All healthcare workers who lift and move patients are at high risk for back injury and other musculoskeletal disorders (MSDs). This course is geared towards the employee and will take a closer look at ways they can help prevent MSDs in their profession. It will also provide mechanical techniques to protect them from injuries when lifting and transferring patients.
OSHAcademy Course 623 Study Guide

Healthcare: Preventing Ergonomic Injuries

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Contact OSHAcademy to arrange for use as a training document.

This study guide is designed to be reviewed off-line as a tool for preparation to successfully complete OSHAcademy Course 623.

Read each module, answer the quiz questions, and submit the quiz questions online through the course webpage. You can print the post-quiz response screen which will contain the correct answers to the questions.

The final exam will consist of questions developed from the course content and module quizzes.

We hope you enjoy the course and if you have any questions, feel free to email or call:

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Course Introduction

All healthcare workers who lift and move patients are at high risk for back injury and other musculoskeletal disorders. A work-related musculoskeletal disorder (MSD) is an injury of the muscles, tendons, ligaments, nerves, joints, cartilage, bones, or blood vessels in the arms, legs, head, neck, or back that is caused or aggravated by work tasks such as lifting, pushing, and pulling.

Symptoms include:

- pain
- stiffness
- swelling
- numbness
- tingling

This course will take a closer look at ways employees can help prevent MSDs in their profession. It will also provide mechanical techniques to protect them from injuries when lifting and transferring patients.
Module 1: Safety and Health Program

Introduction

Ergonomics is the science of fitting the job to the worker. When there is a mismatch between the physical requirements of the job and the physical capacity of the worker, work-related musculoskeletal disorders (MSDs) can result.

Ergonomics provides a means for adjusting the work environment and work practices to prevent injuries before they occur. Health care facilities have been identified as an environment where ergonomic stressors exist.

Quiz Instructions

After each section, there is a quiz question. Make sure to read the material in each section to discover the correct answer to these questions. Circle the correct answer. When finished, go online to take the final exam. This exam is open book, so you can use this study guide.

1. Ergonomics is the science of fitting the _____ to the _____.
   a. job, worker
   b. position, location
   c. qualifications, worker
   d. job, position

Ergonomic Injuries

Employees can suffer ergonomic injuries during the handling, transferring, and positioning of patients.

Patient handling tasks pose increased ergonomic risk if they are:

- repetitive (e.g., repeatedly cranking manual adjustments for beds)
- done in awkward postures (e.g., reaching across beds to lift patients)
- done using a great deal of force (e.g., pushing chairs or gurneys across elevation changes or up ramps)
- lifting heavy objects (e.g., manually lifting immobile patients alone)
2. Patient handling tasks pose increased ergonomic risks if they are _____.
   a. easy
   b. not repetitive
   c. done using a great deal of force
   d. hard

Other Hazards

Other hazards include:

- overexertion
- trying to stop a patient from falling or picking patient/residents up from floor or bed
- multiple lifts per shift (more than 20)
- lifting alone, no available staff to help
- lifting un-cooperative, confused patients
- lifting patients who cannot support their own weight
- patient weight (bariatric patients)
- expecting employees to perform work beyond their physical capabilities
- distance to be moved, and the distance the patient is from the employee (it is more stressful to reach away from the body to lift or pull a patient)
- awkward postures required by the activity
- ineffective training of employees in body mechanics and proper lifting techniques

3. _______ is another hazard that can cause ergonomic injuries in healthcare workers.
   a. Running
   b. Overexertion
   c. Eating lunch
   d. Talking on the phone
**Potential Hazards**

Employee exposure to work related MSDs from ergonomic stressors that have not been effectively identified and addressed in a safety and health program could be a potentially hazardous situation.

Many patients, especially nursing home residents, are totally dependent on staff members to provide activities of daily living, such as dressing, bathing, feeding, and toileting. Each of these activities involve multiple interactions with handling or transferring of patients and could result in employee injuries. Employee injuries lead to increased injury costs, higher turnover rates, increased sick and/or injured days, and staffing shortages.

