

Ergonomics In The Workplace

Ergonomics involves arranging the work area to fit the employee. By applying ergonomics to the work environment, employees can work comfortably, safely, and efficiently. It is important to become aware of basic ergonomic information and practices. Following ergonomic guidelines helps reduce stress and eliminate many potential injuries that may be associated with the overuse of muscles, bad posture and repeated tasks. By properly setting up your workstation, you reduce your risk of developing a Repetitive Motion Injury (RMI).

Ergonomic stressors cause a variety of disorders and illnesses related to muscles. The most common of these disorders in the office are carpal tunnel syndrome and back disorders.

RMIs affect the nerves, tendons, and muscles, with hands, wrists, elbows and shoulders being most frequently affected. These injuries develop gradually and may result from repetitive motions, forceful exertions, vibration, awkward postures, hard and sharp edges.

Many jobs require the repetitive use of shoulders, back, arms, wrists and hands. These joints can be strained when overused or irritated by repetitive motions. Repetitive motion injuries are injuries which result in damage to soft tissues like muscles and tendons. Soreness, swelling or muscle tearing causes the damage. RMI symptoms usually develop as a result of months or years of strain. Symptoms may include:

- Pain and discomfort
- Numbing, tingling sensations
- Limited range of motion
- Weakness
- Redness and swelling
- Pins and needles

By making an effort now to build good habits, workstation organization, proper lifting techniques and reducing the pressure on joints, you can avoid RMIs later.

Prevention is the key word in controlling RMIs. The following guidelines will assist you in making your workplace fit you.

SEATING

Your chair is the most used piece of equipment in your office. Adjusting your chair can increase your overall stability, enhance your general comfort, improve leg circulation, reduce stress on your back, and reduce fatigue.

- The seat height should be adjusted so upper arms hang vertically with elbows bent at 90 degrees and the backrest supports the small of the back. There should be space behind knees and a 90-degree or more angle between lower leg and thigh for leg circulation. Feet should be securely placed on the floor or on a footrest.

- If your chair has various adjustments (seat tilt, variable lumbar pressure, etc.), experiment to find the most comfortable settings. Different tasks often require different settings.
- Change your posture frequently. Minor chair adjustments during the day can also relieve some muscle stress and stiffness.

Back:

- A properly adjusted backrest reduces pressure on your spine and supports your lower back.
- Sit at your workstation and lean back lightly with your back firmly against the chair.
- The backrest should fit snugly against your lower back.
- If it doesn't, adjust the backrest until your lower back is fully supported. If you can't adjust the backrest, use a small, thin, firm pillow or rolled-up towel to support your lower back.

Arm Position:

- Place your fingers on the middle row of your keyboard, with your upper arms hanging comfortably at your sides.
- Your forearms should be parallel to the floor.
- If they are not, adjust your chair height up or down until your forearms are parallel to the floor.

Feet:

- Move your feet forward until your knees are at a 90-110 degree angle.
- Your feet should rest firmly on the floor with 3-6 inches of legroom between your lap and desk or keyboard tray.
- If you have less than 3 inches of leg room, raise your desk or keyboard tray height, if possible.
- If you can't adjust your chair height and your feet don't reach the floor, use a footrest to support your feet.

KEYBOARD

The height of your keyboard affects your posture. You will be most comfortable with your keyboard at about seated elbow height. At this height your wrists tend to be straighter and your shoulders more relaxed. This posture may also reduce the risk of wrist problems and neck or shoulder pain. If you use a mouse, it should be positioned as close to your keyboard as possible and at a matching height. A preferred solution is to use a keyboard holder wide enough to place the mouse adjacent to the keyboard. It is best to use an "articulating" keyboard tray, which adjusts both height and angle. The proper keyboard height can help keep you from bending your wrists while typing. This improves the comfort of your hands, wrists, and forearms, and helps avoid injury. It also slides under the work surface when not in use.

