

ERGONOMIC HAZARDS



Our bodies normally recover from the wear and tear of work after a period of rest. But if the stresses continue day after day without time to recover, the damage can lead to ergonomic injuries.

Many different terms are used to describe these ergonomic injuries. For example:

- **Cumulative trauma disorders (CTDs).** Ergonomic injuries involve strain that may develop, or accumulate, over time.
- **Repetitive strain injuries (RSIs).** Ergonomic injuries are often caused by repeating the same motions over and over.
- **Musculoskeletal disorders (MSDs).** Ergonomic injuries affect the muscles, bones, tendons, nerves, and tissues.

These terms do not necessarily refer to different conditions. Many ergonomic injuries can be described in all three ways.

These disorders include a number of specific diseases such as carpal tunnel syndrome, bursitis, and tendinitis. Back injuries are the most common and most costly MSD.

Symptoms of these disorders are most common in the back, hands, arms, wrists, elbows, neck, and shoulders. They include:

- Soreness or pain (aching or sharp)
- Stiffness
- Swelling
- Loss of coordination
- Numbness
- Tingling (as though the area is “asleep”)
- Unexplained weakness





If your work exposes you to any of the ergonomic risk factors described on page 3 of this factsheet, these symptoms may be signs that you have an MSD.

It is important to seek medical care if these symptoms:

- Last for more than a week
- Bother you so much that you restrict activities or take time off to recover.

If You Believe You Have an MSD

- Seek early treatment. The longer you have symptoms without getting help, the harder they can be to treat successfully.
- Find a doctor who understands work-related health problems. Don't be afraid to educate your doctor about the possible causes of your MSD.
- If your problem is work-related, report it to your supervisor. You may be eligible to file a workers' compensation claim to cover lost work time and/or medical costs.
- Don't return to the same working conditions that caused your problem. Work with others at your school to ensure that the equipment or activities that contributed to your injury are changed.
- Finding the right doctor, getting effective treatment, and improving your work environment take persistence and energy. Don't hesitate to ask for help and don't give up until the problem is solved.





Risk Factors for Ergonomic Injuries

The field of ergonomics examines the fit between employees and their jobs. Ergonomics look at:

- What body movements and positions people use when they work.
- What tools and equipment they use.
- The physical environment (temperature, noise, lighting, etc.).
- The organizational environment (deadlines, teamwork, supervision).
- Whether any of these factors may place an employee at risk of injuries or illnesses.

The goal of ergonomics is to fit workplace conditions and job demands to the capabilities of the individual worker, instead of making the worker fit the job.

To prevent injuries, *ergonomic risk factors* must be identified. Ergonomic risk factors are workplace situations that cause wear and tear on the body and can cause injury. Once these have been identified, you can work on finding ways to eliminate them.



Ergonomic Risk Factors

RISK FACTORS	DEFINITION	POSSIBLE SOLUTIONS
Repetition	Making the same motion over and over.	Redesign task to reduce repetitions; increase rest time between repetitions; rotate among tasks with different motions.
Awkward Posture	Prolonged bending, reaching, kneeling, squatting, or twisting any part of your body.	Redesign tasks, furniture, and equipment to keep the body in more “neutral” positions and minimize reaching bending and twisting.
Forceful Motion	Excessive effort needed to do tasks such as pulling, pounding, pushing, and lifting.	Redesign task to reduce the exertion needed; assign more staff; use mechanical assists.
Stationary Position	Staying in one position too long, causing fatigue in muscles and joints.	Redesign task to avoid stationary positions; provide opportunities to change position.
Direct Pressure	Prolonged contact of the body with a hard surface or edge.	Improve tool and equipment design or layout to eliminate pressure; provide cushioning material.
Vibration	Using vibrating tools or equipment.	Insulate the hand or body from vibration; keep tools or equipment in good condition to reduce excessive vibration.
Extreme Temperature	Working where it is too hot or too cold. Cold reduces feeling, blood flow, and strength. Heat increases fatigue.	Control temperature where possible; insulate the body against cold by wearing gloves and warm clothing; provide breaks and fresh water in hot environments.
Work Stress	Includes machine-paced work, inadequate breaks, monotonous tasks, multiple deadlines, poor work organization, or poor supervision.	Establish reasonable workload; provide sufficient breaks and vary tasks.

- The more risk factors you face, the greater your chance of injury.
- The longer you are exposed to a risk factor, the greater your chance of injury.
- By reducing or eliminating risk factors, the chance of injury can be decreased.



Identifying Risk Factors

Below are some ways to identify ergonomic risk factors.

TALK TO EMPLOYEES: SURVEYS OR INTERVIEWS

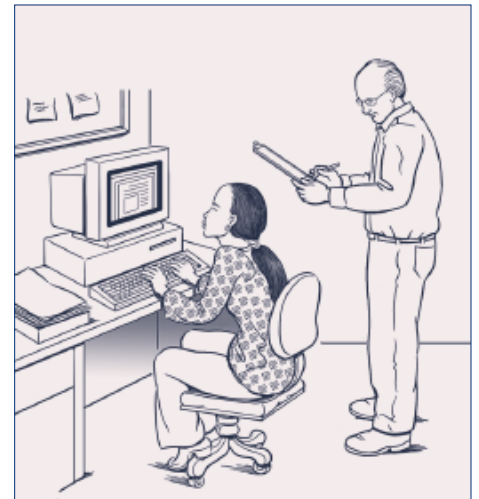
Employees are often the best source of information on the potential problems posed by their jobs. You can conduct a written survey or talk to people individually.