**Possible Solutions**

OSHA recommends minimizing the manual lifting of patients in all cases. Employees should eliminate lifting whenever possible. Employers should also identify and address ergonomic stressors in their facility’s safety and health plan.

Areas that should be addressed a facility's safety and health program include:

- management leadership/employee participation
- workplace analysis
- accident and record analysis
- hazard prevention and control
- medical management
- training

Let’s take a closer look at each of these components.

4. OSHA recommends minimizing the manual lifting of patients in _____ cases.
   
   a. 50% of
   b. majority of
   c. all
   d. minimum of
Management Leadership

Management leadership should demonstrate a commitment to reduce or eliminate patient handling hazards through establishing a written program that addresses issues, such as:

- continued training of employees in injury prevention
- methods of transfer and lifting to be used by all staff
- compliance with transfer and lift procedures
- procedures for reporting early signs and symptoms of back pain and other musculoskeletal injuries

Employee Participation

Employee participation should include:

- complaint/suggestion program which includes employee reports of unsafe working conditions
- prompt reporting of signs and symptoms as well as injuries

5. Management leadership should demonstrate a commitment to ______ patient handling hazards through establishing a written program.
   a. reduce  
   b. increase  
   c. prevent  
   d. allow

Workplace Analysis

Employers should conduct an analysis of the workplace to identify existing and potential workplace hazards and find ways to correct these hazards.

Assessment of work tasks involves:

- examination of duration
- frequency
- magnitude of exposure to ergonomic stressors such as force, repetition, awkward postures, vibration and contact stress to determine if employees are at risk of pain or injury

Observation, workplace walkthroughs, talking with employees and periodic screening surveys are used to help identify hazards such as stressful tasks.

6. Employers should conduct an analysis of the workplace to identify which of the following workplace hazards?
   a. Frequency
   b. Prompt reporting of signs and symptoms as well as injuries
   c. Accurate injury and illness recording
   d. Extent of injuries

Accident and Record Analysis

OSHA issued a revised Recordkeeping Rule to improve the system employers use to track and record workplace injuries and illnesses. Final rule became effective on Jan. 1, 2002.

Potential Hazard

Without proper recordkeeping, illness and injury trends would go unreported and unstudied and valuable information about causes and possible prevention of injuries would be lost.

Possible Solutions

- Follow the OSHA Recordkeeping Standard.

- Employers must record each fatality, injury or illness that:
  - is work related
  - is a new case
  - meets one or more of the criteria contained in sections 29 CFR 1904.7 through 1904.12 of the regulation

- Exposure to ergonomic stressors in healthcare workplaces can result in a variety of disorders in affected workers referred to as musculoskeletal disorders (MSDs). MSDs may develop gradually over time or may result from instantaneous events such as a single heavy lift. These conditions will be classified on recordkeeping forms as either
injuries or illnesses. It is critical for recording keeping data to be kept accurately and that employers do not under report these events.

For more on recordkeeping basics, please check out OSHAcademy course 708-OSHA Recordkeeping Basics.

7. Employers must record each fatality, injury, or illness that is _____ and _____.
   a. not work related, old case
   b. serious, dangerous
   c. work-related, old case
   d. work-related, new case

Hazard Prevention and Control

This includes implementing administrative and engineering controls to help prevent ergonomic injuries.

Administrative controls: These are typically rules or procedures established by management to decrease the likelihood of an injury. For example, providing for adequate staffing, assessment of patient needs and restricted admittance policies.

Engineering controls: Help to isolate or remove the hazard from the workplace. Providing proper selection, training, and use of assist devices or equipment are all examples of engineering controls.

Medical Management

A medical management program, supervised by a person trained in the prevention of musculoskeletal disorders, should be in place to manage the care of those injured. The program should include:

• accurate injury and illness recording
• early identification and treatment of injured employees
• "light duty" or "no lifting" work restrictions during recovery periods
• systematic monitoring of injured employees to identify when they are ready to return to regular duty
8. These are typically rules or procedures established by management to decrease the likelihood of an injury.

a. Administrative controls  
b. Engineering controls  
c. Workplace analysis  
d. Hazard prevention

Training

A training program, designed and implemented by qualified persons, should be in place to provide continual education and training about ergonomic hazards and controls to managers, supervisors and all healthcare providers, including "new employee" orientation.

