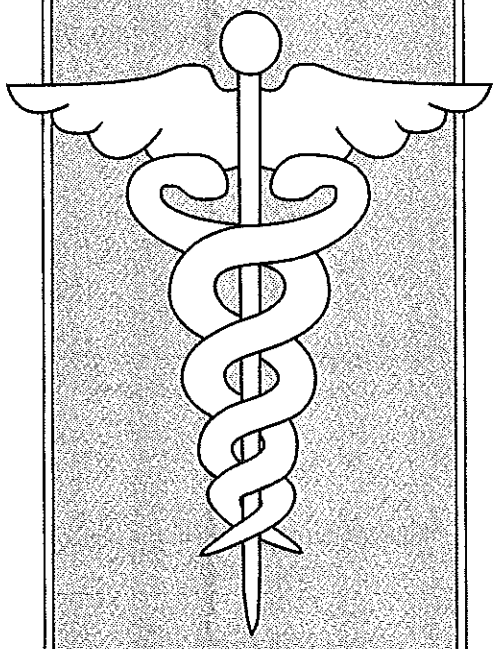
Long Term Care Network,
A Division of
PRIMEDIA Healthcare

# Body Mechanics: Protecting Yourself

## EDA 311-0165



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## INTRODUCTION

More than 10 million people each year seek treatment for low back pain at a cost of more than $50 billion (Schenk et al., 1996). Healthcare workers are at significant risk for back injuries due to the amount of manual lifting that is required in their jobs. This program's presenter discusses techniques used in a healthcare environment to lower the risk of back injury.

## TARGET AUDIENCE

The target audience for this activity is certified nursing assistants.

## LEARNING OBJECTIVES

After completing this activity, the participant should be able to:

1. identify the three normal curves of the spine.
2. identify three risk factors for developing back pain.
3. describe the components of the safest lifting technique.
4. demonstrate three basic exercises that can be done to lower the risk of back injury.

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This syllabus is designed to be used in conjunction with video program EDA 311-0165 by the Long Term Care Network, a division of PRIMEDIA Healthcare. PRIMEDIA Healthcare is a division of PRIMEDIA Workplace Learning.

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# BODY MECHANICS: PROTECTING YOURSELF

Back pain has become a serious problem among healthcare workers. It is most commonly associated with heavy lifting or awkward lifting conditions. Ninety percent of adults have back pain during their lives (Blue, 1996). Prevention of back pain is more cost effective than treatment after the injury has occurred (Neal, 1997).

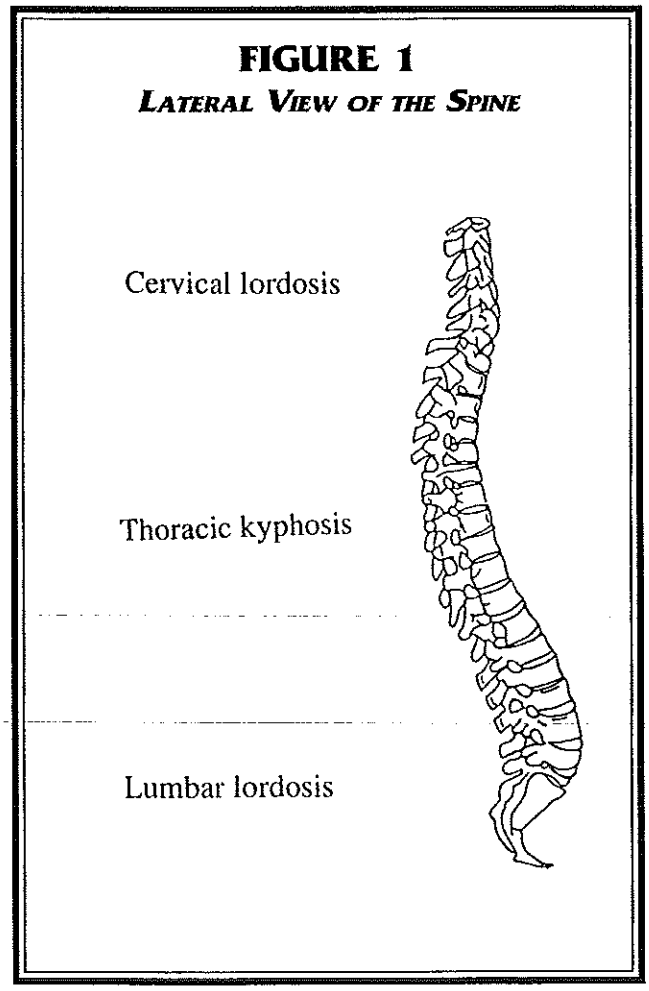
## ANATOMY

The three normal curves of the spine are the:

- cervical curve.
- thoracic curve.
- lumbar curve.