LOOK AT JOBS: INSPECTIONS AND JOB EVALUATIONS

Conduct a walkaround inspection of the school environment to see which jobs or tasks may pose ergonomic problems. Those jobs can then be evaluated to identify specific risk factors. When evaluating a job, break the work down into the smallest pieces possible so that you can be specific and detailed.

Once you have watched people do their work and asked them about it, use a checklist or similar form to record risk factors as well as to track your progress in resolving a problem.



Below are some tips for conducting job evaluations.

A job evaluation should include three parts:

- **Discussion.** Talk to the people doing the job. Ask whether they experience pain or discomfort while performing the job and what specific activities seem to trigger that pain. Understanding the relationship between pain and specific activities can help you pinpoint tasks, workstations, equipment, or tools which may be causing or aggravating injuries.
- **Job description.** Collect information that fully describes each specific task, job, workstation, tool, and/or piece of equipment that you evaluate. Include information about work pace and work schedule, including break times. See if there is a written job description available and supplement it with your own notes.
- **Observation and measurement.** Use direct observation, videotapes, photos, and sketches to identify risk factors. Use a checklist to record specific risk factors, including the weights of objects, how long they are held, or how far they are moved.

Controlling Ergonomic Hazards

There are many ways to reduce ergonomic risk factors and help fit the workplace to the worker. Solutions can be grouped into three main categories: eliminate the hazard, improve work policies and procedures, and provide personal protective equipment. Often the best solution involves a combination of approaches.

Eliminate the Hazard

The most effective way to control ergonomic hazards is to eliminate the risk factors altogether. Sometimes you can change the tools, equipment, job design, or work area to remove the hazard completely. This is called using “engineering controls.”

These are some examples of engineering controls:

- Redesign workstations and work areas to eliminate reaching, bending, or other awkward postures.
- Provide adjustable tables and chairs that can be used by employees with a range of sizes and shapes, and that allow neutral postures.
- Provide carts for transporting material and mechanical hoists to eliminate lifting.
- Use tools that fit the hand, have no sharp edges, and eliminate awkward hand and wrist positions.
- Change where materials are stored to minimize reaching.
- Design containers with handles or cutouts for easy gripping.

Improving the workplace is the heart of ergonomics: changing the work to fit the worker. The design should accommodate the wide range of people assigned to the task.





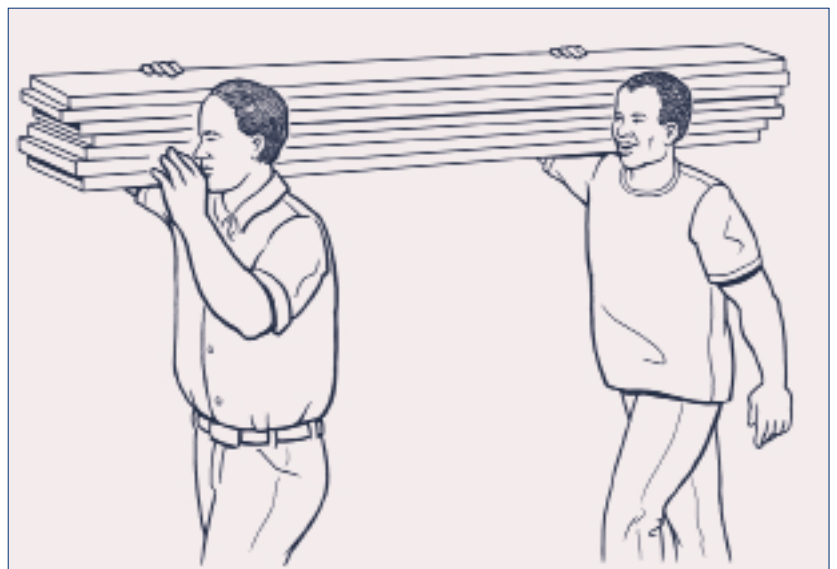
Improve Work Policies and Procedures

The next most effective solution is to develop work policies, procedures, and practices that change how the job is done. This is called using “administrative controls.”

These are some examples of administrative controls:

- To the extent possible, rotate employees among different tasks to rest the various muscle groups of the body, reduce repetition, and ease mental demands.
- Improve work scheduling, if possible, to reduce risk of fatigue.
- Increase staffing to reduce individual workloads.
- Provide sufficient breaks, since adequate recovery time can reduce fatigue.
- Assign more staff to lifts of heavy objects.
- Encourage proper body mechanics and use of safe lifting techniques (see box on next page).
- Require all loads to be labeled with their weight.
- Store heavy objects at waist height.
- Follow good housekeeping practices. Keep floors free of slipping or tripping hazards. Maintain power tools properly to reduce vibration. Keep cutting and drilling tools sharp to reduce the force required.
- Provide workers with training on safe working postures, lifting techniques, ergonomics policies and procedures, and the safe use of lifting and carrying devices.

