



OSHA Technical Manual

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SECTION VII: CHAPTER 1

BACK DISORDERS AND INJURIES

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I. INTRODUCTION

- A. **GENERAL.** Back disorders can develop gradually as a result of microtrauma brought about by repetitive activity over time or can be the product of a single traumatic event. Because of the slow and progressive onset of this internal injury, the condition is often ignored until the symptoms become acute, often resulting in disabling injury. Acute back injuries can be the immediate result of improper lifting techniques and/or lifting loads that are too heavy for the back to support. **While the acute injury may seem to be caused by a single well-defined incident, the real cause is often a combined interaction of the observed stressor coupled with years of weakening of the musculoskeletal support mechanism by repetitive micro-trauma.** Injuries can arise in muscle, ligament, vertebrae, and discs, either singly or in combination.
- B. **INCIDENCE.** Although back injuries account for no work-related deaths, they do account for a significant amount of human suffering, loss of productivity, and economic burden on compensation systems. **Back disorders are one of the leading causes of disability for people in their working years and afflict over 600,000 employees each year with a cost of about \$50 billion annually in 1991 according to NIOSH.** The frequency and economic impact of back injuries and disorders on the work force are expected to increase over the next several decades as the average age of the work force increases and medical costs go up.

II. BACK DISORDERS.

- A. **FACTORS ASSOCIATED WITH BACK DISORDERS.** Back disorders result from exceeding the capability of the muscles, tendons, discs, or the cumulative effect of several contributors:
- **Reaching while lifting.**
 - Poor posture--how one sits or stands.
 - Stressful living and working activities--staying in one position for too long.
 - Bad body mechanics--how one lifts, pushes, pulls, or carries objects.
 - Poor physical condition--losing the strength and endurance to perform physical tasks without strain.
 - Poor design of job or work station.
 - Repetitive lifting of awkward items, equipment, or (in health-care facilities) patients.
 - **Twisting while lifting.**
 - Bending while lifting.
 - Maintaining bent postures.
 - **Heavy lifting.**
 - Fatigue.
 - Poor footing such as slippery floors, or constrained posture.
 - Lifting with forceful movement.
 - Vibration, such as with lift truck drivers, delivery drivers, etc.
- B. **SIGNS AND SYMPTOMS.** Signs and symptoms include pain when attempting to assume normal posture, decreased mobility, and pain when standing or rising from a seated position.

III. REPORTS OF BACK INJURIES.

A. **CONTRIBUTING FACTORS.** These factors usually account for very few work-related back injuries.

- Congenital defects of the spine.
- Increase in static standing or sitting tasks.
- An aging work force.
- Decreases in physical conditioning and exercise.
- Increased awareness of workplace hazards.
- Job dissatisfaction.

B. **MANUAL MATERIALS HANDLING** Manual materials handling is the principal source of compensable injuries in the American work force, and four out of five of these injuries will affect the lower back.

IV. INVESTIGATION GUIDELINES.

A. RECORDS REVIEW: OSHA 200 LOG.

1. Note when back or other musculoskeletal disorders appear excessive from Lost Work Day Injury and Illness (LWDII) rate calculations. Understand that excessiveness is relative, since there is no firm figure established that delineates safe from unsafe. A better measure is to look for trends of escalating number of injuries or of increasing severity of injuries. Comparing your target population with BLS data, other company rates, other lines, departments, wings, or occupational titles can yield a meaningful measuring point to gauge excessiveness.

Back injuries should be treated as an injury on the OSHA 200 log regardless of whether the injury was the result of an acute or chronic exposure.

2. To determine if trends exist, at least several years of the OSHA 200 log will be needed for review.
3. Record or copy information, including occupational titles, departments, dates of injury or illness, from the OSHA 200 log and pertinent OSHA 101 (or equivalent). This information can be used to calculate the LWDII and Severity rates (see [Appendix VII:1-1](#)).
4. If you determine that there is a need for a more in-depth analysis of the extent and magnitude of the back disorders, see [Appendix VII:1-1](#).

B. EMPLOYER, EMPLOYEE INTERVIEWS.

1. Walkaround.

- a. Ask employees about their opinion on the difficulty of the task as well as personal experiences of back pain.
- b. Observe worker postures and lifting.
- c. Determine weight of objects lifted.
- d. Determine the frequency and duration of lifting tasks.
- e. Measure the dimensions of the workplace and lift.

2. Evaluation.

- a. Videotapes should be taken of the work task for later review and for evidence of recognized musculoskeletal hazards (see [Appendix VII:1-3](#)).
- b. Manual lifting:
 - Repetitive material handling increases the likelihood of a disorder.
 - Principal variables in evaluating manual lifting tasks to determine how heavy a load can be lifted are: the horizontal distance from the load to the employee's spine, the vertical distance through which the load is handled, the amount of trunk twisting the employee utilized during the lifting, the ability of the hand to grasp the load, and the frequency with which the load is handled.
 - Additional variables include floor and shoe traction, space constraints, two-handed lifts, size and stability of the load.
 - The NIOSH Lifting Formula uses the principal variables to compute a theoretically safe lift.

For more information, please visit - www.osha.gov/dts/osta/otm/otm_vii/otm_vii_1.html

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