Hand Position:

- Place your fingers on the middle row of your keyboard.
- Your wrists should be straight and relaxed.
- If they aren't, adjust your keyboard height up or down until your wrists are straight.
- To help keep your wrists relaxed, try a gel wrist rest. A gel wrist rest reduces pressure, improves wrist posture and comfort.

- If your wrists are still not straight, readjust your chair height, making sure your feet remain on the floor or footrest.

COMPUTER MONITOR

Place your monitor at seated eye level to reduce neck strain and improve overall posture. Repeatedly tilting your head up, down, or to the side to look at the monitor can contribute to neck strain and stiffness, back discomfort, and other aches from awkward pressure. To adjust your monitor to the proper height, you can place the monitor on a support arm, which allows you to raise the monitor and adjust it horizontally. Also, there are height adjustable risers that can be placed under the monitor so it sits at the proper height.

Screen Height:

- With your lower back supported and feet firmly on the floor or footrest, hold your head upright and look straight at your screen.
- The top of your monitor should be at or below eye level.
- If it isn't, raise or lower your monitor until it is at a viewing height that will allow you to maintain your head in an upright position.
- A copy holder with a solid back will help to prevent neck strain from looking up and down between your monitor and documents. It can also reduce eye fatigue from excessive visual refocusing at different distances. Place the copy holder the same distance from your eyes as the monitor. Most copyholders can be attached at either side of the monitor.

Screen Distance:

- Measure the distance from your eyes to the screen.
- The screen should be 18-30 inches from your eyes, or at about arm's length.
- If not, move your monitor forward or backward to the desired distance.

MOVEMENT

Variety and movement keep you physically and mentally alert. Break up your computer work with breaks, non-computer tasks, and movement. Take some kind of break from the computer at least every two hours by alternating tasks such as phone calls, filing, meetings, etc. Change your posture frequently. Even readjusting your chair slightly changes your posture.

Breaks:

Throughout the day, readjust your sitting posture and take thirty-second microbreaks right at your workstation. Doing some simple stretching exercises can help energize your body and relieve muscle tension. This is particularly important when you work intensively or extensively at the computer.

LIGHTING

Typically, computer work areas require less overall illumination than other office work areas. Excessive or inappropriate illumination contributes to eye discomfort and headaches.

Glare:

Glare is the reflection on your screen that makes it hard to see the screen clearly. Glare may be caused by sunlight on your screen, or by inside light, such as overhead and task lamps. Simple lighting adjustments can help you minimize glare and reduce strain on your eyes. Adjusting your screen's contrast and brightness can also help improve viewing comfort.

Outside Light:

Controlling light from uncovered windows and adjusting the angle of your display will help you eliminate or reduce glare on your screen.

- While sitting at your workstation, look at your screen. It should be free of glare from light coming through outside windows.
- If it isn't, close the blinds or pull the shades to help reduce glare.
- You may need to readjust periodically to help keep glare off your screen as the outside light changes throughout the day.

Inside Light:

Controlling light from overhead or task lamps can also help eliminate glare on your screen.

- While sitting at your workstation, look at your screen. It should be free of glare from overhead lighting.
- If it isn't, reduce overhead lighting, tilt or swivel your screen, or see about getting an anti-glare filter.
- If a task lamp causes glare on your screen, adjust the angle of your task lamp to aim the light at your document instead of your screen.

Light from Your Computer:

- You may also need to fine-tune your display's contrast and brightness.
- Adjust contrast and brightness together to get the maximum possible brightness without blurring.

ARRANGING YOUR WORK AREA

Workstation Props:

- Arrange your props so that the things you use the most are within easy reach and the things you don't use often are further away.
- Consider a headset if telephone calls are frequent.
- If your work area is a drafting or drawing table, cushion the edge to eliminate resting your wrist on a hard surface.

Computer Area:

- Data Entry

In a data entry job, much time is used looking at source documents with brief glances at the monitor. One hand keys while the other hand often holds input information. Many times the data input is numerical in nature. The keyboard placement and use of copy holder are important. An example would be accounting, IT, billing, and payroll.