Training should be updated and presented to employees as changes occur at the workplace, and be at a level of understanding appropriate for those individuals being trained, and should also include:

- The opportunity to ask questions of the trainer.
- An overview of the potential risks, causes, and symptoms of back injury and other injuries. Be able to identify existing ergonomic stressors and methods of control, such as the use of engineering, administrative, and work practice controls particularly safe resident handling techniques.
- Recognizing the signs and symptoms of MSDs and the procedures for reporting potential problems.
- Encouragement of staff physical fitness.
- Lifting guidelines for health care workers (nurse assistants, licensed practical nurses, registered nurses) which should include:
  - Never transfer patients when off balance.
  - Lift loads close to the body.
  - Never lift alone, particularly fallen patients, use team lifts or use mechanical assistance.
  - Limit the number of allowed lifts per worker per day.
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- Avoid heavy lifting especially with spine rotated.
- Training in when and how to use mechanical assistance.

9. A training program should be implemented by _____.
   a. management
   b. employees
   c. qualified persons
   d. unqualified persons

Success with Ergonomics-Case Study

Borderview Rehabilitation and Living Center in Maine reduced musculoskeletal injury rates through an ergonomics program. The program involved employee participation and feedback, workstation and equipment modifications, and reassessment of the changes that are made.

Let’s take a closer look at the problem and how management, along with employees, fixed the issue.

The Problem

All 153 employees were trained in proper body mechanics for job-related tasks; however, several back injuries were still being reported over a short period of time.

The Solution

The company already had annual department-specific “back care” training in place to teach employees about proper body mechanics. After the numerous back injuries were reported, Borderview developed and implemented a program of separate analysis of the jobs in each department. As part of the job task analyses, the employees also completed a questionnaire where they could voice their concerns and comments. With input from the employees, the department heads worked with an ergonomics team to modify tasks and/or change the work environment and/or equipment.

After the changes were made, management consulted employees to determine if the changes were effective or if additional modifications were needed. Employees also participated in exercise programs designed by the company’s physical therapists to increase strength and reduce the likelihood of injury.
The Impact

The company had three times achieved its goal of 100 consecutive days with a lost-time injury.

Caring for Caregivers

A Missouri health-care foundation is teaching its workers to look out for their own health and safety as well as their residents’. Read more here.
Module 2: Patient Handling Controls

Introduction

Hospital health care workers (especially nursing assistants, who do a majority of the lifting in many facilities) may develop musculoskeletal injuries such as muscle and ligament strain and tears, joint and tendon inflammation, pinched nerves, herniated discs and others from patient handling.

Good work practice includes continually identifying the most hazardous tasks and implementing engineering and work practice controls to help reduce or prevent injuries in those tasks.

Employers must provide employees with proper assist devices and equipment to reduce excessive lifting hazards.

The proper equipment selection depends on the specific needs of the facility, patients, staff, and management.

1. A training program should be implemented by _____.
   a. management
   b. employees
   c. qualified persons
   d. unqualified persons

Bathing Assistance

Devices such as shower chairs can fit over the toilet. Using this device can eliminate multiple transfers, which prevents health care workers from having to lift patients several times. A patient can be moved to the shower chair, toileted, showered, and transferred back to the wheelchair. Shower stalls allow for shower chairs to be pushed in and out on level floor surfaces.

Shower Chairs: These can eliminate multiple transfers, saving health care workers having to do multiple lifts.

Shower Gurney: These are used for bathing non-weight bearing patients. The cart can be raised to eliminate bending and reaching to the caregiver.

Adjustable Bathtubs: These are used to bath patients who sit directly in the bathtub. They are also used to assist ambulatory patients.
2. Use these for bathing non-weight bearing patients.

   a. Shower gurney
   b. Shower chair
   c. Adjustable bathtub
   d. Trapeze lifts

Toileting Assistance

Toilet seat risers are used on toilets to equalize the height of wheelchair and toilet seat, making it a lateral transfer rather than a lift up and back into wheelchair.

