

LIFTING AND BACK SAFETY TRAINING LESSON PLAN

Topic: Back Safety and Proper Lifting Techniques

This presentation is designed to assist trainers conducting Lifting and Back Safety training for workers. Back injuries are considered by OSHA to be the nation's #1 workplace safety problem. The training will cover strategies that help you reduce musculoskeletal disorders (MSDs). The overall goal is to create greater understanding of the importance of basic ergonomics principles related to back care and how to properly lift objects.

Since workers are the target audience, this presentation emphasizes hazard identification, avoidance, and control – not standards. No attempt has been made to treat the topic exhaustively. It is essential that trainers tailor their presentations to the needs and understanding of their audience. This presentation is not a substitute for any of the provisions of the Occupational Safety and Health Act of 1970 or for any standards issued by the U.S. Department of Labor.

Overview of the OSHA Standard

No Standards exist with respect to back safety or other ergonomic hazards per se. Under the OSH Act, the extent of an employer's obligation to address ergonomic hazards is governed by the general duty clause. 29 U.S.C. 654(a)(1). OSHA is proposing an ergonomics program standard to address the significant risk of work-related musculoskeletal disorders (MSDs) confronting employees in various jobs in general industry workplaces. General industry employers covered by the standard would be required to establish an ergonomics program containing some or all of the elements typical of successful ergonomics programs: management leadership and employee participation, job hazard analysis and control, hazard information and reporting, training, MSD management, and program evaluation, depending on the types of jobs in their workplace and whether a musculoskeletal disorder covered by the standard has occurred. The proposed standard would require all general industry employers whose employees perform manufacturing or manual handling jobs to implement a basic ergonomics program in those jobs.

Instructional Materials

1. PowerPoint presentation
2. Instructor notes
3. Training participant roster
4. Teaching Outline
5. OSHA references

Learning Objectives and Expected Outcomes

Upon completion of the lesson, participants should be able to:

1. Describe the two common types of back injuries
2. Identify the key contributing factors to back injuries
3. Describe the common disc degeneration factors and the stages of disc degeneration
4. Describe the common causes of back injuries
5. Demonstrate proper lifting techniques and list steps in the Lifting Safety Checklist
6. Discuss the three primary areas of back injury prevention.



Teaching Outline

1. Opening Slide / Introduction
2. Learning Objectives
3. Introduction
 - a. More than 1 million workers suffer back injuries each year, accounting for more than 20% of all workplace injuries or illnesses.
 - b. One fourth of all compensation claims involve back injuries, which cost employers billions of dollars
 - c. Second most common reason for doctor visits among U.S. citizens, according to the National Center for Health Statistics.
 - d. Two common classes of back injuries are:
 - i. "Soft tissue" injuries involving muscle or ligament
 - ii. Injuries to the spinal disks
4. Spinal Anatomy 101
 - a. Ligaments hold the spine's vertebrae together
 - b. Muscles are attached to the vertebrae by bands of tissue called tendons
 - c. Between each vertebra is a cushion known as a disc
 - d. Openings in each vertebra line up to form a long, hollow canal
 - e. The spinal cord runs through this canal from the base of the brain
 - f. Nerves from the spinal cord branch out and leave the spine through the spaces between the vertebra
 - g. The lower part of the back holds most of the body's weight
5. Spinal Anatomy 101 - Intervertebral Discs
 - a. The vertebrae are separated by Intervertebral **discs** which act as cushions between the bones.
 - b. Each disc is made up of two parts - the hard, tough outer layer called the **annulus** surrounds a mushy, moist center termed the **nucleus**.
6. Disc Degeneration Factors
 - a. Many factors increase the risk of disc degeneration...
 - i. Lifestyle choices such as:
 - ii. Lack of regular exercise
 - iii. Inadequate nutrition
 - iv. Obesity
 - v. Drug and tobacco
 - vi. Natural biochemical changes occurring with age cause discs to gradually dry out affecting disc strength and resiliency
 - vii. Poor posture
 - viii. Habitual use of incorrect body mechanics
7. Stages of Disc Degeneration
 - a. Disc Degeneration: chemical changes associated with aging causes discs to weaken, but without a herniation.
 - b. Prolapse: the position of the disc changes with some slight impingement into the spinal canal. Also called a bulge or protrusion.