**FIGURE 1**

***LATERAL VIEW OF THE SPINE***




Healthy posture occurs when the three natural curves are aligned so that the weight of the body is centered over the base of support (the feet). When this occurs, the body is balanced and protected from injury (Blue, 1996).

## RISK FACTORS

Risk factors for developing back pain include (Blue, 1996):

- poor body mechanics.
- lifting or moving objects of excessive weight or asymmetric size.
- prolonged sitting with poor posture.
- poor work surfaces.

A state of general deconditioning is also a risk factor for back pain. Physically fit people have a lower percentage of back injuries (Gassett et al., 1996). Exercise regularly to maintain good physical fitness.

Healthcare workers often have to work in awkward positions or work standing with their arms outstretched and their trunks leaning forward (Blue, 1996). Using proper posture, correct body mechanics, and safe lifting techniques are the most effective ways of preventing injury.

## STANDING POSTURE

When standing, keep the body in neutral alignment, maintaining the natural curves of the spine. Place the feet shoulder-width apart to provide a strong base of support. If prolonged standing is necessary, place a small footstool under one foot to relieve stress on the low back (Neal, 1997).

## LIFTING TECHNIQUES

Use the muscles of the legs, arms, and abdomen to reduce stress on the low back. Begin lifting with the object or resident at a height or level between your knuckles and shoulder (when your arm is hanging at your side). For example, before working with a resident in bed, raise the bed to your waist level so you do not have to bend forward. Lifting outside of this area causes excessive compression forces to the discs and back muscles.

Use a step stool when you are attempting to reach above shoulder level, and bend your knees when reaching below your knuckle level. Take time to plan before you lift. Determine the safest, most effective method for lifting. If you have doubts that you will be able to lift the object or resident by yourself, ask for help or use a mechanical lift. Do not attempt a lift unless you are confident that you can do it safely.

Explain to the resident what you are planning to do and how he or she can help. The resident may be able to offer suggestions based on prior experience. Get a good grip on the resident; use a gait belt or sheet to assist with resident lifts. Bring the object or resident as close to your body as possible. This allows the weight to be close to the center of gravity over the base of support (the feet). Maintain a wide base of support with your feet pointing in the direction of the movement. Move the object or resident in a straight line. Avoid twisting or bending the back to the side (Blue, 1996). If you must turn to lower the object or resident, move your feet in the direction that you are going, but do not twist your back.

## PUSHING VS. PULLING

Pushing is less detrimental to the low back than pulling. Keep the object close to your body. If the object has a handle, the optimal height of the handle is 35 to 45 inches from the floor.

## PHYSICAL FITNESS

Healthcare workers who have good cardiopulmonary fitness are less likely to have muscular fatigue and are less susceptible to injury. Ten minutes of stretching prior to work can decrease the likelihood of injury (Blue, 1996). Three exercise figures appear in Addendum 1.

## SUMMARY

By maintaining physical fitness and following the techniques for correct posture and body mechanics, you can greatly reduce the risk of low back injury in the workplace (Blue, 1996).

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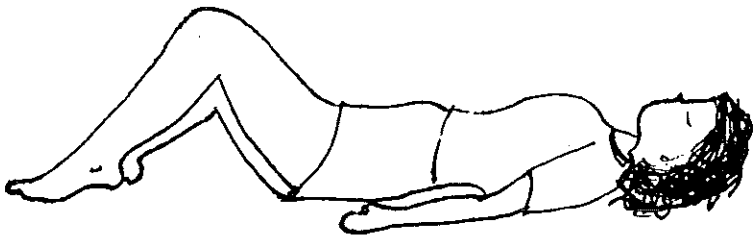
# ADDENDUM 1

## *Exercise Figures*

Three exercises that can be done include:

1. **The posterior pelvic tilt**—This exercise increases endurance and strength of the gluteal and abdominal muscles.