Mechanical Lift Equipment

There are several types of equipment to help lift patients who cannot support their own weight. You should choose a lift that does not require manual pumping to avoid a possible repetitive motion disorders to workers’ arms or shoulders.

3. When should a caregiver use a toilet seat riser to help patients?

   a. To equalize the height of the wheelchair and toilet seat
   b. To move non-weight bearing patients
   c. To lower the toilet seat
   d. To move patients from their bed to wheelchair

Overhead track mounted patient lifters: A track system built into the ceiling that sling lifts attach to. This system provides patient mobility from room to room without manual lifting.

Lateral transfer devices: Devices used to laterally transfer a patient (for example from bed to gurney). They usually involve multiple staff members to help do the lifting. This is often done with the help of a draw sheet, or similar device. Some new lateral transfer systems do not require any lifting by staff and are totally mechanical. This type of device helps prevent staff back injuries.
4. What type of lift equipment provides patient mobility from room to room without manually lifting?
   a. Lateral transfer devices
   b. Wheelchairs
   c. Overhead track mounted patient lifters
   d. Walkers

**Sliding boards:** A slick board used under patients to help reduce the need for lifting during transfer of patient from bed to chair, or chair to car. Patients are slid rather than lifted.

- Some newer versions of sliding boards have devices that allow the resident to slide easily along the board without tissue damage and with no lifting involved.
- The friction of the movement is borne by the sliding board, not the patient’s skin. These devices are very useful for difficult transfers like car to wheelchair.
- This type of sliding board protects against back injuries, brachial plexus injuries and conditions which can cause pressure sores.

5. What is the main purpose of sliding boards?
   a. Reduce fall injuries
   b. Protection against back injuries
   c. Protection against conditions that can cause pressure sores
   d. Allow team-lifting of patients

**Slip sheets/Roller sheets:** Helps to reduce friction while laterally transferring or repositioning patients in bed. They also help reduce the force workers need to exert to move the patient.

6. Transfer sheets work by ______:
   a. reducing friction while transferring
   b. protecting against back injuries
   c. increasing force to move patient
   d. reducing the chance of falling
Repositioning Devices: Mechanically pulls patient up in bed, which eliminates manual maneuvering by staff.

Height adjustable electric beds: These should have height controls to allow for easy transfers from bed height to wheelchair height. These beds can be kept low to the ground for patient safety and then raised up for interaction with staff. Avoid hand cranked beds, which can lead to wrist/shoulder musculoskeletal disorders such as strain or repetitive motion injuries.

7. Why should a healthcare provider avoid hand cranked beds to move patients?
   a. Reduce friction
   b. It is better to use something easier
   c. They increase the amount of force to move patient
   d. They can lead to wrist/shoulder injuries

Trapeze lifts: A bar device suspended above the bed which allows patients with upper muscle strength to help reposition themselves. This device is particularly useful with adjustable beds and armless wheelchairs.

Walking belts or gait belts (with handles): Provide stabilization for ambulatory patients by allowing workers to hold onto the belt and support patients when walking. Not designed for lifting patients.

8. This type of device is not designed for lifting patients.
   a. Trapeze lifts
   b. Walking or gait belts
   c. Lateral transfer devices
   d. They can lead to wrist/shoulder injuries

Sitting-standing wheelchairs: Wheelchairs that provide sitting to standing options for patients and health care workers.

Pivot transfer disk devices: Used for standing pivot transfers and seated pivot transfers for patients who have weight bearing capacity and are cooperative.
9. When should a provider use a pivot transfer disk device?

   a. Only if patient has weight bearing capacity
   b. If patient refuses any other method
   c. If caregiver cannot lift patient any other way
   d. Only if the provider has wrist/shoulder injuries

Descent Control System (DCS): Emergency evacuation or retrieval from older or disabled structures may require using stairs or negotiating rough terrain when moving patients. These devices allow ambulance technicians or emergency evacuation personnel to safely move a loaded hospital cot or gurney downstairs or any steep decline. The Device easily attaches to any ambulance cot currently in the pre-hospital care market. When not in use, the DCS simply folds up and out of the way.