- c. Extrusion: the gel-like nucleus pulposus breaks through the tire-like wall (annulus fibrosus) but remains within the disc.
 - d. Sequestration: the nucleus pulposus breaks through the annulus fibrosus and lies outside the disc in the spinal canal (HNP).
8. Physical Stress on Skeletal System
- a. The Forces Involved: Imagine your back as a lever. With the fulcrum in the center of the lever, how many pounds would it take to lift a 10-pound object?
9. Physical Stress on Skeletal System
- a. The Forces Involved: It takes 10 pounds of pressure to lift a 10-pound object.
 - b. Will it take more or less force to lift the same 10-pound object with the fulcrum shifted away from the object?
10. Physical Stress on Skeletal System
- a. The Forces Involved: With the fulcrum shifted away from the object, it takes more force to lift the object.
 - b. The human back operates on a 10:1 lifting ratio, with the waist acting as the fulcrum.
11. Physical Stress on Skeletal System
- a. The Forces Involved: When you add in the 105 pounds of the average human upper torso, lifting a 10-pound object puts 1,150 pounds of pressure on the human back.
12. Physical Stress on Skeletal System
- a. The Forces Involved: If you were 25 pounds overweight, it would put an additional 250 pounds of pressure on your back every time you bend over
13. Common Causes of Back Injuries
- a. Heavy lifting...especially repetitive lifting over a long period of time...
 - b. Twisting at the waist...while lifting or holding a heavy load...
 - c. Reaching and lifting...over your head, across a table, or out the back of a truck...
 - d. Working in odd, uncomfortable positions...tasks that require you to bend over for long periods of time...
 - e. Sitting or standing too long in one position...sitting can be very hard on the lower back...
 - f. Slips, trips and falls
14. Other Common Causes
- a. Some people suffer back pain because they sleep in a bad position, or because their mattress is too soft. What is the best sleep position for your back?
 - i. On your stomach or back with legs level.
 - ii. On your side with knees slightly bent.
 - iii. On your back with a pillow under your knees.
15. Preventing Back Injuries
- a. Avoid lifting and bending whenever you can....
 - b. Place objects up off the floor so you won't have to reach down to get them
 - c. Always use a dolly or a forklift if you can
 - d. If you must lift, the best zone for lifting is between your shoulders and your waist
 - e. Pushing an object is better than pulling the object
 - f. Don't overdo it - if you have to strain to carry the load, it's too heavy for you
 - g. Make sure you have enough room to lift safely



- h. Look around before you lift and know where you are going to put down the load
 - i. Avoid walking on slippery and uneven surfaces while carrying something
16. Preventing Back Injuries - Use proper lifting procedure
- a. Plan your move
 - i. Size up the load and make sure your path is clear.
 - ii. Get help as needed
 - iii. Use handles or straps
 - iv. Use a dolly or other materials handling equipment if possible.
 - b. Use a wide, balanced stance with one foot slightly ahead of the other and with your heels on the floor
 - c. Get as close to the load as possible
 - d. Use your palms, not just your fingers to grasp the load
 - e. Tighten your stomach muscles as the lift begins
 - f. Keep your lower back in its normal arched position
 - g. Pivot to turn - Don't twist your back
 - h. Lower the load slowly, maintaining the curve in your lower back
17. Preventing Back Injuries - More Lifting Tips
- a. Transferring weight
 - i. Pull object towards you while transferring your weight to the lift side
 - ii. Lift only to the level required
 - iii. Shift your weight to the other leg while pushing the object into position.
 - iv. Do not twist
 - b. Lifting heavy bags
 - i. Put one knee down against bag
 - ii. Pull bag up leg
 - iii. Rest bag on edge of knee
 - iv. Stand upright
 - v. Pull bag to waist height
18. Preventing Back Injuries - Lifting Safety Check List
- a. Have you checked the object before you try to lift it?
 - i. Test every load before you lift by pushing the object lightly with your hands or feet to see how easily it moves.
 - ii. Remember, a small size does not always mean a light load
 - b. Is the load you want to lift packed right?
 - i. Make sure the weight is balanced and packed so it won't move around
 - ii. Loose pieces inside a box can cause accidents if the box becomes unbalanced
 - c. Is it easy to grip this load?
 - i. You can be injured if you arch your back when lifting a load over your head
 - ii. To avoid hurting your back, use a ladder when you're lifting something over your head
19. Prevent Back Injuries - Body Management
- a. Stretch early and stretch often



- b. Slow down; don't overdue it
- c. Take frequent micro breaks
- d. Sleep on a firm mattress
- e. Get in shape and stay in shape with regular exercise

20. Summary

- a. Back injuries are the leading cause of disability accounting for more than 20% of all workers comp claims
- b. Every time you bend over, lift a heavy object, or sit leaning forward, you put stress on your spine
- c. Two common types of back injuries are soft tissue and injuries to the intervertebral spinal discs
- d. Over time, the discs between your vertebrae can start to wear out and become damaged
- e. Factors contributing to back injuries include poor physical condition, poor posture, excessive weight and stress
- f. The lift safety check includes checking the object before you lift, determining if it is packed correctly and insuring a proper grip
- g. Proper lifting technique includes planning the move, using a wide, balanced stance, getting as close to the load as possible and pivoting your feet versus twisting
- h. Ergonomic hazard control strategies include engineering controls, management controls and personal protective equipment

References

1. OSHA Guidelines

- a. Proposed Ergonomics Program FAQs
<http://www.osha.gov/SLTC/ergonomics/faqs.html#Guidelines>

2. OSHA References/Resources

- a. Back Safety Report
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=FACT_SHEETS&p_id=146
- b. OSHA Technical Manual: Back Disorders and Injuries
http://www.osha.gov/dts/osta/otm/otm_vii/otm_vii_1.html

