U.S. Department of Labor
Program Highlights
Fact Sheet No. OSHA 89-09

BACK INJURIES -- NATION'S #1 WORKPLACE SAFETY PROBLEM

Preventing back injuries is a major workplace safety challenge. According to the Bureau of Labor Statistics, more than one million workers suffer back injuries each year, and back injuries account for one of every five workplace injuries or illnesses. Further, one-fourth of all compensation indemnity claims involve back injuries, costing industry billions of dollars on top of the pain and suffering borne by employees.

Moreover, though lifting, placing, carrying, holding and lowering are involved in manual materials handling (the principal cause of compensable work injuries) the BLS survey shows that four out of five of these injuries were to the lower back, and that three out of four occurred while the employee was lifting.

No approach has been found for totally eliminating back injuries caused by lifting, though it is felt that a substantial portion can be prevented by an effective control program and ergonomic design of work tasks.

OSHA is considering ways to help employers and employees reduce these injuries. The agency requested public comments October 2, 1986 to help it develop either guidelines or regulations for manual lifting.

The agency is looking at both major categories of methods for preventing lifting injuries--administrative controls and engineering controls. The former includes carefully selecting and/or training workers so they can safely perform lifting tasks. Engineering controls attempt to redesign a job so lifting becomes less hazardous.

**Suggested administrative controls include:**

- Strength testing of existing workers, which one study showed can prevent up to one-third of work-related injuries by discouraging the assignment of workers to jobs that exceed their strength capabilities.
- Training employees to utilize lifting techniques that place minimum stress on the lower back.
- Physical conditioning or stretching programs to reduce the risk of muscle strain.

**Suggested engineering controls include:**

- A reduction in the size or weight of the object lifted. The parameters include maximum allowable
weights for a given set of task requirements; the compactness of a package; the presence of handles, and the stability of the package being handled.

- Adjusting the height of a pallet or shelf. Lifting which occurs below knee height or above shoulder height is more strenuous than lifting between these limits. Obstructions which prevent an employee's body contact with the object being lifted also generally increase the risk of injury.

- Installation of mechanical aids such as pneumatic lifts, conveyors, and/or automated materials handling equipment.

In a recent study it was determined that up to one-third of compensable back injuries could be prevented through better job design (ergonomics).

Other factors include frequency of lifting, duration of lifting activities, and type of lifting, as well as individual variables such as age, sex, body size, state of health, and general physical fitness.

The approaches suggested include the NIOSH Work Practices Guide for Manual Lifting* employing an equation using horizontal location, vertical location, vertical travel distance and lifting frequency. Another approach would put a maximum weight limit for any single lift, or a load-moment limit which would consider the effect of the distance of the load from the worker's body. Tables of maximum weights for different percentiles of male and female workers have also been proposed.

*The NIOSH (National Institute for Occupational Safety and Health) Work Practices Guide for Manual Lifting (NTIS PB 821-789-48) (Cost $17.50) is available from:

The National Technical Information Service
5285 Port Royal Road
Springfield, VA 22161

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Workplace Athletics

Proper Lifting Techniques

According to the Bureau of Labor Statistics (BLS), more than one million workers experience back injuries each year. One fourth of all workers compensation indemnity claims are a result of back injuries. Low back pain is one of the most common reason that people miss work, second only to the common cold. In America, we spend more than $100 billion annually in medical bills, disability and lost productivity at work from back injuries and illnesses. More importantly, this problem causes unnecessary discomfort and pain to workers which can have a devastating effect on their lifestyle and ability to work. A BLS survey shows that 75% of back injuries occurred while performing lifting tasks, which underscores the importance of reducing back injuries caused by lifting.

Safety First – Work Smart

Always warm-up your back and legs before performing any lifting task! We are ALL athletes in life, so we need to warm-up our body to improve performance and to reduce risk of injury. It’s important to prepare your body for work.

Low Back Rotation Stretch - Stand with hands on hips. Stabilizing the hips and legs, gently roll your upper body forward, right, backward, and left to stretch your lower back. Perform 5 slow circles gradually expanding the circle each time. Repeat in the opposite direction.

Hamstring & Achilles Stretch - Position your body with one leg forward and the toes of that foot raised up. Keep your back straight while you bend forward at the waist. You should feel a stretch in the back of your thigh and knee. Then shift your weight onto your forward leg and bend knee, keep the back leg straight and heel on floor. Hold each stretch for 20 seconds. Perform each stretch 2 times for each leg.

Before You Lift

PLAN AHEAD
- Know what you are lifting and how you will lift it.
- Be aware of the weight of the object.
- Determine whether or not it’s safe to lift on your own.
- Make sure the work area is flat, dry and clear of debris.

CHECK YOUR PATHWAY
- Make sure the lift pathway is clear.
- Remove any tripping hazards or debris.
- Check for any wet or slick surfaces.

USE ERGONOMIC EQUIPMENT
- Use lift assists, forklift, dolly, cart, hand truck or hoist.
- Make sure you are trained before using the equipment.

GET HELP WHEN NEEDED
- When lifting awkward or heavy loads, utilize a two person lift.
- Make sure you lift at the same time and keep the load level.

WEAR PROPER PPE
- Wear proper required protective shoes and gloves.
Proper Lifting Techniques

Lifting Do's and Don'ts

DO...
- Know or test the object weight.
- Use ergonomic lift assists when possible.
- Plan the lift and clear your path.
- Get help for heavy or awkward loads.
- Keep the object in the power zone.
- Use a wide stance for balance.
- Use your legs to lift.
- Pivot your feet to avoid twisting.