Training is a critical element of nearly any solution and provides an important opportunity for employee participation. However, it is not a substitute for reducing risk factors and should be used in combination with engineering and administrative controls.



SAFE LIFTING TECHNIQUE

Lifting can put great strain on your back. Lifting from the floor can be particularly risky. For example, lifting a 25-pound box from the floor requires about 700 pounds of back muscle force, even when you bend your knees. Below are some tips that can help protect your back when you need to lift heavy objects.

- Try out the load first. If it is too bulky or heavy, get help.
- Avoid lifts that require stretching or bending to reach the load. Redesign the work area so objects you lift are close to the body and at waist height.
- Don't lift awkward objects such as long pipes or large boxes by yourself. Get help or use mechanical assists.
- When lifting, keep your back straight and lift with your legs.
- Lift slowly and carefully and don't jerk the load around.
- Keep the load as close to your body as possible while lifting it.
- Don't twist or turn your spine while carrying the load.
- Make sure your path is clear while carrying the object. Remove obstacles that could cause you to trip.

A program to teach employees how to lift properly should be used in combination with workplace redesign that reduces the amount of lifting needed. Remember, if materials are too heavy or awkward to lift and carry safely, get help, redesign the materials to be lighter and easier to handle, or use mechanical assists such as carts.





Provide Personal Protective Equipment

While more permanent solutions are being found and implemented, or if you are unable to redesign the job or equipment to eliminate risks, personal protective equipment (PPE) can be used.

PPE that can help address ergonomic problems includes:

- Knee pads for kneeling tasks.
- Shoulder pads to cushion loads carried on the shoulder.
- Gloves to protect against cold, vibration, or rough surfaces.

A CAUTION ABOUT BACK BELTS

Back belts are sometimes provided as PPE. Back belts have been studied extensively, and experts have concluded that they are not effective in preventing back injuries. Some believe that, in fact, they may cause injury by encouraging workers to lift heavier objects or by making muscles weaker. Most importantly, they do not make workers stronger or more able to perform a lift that is awkward or too heavy. The National Institute for Occupational Safety and Health (NIOSH) recommends that employers not rely on back belts to protect workers. Instead, it recommends that employers implement a comprehensive ergonomics program that includes workplace assessment, hazard reduction, and worker training.

Establish a Comprehensive Ergonomics Program

School districts should establish an ergonomics program to minimize musculoskeletal disorders.

Elements of a good program include:

- Management commitment
- Employee involvement
- An organizational structure to get the work done, such as an ergonomics team or committee
- Training and education of employees and supervisors
- Job evaluation to identify risk factors
- Hazard prevention and reduction or elimination of risk factors
- Early detection and treatment of ergonomic injuries, and medical management of injury cases
- A system for employees and supervisors to report ergonomic problems, symptoms, and injuries without reprisal
- Ongoing evaluation of the ergonomics program.

The above was adapted from materials developed for California Worker Occupational Safety and Health Training and Education Program (WOSHTEP)



Inspection Checklist for Ergonomic Risk Factors

Date: _____ Time: _____ Employee observed: _____

Job title: _____ Task: _____

Task description: _____

RISK FACTORS	Found In This Task	Cause/Description	Possible Solutions
Repetition			
Repeated forceful or awkward motions			
Little or no rest			
Using same body part repeatedly			
Awkward Posture			
Bending or leaning forward			
Reaching or lifting below knee level			
Twisting or bending to the side			
Reaching above chest level			
Bending wrist frequently			
Twisting hands or forearms			
Raising arms to side or forward			
Bending neck			
Forceful Motion			
Lifting, pushing, or pulling more than 50 pounds			
Lifting more than six pounds with one hand			
Forceful gripping of material or tools			
Handling tools or material in pinch grip			

(continued on next page)



Inspection Checklist for Ergonomic Risk Factors

(continued from previous page)

RISK FACTORS	Found In This Task	Cause/Description	Possible Solutions
Stationary Position			
Working in one position for long periods			
Standing for long periods			
Sitting for long periods			
Direct Pressure			
Tool or equipment pressing on hand or body			
Seat or table pressing on leg or body			
Vibration			
Using vibrating hand tools			
Operating vibrating heavy equipment (including large vehicles)			
Temperature and Environment			
Temperature too hot or too cold			
Workplace poorly lit			
Walkways obstructed or slippery			
Work stress			
Pace of work is machine-controlled			
Piece work is used as production incentive			
Insufficient work breaks			
Poor supervision			

Inspection checklist was adapted from: NIOSH "Elements of Ergonomics Program," Tool box Tray 5-A, www.cdc.gov/niosh/epbtr5a.html, and "Working Without Pain Train the Trainer Program," Hunter College Center for Occupational and Environmental Health.