10. When should a provider use a Descent Control System (DCS)?

    a. Allows ambulance technicians to safety move a loaded hospital cot downstairs or any steep decline
    b. If patient refuses any other method
    c. Only if there isn’t another device readily available
    d. Only if the provider has wrist/shoulder injuries

Patient Care Plans

A written care plan that describes specific patient needs, degree of assistance required, special treatments etc. Possible scenarios include:

- color coding of patient lift requirements for posting at bedside. By simply looking at displayed color-coding system an employee can know what kind of assistance the patient/residents will need with moving or transfers.

- segregation of patients based on need, so equipment and trained staff are appropriately assigned.

- staggered staffing to provide additional manpower for peak periods.
11. A _____ care plan describes specific patient needs, as well as the degree of assistance required.

a. spoken
b. written
c. valid
d. provider
Module 3: Other Ergonomic Hazards

Introduction

Some reports indicate a significant number of work-related MSDs in the healthcare facilities occur in activities other than patient lifting.

Slips, Trips, and Falls

Potential Hazard

Slips/trips and falls from spills or environmental hazards.

- Environmental hazards such as:
  - slippery or wet floors
  - uneven floor surfaces
  - lifting in confined spaces
  - cluttered or obstructed work areas/passageways
  - poorly maintained walkway or broken equipment
  - inadequate staffing levels to deal with the workload, leading to single person lifts and greater chances of falls
  - inadequate lighting, especially during evening shifts

Possible Solutions

Good work practice includes implementing engineering and work practices controls to help prevent slips/falls such as:

- Eliminate uneven floor surfaces.
- Create non slip surfaces in toilet/shower areas.
- Immediately clean-up of fluids spilled on floor.
• Safely work in cramped working spaces-avoiding awkward positions, using equipment that makes lifts less awkward.

• Eliminate cluttered or obstructed work areas.

• Provide adequate staffing levels to deal with the workload.

1. What is a good example of an engineering control to help prevent slips and falls?
   a. Wait for approval to clean up spilled fluids on the floor
   b. Eliminate uneven floor surfaces
   c. Only allow a few workers in the area to limit exposure
   d. Make sure the area is obstructed and cluttered to keep things close

Awkward Postures

Awkward postures occur with twisted, hyper-extended or flexed back positions. They are unsafe back postures for patient lifting.

Potential Hazard

Increased potential for employee injury exists when awkward postures are used when handling or lifting patients. Awkward postures include:

• forces on the spine increase when lifting, lowering or handling objects with the back bent or twisted

• more muscular force is required when awkward postures are used because muscles cannot perform efficiently

• fixed awkward postures (i.e., holding the arm out straight for several minutes) contribute to muscle and tendon fatigue, and joint soreness

• reaching forward or twisting to support a patient from behind to assist them in walking

Possible Solutions

Good work practice recommends avoiding awkward postures while lifting or moving patients.

• Educate and train employees about safer lifting techniques.

• Use assist devices or other equipment whenever possible.
• Use team lifting based on assessment.

2. Which of the following is a good work practice technique to avoid awkward postures while lifting or moving patients?
   
   a. Educate employee about safer lifting techniques  
   b. Use assist devices whenever possible  
   c. Use team lifting  
   d. Do not use assist devices

**Transferring Equipment**

Strains and sprains can occur if an employee is transferring equipment like IV poles, wheelchairs, oxygen canisters, respiratory equipment, dialysis equipment, x-ray machines, or multiple items at the same time.

To reduce the hazards of transferring equipment:

• Place equipment on a rolling device if possible, to allow for easier transport, or have wheels attached to the equipment.

• Push rather than pull equipment when possible. Keep arms close to your body and push with your whole body not just your arms.

• Assure that passageways are unobstructed.

• Attach handles to equipment to help with the transfer process.

• Get help moving heavy or bulky equipment or equipment that you can't see over.