**Lying PelvicTilt**

**Purpose:** To strengthen abdominal and gluteal muscles and improve pelvic-back rhythm.

Description: Lie on your back with knees bent and arms at your sides. Rotate your pelvis by tightening the abdominal muscles until your lower back touches the floor. Raise the lower gluteal area slightly off the floor. Hold the position two to five seconds. Relax. Repeat the exercise 15-20 times.

Comments: Keep feet flat on the floor.

2. **The hamstring stretch**—This helps keep the hamstring muscles flexible and allows the natural lordosis of the lumbar spine. Tight hamstring muscles can limit lumbar spine range of motion.

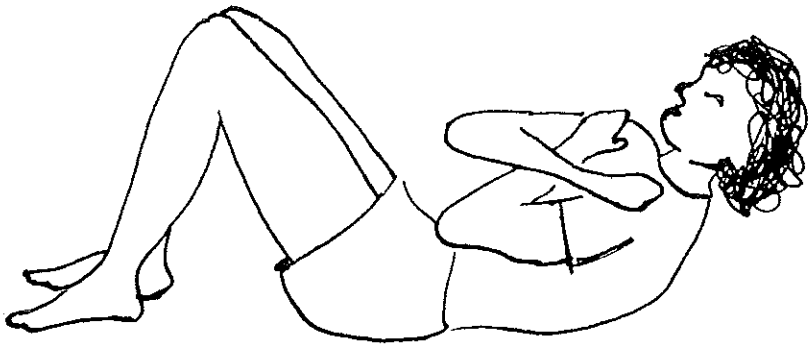
**Modified Hurdler**

**Purpose:** To stretch the lower back, hip, and hamstring muscles.

Description: Sit on the floor with left leg outstretched. Bend at the waist, and lower your upper torso onto your outstretched thigh. Reach toward the foot of your outstretched leg with both hands. Hold position for 15 seconds. Sit upright. Repeat five times. Repeat on the other side.

Comments: Place foot on inside of straight leg to form a 90-degree angle between your extended leg and flexed leg.

3. **The abdominal curl**—This helps strengthen the abdominal muscles which help protect the spine during bending and lifting.



**Abdominal Curl**

**Purpose:** To strengthen abdominal muscles.

Description: Lie on your back with both knees bent, feet flat on the floor, and hands resting on your chest. Slowly raise your head and shoulders from the floor. Hold the position for as long as you can, from 10-60 seconds. Repeat the exercise 5 to 10 times.

# POST TEST

# BODY MECHANICS: PROTECTING YOURSELF

1. Which is a normal spinal curve?
   a. Cervical
   b. Lumbar
   c. Thoracic
   d. All of the above

2. Which is a/are risk factor(s) for developing back pain?
   a. Lifting objects of excessive weight
   b. Poor body mechanics
   c. Prolonged sitting with poor posture
   d. All of the above

3. Which is a component of correct standing posture?
   a. Placing feet shoulder-width apart
   b. Placing feet close together
   c. Crossing arms across chest
   d. Keeping hands behind back

4. When lifting, it is safest to use which muscle groups?
   a. Legs, arms, and back
   b. Back, abdomen, and arms
   c. Legs, arms, and abdomen
   d. Abdomen, back, and legs

5. When lifting a resident, you should do which?
   a. Explain to the resident what you are planning to do
   b. Hold onto the resident's clothes
   c. Turn your feet in the direction opposite of where you are moving
   d. Keep your feet close together

6. The optimal height of a pushing handle is:
   a. 20-25 inches from the floor.
   b. 30-35 inches from the floor.
   c. 35-45 inches from the floor.
   d. 25-35 inches from the floor.

7. Which stretch(es)/exercise(s) reduce(s) the risk of back injury?
   a. Posterior pelvic tilt
   b. Abdominal curls
   c. Hamstring stretches
   d. All of the above

8. The base of support for a standing person is the:
   a. knees.
   b. legs.
   c. feet.
   d. back.

9. When working with a resident who is lying in bed, you should:
   a. put the bed at your waist level.
   b. put the bed as high as it goes.
   c. put the bed as low as it goes.
   d. put the bed below your knuckle level when you are standing with your hands at your sides.

10. When moving a resident, which can be used to assist you?
    a. The resident's clothes
    b. The bed sheet
    c. A gait belt
    d. b and c

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