



Sprain and Strain Prevention

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Proper Lifting Technique

It's important to learn proper lifting techniques because lifting is one of the most common ways employees sustain back injuries (43% of all back injuries). However, lifting can also lead to strains and sprains and accounts for:

- 30% of shoulder injuries
- 22% of elbow injuries
- 13% of hand and wrist injuries*

*Source: SHARP technical report No. 40-6-2002

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Tips for Safe Lifting

- Squat down to lift the load and pull it between your legs, ensuring you are as close to the load as possible.
 - The further the load is from the center line of your body, the greater the strain imposed on your back.
- Avoid picking up heavy objects that are below knee-level.
 - Store heavy objects between knee and chest level.
- If you suspect a load is too heavy to be lifted correctly and with ease, do not attempt to lift it.
 - Use a mechanical aid or break the load down into its component parts.
 - The most common cause of back injury is overloading.
- Keep the natural arch in your lower back, which distributes the load evenly over the surface of spinal disks.
 - Keep your natural spine posture by bending at the hips and knees.
 - Avoid bending at the waist.
- Tighten your stomach muscles, which helps prevent your spine from twisting, and utilizes your stomach and lateral muscles to create hydraulic support in your abdomen.
- Stretch before doing physical work.
 - Stretching can sufficiently warm up cold and stiff muscles, reducing the risk of injury.
- Apply lifting force slowly.
- Put one knee against the load while in a squatting position.
- Visually check your intended route to ensure that there are no obstacles.
- Carry the load with your back in an upright position.

Tips for Safe Reaching

- Don't overstretch. Reach only as high as is comfortable.
- Before lifting/lowering an object, pull it close to your body.
- When reaching forward, move your whole body not just your arms.
- Use a step-stool or ladder if necessary, but stay balanced, inside of the side-rail.
- When reaching down, support your body with your free arm.
- Avoid straining to reach across a work table/bench; walk over to the load instead.
- Keep loads within arms' reach, if possible.

Tips for Safe Bending

- Maintain natural spine curvature/posture.
- Bend at the hips and knees — not at the waist.
- Always bend slowly to allow your muscles to adjust to the task.
- Use the whole palm of your hand(s) when gripping objects.
- Stretch and perform counteractive exercises to de-stress muscles.

Tips for Safe Standing

- Elevate one foot onto an object/surface to relieve lower-back stress.
- Give employees the option of sitting or standing (or rotate between the two).
- Provide a cushioning floor-mat to relieve back and leg stress.



Preventing Repetitive Motion Injuries

Repetitive motion injury involves muscles, tendons and/or ligaments. The causes of repetitive motion injuries are:

- Awkward posture for a long period of time
- Excessive force overloading muscles and tendons
- Use of the same muscles and joints over and over again to perform a repetitive task

Many repetitive motion injuries can be prevented through good design of workstations or task layouts to:

- Keep the elbows close to the body.
- Keep work within a comfortable reach distance.
- Keep work 2-4 inches below elbow height for heavy tasks.
- Keep work 8 inches below elbow height for light tasks.
- Avoid the need to rotate the wrists.
- Avoid the need to bend the wrists upward.
- Avoid the need to work with arms overhead or unsupported.
- Avoid the need to exert excessive grip force with an arm extended.
- Provide comfortable and adjustable seating.
- Provide adequate lighting and ambient temperature.
- Reduce vibration to the body.
- Minimize noise and other distractions.

Reduce Bending Motions by:

- Using lift tables, work dispensers and similar mechanical aids
- Raising the work level to an appropriate height (optimum height is between 31inches and 36 inches)
- Lowering the chair height
- Providing material at work level
- Keeping materials at work level, within arms' reach
- Providing a footrest at a workstation requiring standing
- Bending at the knees and hips, instead of at the waist

Reduce Twisting Motions by:

- Providing materials and tools in front of the worker
- Using conveyors, slides or turntables to change the direction of material flow
- Providing adjustable swivel chairs for seated workers
- Providing sufficient working space for the whole body to turn
- Using hand tools designed to keep the wrist in a neutral "in-line" position
- Use headphones instead of "cradling" a telephone between the neck and shoulder

Reduce Reaching Motions by:

- Positioning tools and machine controls close to the worker to eliminate horizontal reaches over 16 inches
- Placing materials, workplaces and other heavy objects as close as possible to the worker
- Reducing the size of cartons or pallets being loaded or making them so large that they must be mechanically handled

Reduce Manual Lifting and Lowering Forces by:

- Using lift tables, lift trucks, cranes, hoists, load counter-balances, drum/barrel dumping devices, work dispensers, elevating conveyors, etc.
- Raising/lowering the work level to maximize worker comfort and minimize reach
- Positioning worker height to allow the worker to safely exert maximum lifting force

Reduce Object Weight by:

- Reducing the size of the object (specify size to suppliers)
- Reducing the capacity of containers
- Reducing the load in the containers
- Replacing a heavier object with a lighter one of the same type
- Reducing the number of objects lifted or lowered at one time
- Decreasing object/container weight and increasing frequency of handling

Increase Object Weight to Require Mechanical Handling By:

- Using the “unit loads” (such as large bins or containers) rather than smaller totes and boxes
- Using palletized loads

Reduce the Hand Distance by:

- Changing the shape of the object
- Providing grips or handles sized for easy grip
- Providing better access to object
- Improving layout of work areas

Reduce the Distance of Push or Pull by:

- Improving layout of work area to keep tools and materials within easy reach
- Using powered trucks
- Using chutes, slides and conveyors

Reduce Force of Push or Pull by:

- Reducing the weight of an object or load
- Using conveyors, inclined chutes or slides, air bearings, ball-caster tables and monorails
- Using trucks and carts with large diameter casters/wheels
- Locating push/pull handles between 35 inches and 39 inches tall
- Providing good maintenance of floors, hand trucks, etc.
- Treating object sliding surfaces (except floors) to reduce friction
- Using air cylinders, springs or other mechanical aids to assist

Reduce Carrying Forces by:

- Converting to pushing or pulling (using racks, carts and dollies)
- Using conveyors, air-bearings, ball-casters, monorails, slides, chutes, etc.
- Using lift trucks, two-wheeled and four-wheeled trucks, dollies, etc.
- Reducing the size of the object
- Reducing the capacity of containers
- Reducing the number of objects lifted or lowered at one time

Reduce Sitting Force to Legs and Back by:

- Adjusting seat height to allow knees to be 2 inches higher than the chair seat height (feet should not dangle)
- Providing a seat size that is properly sized for thigh length (to give adequate thigh support without cutting into the back of the knees)
- Providing adjustable back rest on chair that is adjusted to support the “small” (lumbar) area of the back
- Providing workbenches and tables that are high enough to allow for comfortable leg clearance beneath
- Providing swivel and/or caster seat mobility to avoid excessive body twisting or pushing

Reduce Force to Arms and Wrists by:

- Providing hand tools designed to keep hand in line with the wrist
- Providing hand tools designed to reduce/eliminate wrist twist

- Substituting manual tools with power tools
- Providing tools designed with thumb or full hand trigger activation, instead of finger activation
- Avoiding the use of gloves that are too tight or restrictive
- Providing workstation tables and equipment surfaces that reduce pressure force against forearms and wrists, with edge-arm contact area no less than 3 inches wide

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