• Don't transport multiple items alone. For example, if you are moving a patient in a wheelchair in addition to an IV pole and/or other equipment get help. Do not overexert yourself.
3. What should you do to reduce the hazards when transferring equipment?

   a. Push rather than pull
   b. Pull rather than push
   c. Don’t move anything
   d. Do not use assist devices

Reaching Into Deep Sinks or Containers

If washing dishes, laundry, or working in maintenance areas and using a deep sink, limit excessive reaching and back flexion by:

- Placing an object such as a plastic basin in the bottom of the sink, to raise the surface up while washing items in the sink, or
- Removing objects to be washed into a smaller container on the counter for scrubbing or soaking and then replacing back in the sink for final rinse.

Lifting Heavy Bags

Limit reaching or lifting hazards when lifting trash, laundry or other kinds of bags by:

- Using handling bags for laundry, garbage, and housekeeping when possible. Bags which have side openings to allow for easy disposal without reaching into and pulling bags up and out. The bags should be able to slide off the cart without lifting.
  - Limit the size and weight of these bags and provide handles to further decrease lifting hazards.
- Using garbage cans that have a frame versus a solid can to prevent plastic bags from sticking to the inside of the can.
- Use products that stick to the inside of the garbage can to prevent the bag from sticking.
  - Limit the size of the container to limit the weight of the load employee must lift and dump.
  - Place receptacles in unobstructed and easy to reach places.
- Installing chutes and dumpsters at or below grade level.
• Using spring-loaded platforms to help lift items such as laundry. These keep work at a comfortable uniform level.

4. Why should you use a garbage that has a frame instead of a solid can?

   a. Easy to maneuver
   b. Prevents plastic bag from sticking
   c. Harder to use
   d. Solid cans are not as useful

Using Hand Tools

Limit strains and sprains of the wrists, arms, and shoulders, of maintenance workers by choosing hand tools carefully. Hand tools should:

• Be properly designed and fit to the user.
• Have padded non-slip handles.
• Wrist can remain straight by selecting ergonomic tools, such as ergonomic knives or bent-handled pliers
• Have minimal tool weight.
• Have minimal vibration or use vibration dampening devices and vibration-dampening gloves.
• Use trigger bars rather than single finger triggers.
• Not be used when performing highly repetitive manual motions by hand. You should use power tools instead (e.g., use power screwdrivers instead of manual screwdrivers).

5. When should you NOT use hand tools in a healthcare setting?

   a. Never use hand tools in a healthcare setting
   b. When patients are sleeping
   c. When performing highly repetitive manual motions
   d. If employees are not trained
Housekeeping Tasks

To decrease ergonomic stressors when employees are performing cleaning tasks employees should:

- Alternate the leading hand.
- Avoid tight and static grip and use padded, non-slip handles.
- Clean objects at waist level if possible, rather than bending over them (e.g., push wheelchairs up a ramped platform to perform cleaning work or raise beds to waist level before cleaning).
- Use knee pads when kneeling.
- Use tools with extended handles or use step stools or ladders to avoid or limit overhead reaching.
- When sweeping or dusting, use flat head dusters and push with the leading edge; sweep all areas into one pile and pick up with a vacuum.
- Use chemical cleaners and soaks to minimize force needed for scrubbing.
- Frequently change mopping styles when mopping (e.g. push/pull and rocking side to side) to alternate stress on muscles.
- Be sure buckets, vacuums, and other cleaning tools, have wheels or are on wheeled containers with functional brakes.
- Alternate tasks or rotate employees through stressful tasks.
- Avoid awkward postures while cleaning (e.g. twisting and bending).
- Use carts to transport supplies rather than carrying.
- Use buffers and vacuums that have lightweight construction and adjustable handle heights.
- Use spray bottles and equipment that have trigger bars rather than single finger triggers.
6. To decrease ergonomic stressors when performing cleaning tasks, you should _____.

a. not alternate the leading hand  
b. ensure tight and static grip  
c. not clean longer than an hour at a time  
d. never clean
Additional Resources

- Occupational Safety and Health Administration (OSHA) Website
- Home Healthcare Workers- How to Prevent Musculoskeletal Disorders
- Safe Lifting and Movement of Nursing Home Residents
- Ergonomics for the Prevention of Musculoskeletal Disorders
- Preventing Work-Related Musculoskeletal Disorders in Sonography
- Addressing the Unique Physical and Nutritional Needs of Bedside Clinicians