- **Data Retrieval**

With data retrieval, the operator brings up information from a computer file and reads it on the monitor, or scans for specific information often writing it down. The operator's attention is mostly directed to the monitor. Monitor placement is important and the keyboard and hard copy may have minor roles. An example would be travel agents or employee resources areas.

- **Interactive and Word Processing**

In interactive tasks, the operator enters information, waits for feedback, and then responds with more input. Airline ticket agents have interactive computer tasks.

Interactive and word processing tasks require both data entry and data retrieval. Generally about half the time is looking at the monitor and half the time looking at hard copy.

- **Graphic Design**

When creating graphics, typically the operator uses a mouse or bit pen to enter information and constantly observes the monitor for accuracy. The keyboard and hard copy are used less frequently. Illustrators and graphic designers would be examples.

OTHER COMMON ISSUES

LIMIT REPETITIONS

Limiting repetitive motions or tasks will reduce body-part strain.

- Rearrange your workstation and alter your work methods by combining several steps also helps reduce the chance of strain.
- Reverse stretches are essential to give the body a chance to recover from constant movement.

NEUTRAL POSITION

When you work in a natural or neutral position, there is less strain on your body. Here's how to put your body in a neutral position.

Neck:

- Stand up straight, with arms relaxed at your side.
- Put two fingers on your top lip and press your head backwards until you feel a slight stretching.
- Take your fingers away, keeping the position, and let your head glide forward until it is comfortable and you feel relaxed.

Shoulders:

- Move your shoulders back until you feel them stretching.
- Hold this position, and then allow your shoulders to glide forward naturally.

STANDING

If your job requires that you stand, place your feet shoulder-width apart with one foot slightly in front of the other or use a footrest to ease strain on your lower back. If your job allows, shift your working position from standing to sitting and back to standing to minimize the strain on the same muscle groups.

WORK AREAS

Most workstations are designed for the so-called “average size” person. Your workstation can be rearranged to fit you with relatively inexpensive and simple changes.

- Work should be performed slightly above waist level whenever possible. If work surfaces are adjustable, they should be moved up or down so that you are working in a neutral position with minimum strain.
- If you are working overhead or at a conveyor belt, you may need a platform to raise yourself up so that you can work in a neutral position.
- Work materials should be placed within easy reach of your work area. Tilting storage containers allow for easy reach with minimum effort. Avoid storing frequently used materials overhead, since reaching for them can cause strain to the arms and upper torso. Use a ladder or stepstool to retrieve overhead items.

CHAIRS

If your work requires that you sit for most of the day, a good, ergonomically designed chair is your key to good posture and comfort.

- Use a chair that is adjustable up and down, so that your feet are flat on the floor.
- Adjust the backrest of your chair to fit the curve of your lower back.
- If possible, use a chair with solid adjustable armrests to support your arms.
- Use a chair with a seat that swivels to help protect your back from unnecessary twisting.

USE LESS FORCE

In order to prevent injury, use the minimum force necessary to do your job. Don't grip tools too tightly or continuously hold a tool in the same grasp as you use it.

Ways to limit force:

- Use smooth movements instead of rough, jerky movements while performing work tasks.

- Move carts by pushing rather than pulling. This will help relieve back stress by using larger, stronger muscles.
- Use power tools whenever possible to cut down on required force. You can reduce the throbbing or vibration caused by power tools by wearing gloves. Gloves should fit correctly and have special textured surfaces or padding to reduce vibration.
- Use hand tools that are well oiled and sharp, so that they don't require extra strength to operate.
- Tools should be the proper size for the job--not too big or too small. Carrying the tools in a palms-down position also lessens hand-muscle stress.
- When possible, use a vice to hold the material you're working on.
- Tools with handles covered in a semi-soft, nonslip, compressible material are easier to hold and use.