DON'T...
- Don't hold your breath.
- Don't bend or twist at the waist.
- Don't use a partial grip (1-2 fingers).
- Don't obstruct your vision when carrying.
- Don't jerk or lift quickly.
- Don't pinch your fingers or toes.
- Don't pull a load if you can push it.
- Don't forget to wear proper PPE.

Basic Diagonal Lifting Technique
1. Get as close to the object as possible.
2. Use a wide stance with one foot forward and to the side of the object for good balance.
3. Keep your back straight, push your buttocks out, and use your legs and hips to lower yourself down to the object.
4. Slide the object as close to you as possible.
5. Put the hand (same side of your body as the forward foot) on the side of the object furthest from you.
6. Use this basic lifting technique for small objects when you can straddle the load and use a wide stance.
7. Put the other hand on the side of the object closest to you. Your hands should be on opposite corners.
8. Grasp the object firmly with both hands.
9. Prepare for the lift, tighten your core muscles, look forward and upward, keep a straight and strong back.
10. Lift slowly and follow your head and shoulders. Hold the load close to your body. Lift by extending your legs with your back straight, and breathe out as you lift.
**Upper Body Stretches**

- **Shoulder Shrug**
  - Look straight ahead with arms relaxed at your sides.
  - Lift shoulders up toward your earlobes.
  - Take a deep breath, count to three, and exhale.
  - Roll shoulders back as you return them to their natural position.

- **Neck Stretch**
  - Look straight ahead, arms at your sides.
  - Drop your left ear toward your left shoulder. Don't raise your shoulder.
  - Take a deep breath, count to three, and exhale.
  - Return your head to an upright position. Don't roll your head forward or backward.
  - Repeat the exercise on the right.

- **Rotator Cuff Stretch**
  - Reach up and place your right hand on your upper back.
  - Place the back of your left hand in middle of your back.
  - Reach your right hand toward your left, attempting to grasp fingers together.
  - Take a deep breath, count to three, and exhale.
  - Repeat the exercise on the opposite side.

- **Back Extension Stretch**
  - Stand upright with feet shoulder-width apart.
  - Place both hands on the small of your back.
  - Lift your rib cage, arching your back.
  - Take a deep breath, count to three, and exhale.
  - Do not tip your head backward.

- **Shoulder Stretch**
  - Stand upright with your feet shoulder-width apart.
  - Clasp your hands behind your back.
  - Raise clasped hands, bending your elbows slightly until you feel a stretch.
  - Do not bend your body forward during the stretch.
  - Take a deep breath, count to three, and exhale.

**Mid Body Stretches**

- **Reach High**
  - Stand up straight with your feet shoulder-width apart.
  - Stretch your arms up over your head as high as you can.
  - Spread your fingers.
  - Take a deep breath, count to three, and exhale.

- **Wrist Curl Stretch**
  - With your arms at your sides and your knuckles forward, make loose fists.
  - Curl fists in the direction of your elbows.
  - Take a deep breath, count to three, exhale, and relax your fists.

- **Palm Press Stretch**
  - Place your palms together with fingers at chin level.
  - While keeping your palms together, press and lower your hands until you feel a stretch.
  - Be careful not to raise your shoulders.
  - Take a deep breath, count to three, exhale.

- **Side Bending Stretch**
  - Stand upright with your feet shoulder-width apart, and place your left hand on your waist.
  - Reach overhead with your right arm. Bend slightly to the left, letting the weight of your right arm create the stretch.
  - Take a deep breath, count to three, exhale, and repeat the exercise on opposite side.

- **Side Turning Stretch**
  - Stand upright with your feet shoulder-width apart and your left hand on your right hip.
  - Reach your right arm straight up from your side, then move it slightly back with your palm forward and thumb up. Look over your right shoulder at your right hand.
  - Take a deep breath, count to three, exhale, and repeat the exercise on opposite side.

- **Cat Stretch**
  - Stand with your feet shoulder-width apart. Bend down, putting your hands on slightly bent knees.
  - Look up, pointing your chin at the ceiling and creating an arch in your back.
  - Take a deep breath. As you exhale, count to three, tuck your chin into your chest, and round your back.

**Lower Body Stretches**

- **Hamstring**
  - Stand up straight, with your feet slightly apart. Slightly bend your left leg, putting hands on your left knee.
  - Extend your right leg, keeping your heel on the floor. Look straight ahead.
  - Increase stretch by bending your left knee more and pointing the toes of your right leg toward your chin.
  - Take a deep breath, count to three, exhale, and repeat the exercise on the opposite side.

- **Quad**
  - Stand up straight with your feet slightly apart.
  - Extend your left arm or use a wall for balance.
  - Grasp your right ankle with your right hand and pull upward toward your back.
  - Keep your body in good alignment with your knees fairly close together.
  - Take a deep breath, count to three, exhale, and repeat the exercise on the opposite side.

- **Calf**
  - Stand up straight with your feet slightly apart.
  - Step forward with your left foot. Bend and put both hands on your left knee.
  - Bend your right leg, leaning slightly forward and keeping both feet flat on the floor.
  - Take a deep breath, count to three, exhale, and repeat the exercise on the opposite side.