometimes the disc can deteriorate to the point where the vertebrae rub against each other, damaging the bone and cartilage of the vertebrae.

### **Risk Factors for Back Injuries**

Repetitive lifting: making a lift over and over.

Weight of load: "how much is too much" depends on the size and shape of the object, how far from your body you must carry it, and how long you carry it, as well as other factors. The National Institute for Occupational Safety and Health has recommended a limit of 55 lbs. for the "perfect lift," which includes the following:

- the load is evenly distributed between two hands
- the load is lifted with two hands
- the distance between the hands is 25 inches or less
- hands are in front of the torso
- hands are at the same height
- there is a smooth, continuous lifting motion used
- there is good footing, with two feet on the ground
  - the environment has moderate temperature and humidity.

Awkward grasp of load: having a poor grip on the object you are carrying increases the risk of injury.



Awkward location of load at beginning and ending of lift: having to twist, bend to the floor, or reach over your shoulders to get the object you need to carry.

Awkward posture while carrying: leaning around debris, fixtures or equipment; holding objects beyond forearm length, below knee height, or above your shoulders.

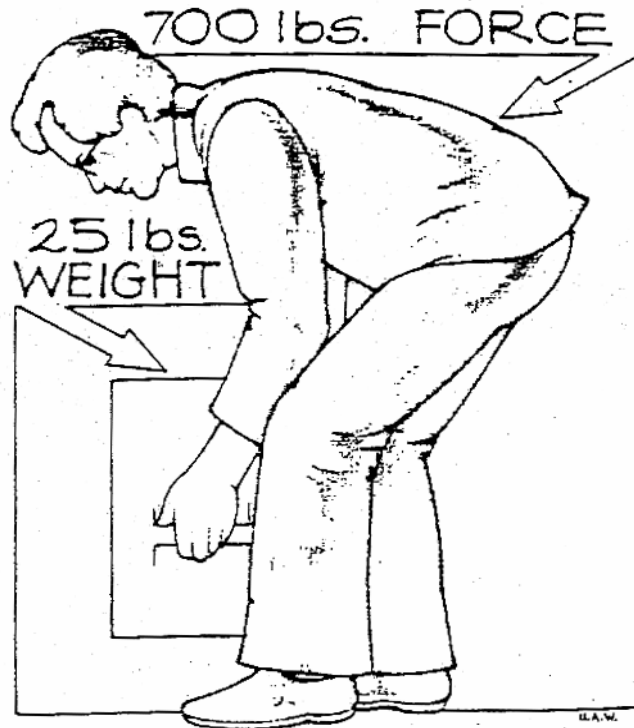
Slippery floors: this can cause you to exert more energy to carry an object than would be necessary with good traction.

Sudden change in the load: an object inside a package may shift and you may slip or have to make a quick adjustment, causing you to twist or move in such a way that strains your back.

OSHA considers the following to be specific risk factors for back injuries:

- Lifting more than 75 pounds at any one time.
- Lifting more than 55 pounds more than 10 times a day.
- Lifting more than 25 pounds below the knees, above the shoulders, or at arms' length more than 25 times a day.
- Repeating the same motions every few seconds or repeating a cycle of motions involving the affected body part more than twice per minute for more than 2 consecutive hours in a workday.
- Pushing/pulling with more than 20 pounds of initial force (e.g., equivalent to pushing a 65 pound box across a tile floor or pushing a shopping cart with five 40 pound bags of dog food) for more than 2 hours total per day.
- Repeatedly raising or working with the hand(s) above the head, or the elbow(s) above the shoulder(s), for more than 2 hours total per day.
- Kneeling or squatting for more than 2 hours total per day.
- Working with the back bent or twisted for more than 2 hours total per day.
- Using vibrating tools or equipment that typically have high vibration levels (such as chainsaws, jack hammers, percussive tools, riveting or chipping hammers) for more than 30 minutes total per day.

### FORCES ON THE BACK WHILE LIFTING OBJECTS



#### Forces on the Back While Lifting Objects

Lifting from the floor can increase the strain on your back. Lifting a 25 lb. box from the floor requires approximately 700 lbs. of back muscle force.

Using *ergonomic job design* principles, heavy objects would not be stored on or near the floor.

Sometimes lifting from the floor is unavoidable. Much attention has been placed on what is called "good" or "proper" lifting techniques. Good lifting techniques include:

- trying out the load first; if it is too bulky or heavy, get help,
- placing the load as close to the body as possible; between the legs is best,
- keeping the back straight and "lifting with your legs",
- lifting slowly and carefully,



- remembering that putting the load down can be more problematic than picking the load up, and
- not twisting the spine while lifting or carrying or depositing the load.

Many ergonomists (scientists who study and promote ergonomic job design) believe that there has been too much emphasis placed on "lifting techniques" and not nearly enough attention to changing or redesigning jobs and workplaces.

A program for teaching workers proper lifting techniques *must never substitute* for redesigning workplaces and jobs to reduce the amount and types of lifts and manual handling.

Proper lifting techniques are not adequate protection against back strain. Under certain conditions (such as lifting an object that is too big to fit between your legs), "lifting with your legs" can actually place more strain on your back than bending over and "lifting with your back"!

It is important to remember that the overall goal of ergonomic workplace and job redesign will never be accomplished by only offering "back schools" and classes on "proper lifting techniques". The focus must be on changing the job and the workplace!

### **Back Belts**

In January 2001, after a two-year study of retail workers who lift or move merchandise, the National Institute for Occupational Safety and Health (NIOSH) found no evidence that back belts reduce back injury or back pain. Among other things, the study found no statistically significant difference between the rates of back injuries among workers who wore back belts every day and back injury rates among workers who never wore back belts or wore them no more than once or twice a month.

NIOSH believes that the most effective way to prevent back injury is to implement an ergonomics program that focuses on redesigning the work environment and work tasks to reduce the hazards of lifting. Employers



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should not rely on back belts as a "cure-all" for back injuries, but should begin to undertake prevention measures which reduce risks of lifting tasks.

The Occupational Safety and Health Administration has stated, "OSHA's preferred approach to prevention of injuries and illnesses, including back injuries, is to eliminate the hazardous condition in the workplace, primarily through engineering controls. Devices such as back belts are not presently recognized by OSHA as control measures to prevent back injuries."

There are additional fears that workers will attempt to lift more than they should because of the false sense of security of wearing a belt. After all, weight lifters wear these belts and lift hundreds of pounds. However, weight lifters work up to that weight, lift under very controlled and stable conditions, and perform lifts very infrequently, with rest in between their lifts. The world of work is just not organized this way!