NO PRESSURE

- Hard, sharp edges of worktables or surfaces can cause injury by digging into the soft nerve tissues of your hand or arms.
- Don't lean your wrists or elbows on hard, sharp edges. Over time, pressure on these least padded parts of your arms can result in injury.
- Pad any hard surfaced edges you repeatedly rest your hands and arms against.
- Choose tools with comfortable, long-gripped handles. Tools with short handles are less desirable, as they bring pressure directly to the center of the palm.

BACK

Your back is also vulnerable to cumulative trauma. Back injuries result from the cumulative effect of bending, twisting, or excessive sitting or standing. Proper posture and lifting techniques can prevent your back from becoming out of tune with the rest of your body. Muscle-stretching exercises, a nutritious diet, and overall wellness build a healthy back and body.

You can relieve fatigue and strain with these simple procedures:

1. Change position frequently if possible.
2. Stretch by clasping hands behind head, bring elbows back. Then bend forward until back is horizontal.
3. Adjust working heights to prevent slumping or excess reaching.

Learn to rest your muscles while you are:

Standing: Stand tall, head held high, chin tucked in, abdomen flat, hips tucked under, chest slightly up and forward. When leaning forward, bend knees slightly.

Sitting: Keep knees higher than hips; use a low stool to slightly raise feet. Cross knees for temporary relief (alternate often). Keep lower back flat against firm backrest.

Sleeping: Sleep on a firm mattress, or use a board between springs and mattress. Lie on side with hips and knees bent or on back with pillow under knees or lower legs. Avoid sleeping on stomach.

HOW TO LIFT

Lifting materials incorrectly often causes back pain. These simple lifting techniques will help you ease the strain on your back:

- Get your body as close to the object as possible.
- Assume the correct lifting position: feet shoulder-width apart with one foot in front of the other. Lean over the front leg bending at the hips. Grip the load firmly and return to an upright position using your leg muscles.
- When carrying an awkward or heavy object, turn with your feet not your waist.
- Put the object down by moving slowly and avoid jerky motions.
- Be sure of the objects final destination before moving.
- When lifting heavy objects get help. Ask a co-worker or use mechanical aids such as a hand truck, forklift or hoist.

Lifting Overhead

The maximum load you can lift should be lighter than because you can't use your legs. Spread your feet with one foot slightly forward. Use a firm platform or sturdy ladder for extra-high lifts. Do not use a chair or box. When in doubt – get help.

Lifting Heavy Objects

If an object is too heavy, large or hard to handle, do one of the following:

1. Get others to help. Be sure to lift in unison.
2. Use a mechanical aid – forklift, winch, jack, etc.
3. Do it in pieces, one step at a time.

GUIDELINE SUMMARY

- Feet flat on floor or stable on footrest.
- Ninety degree angle or more between upper and lower legs.
- Space behind knees.
- Back support.
- Forearms should be parallel to the floor.
- Wrists should be straight and relaxed.
- Wrist support.
- Top of monitor at eye level.
- Screen should be 18-30 inches from your eyes.
- Documents at eye level and near monitor.
- Keyboard at elbow height.
- Equipment arranged appropriately.
- Varied Tasks.
- Posture changes.
- Stretches.
- Minimal glare.
- Limit repetitions.

- Use less force-use minimum force necessary to ho your job..
- Pad any hard surfaced edges you repeatedly rest your hands and arms against.
- Proper lifting techniques.
- Prevention - make proper adjustments and modifications to work areas before injury occurs.

DEPARTMENTAL RESPONSIBILITIES

If you have any concerns with your work area, do not hesitate in bringing it to the attention of your Department Head, Manager, and/or Supervisor. It is their responsibility to ensure that proper adjustments and modifications are made. The Department Head, Manager and/or Supervisor should contact S&EA at 818.954.2961.

If you feel that you are experiencing any of the symptoms associated with a repetitive motion injury, please contact First Aid immediately. First Aid will be able to do a preliminary assessment of your condition.