ERGONOMICS: WORKSTATION

As the electronic information age has advanced, so too have concerns and complaints about working with computers. By a combination of proper design and appropriate work habits, it is possible to virtually eliminate the risk of acquiring repetitive motion disorders associated with keyboard work.

Risk Factors for Computer Users

Many activities and work operations can cause minor aches and pains that we all experience at one time or another. For those who spend large amounts of time working with computer workstations, three factors have been identified as contributing to ergonomically-related problems. These are awkward posture, duration and repetitive motion. Although any one alone can create problems, the combination of all three produces the most significant risk of injury. While reviewing these factors, keep in mind that they apply to all activities and not just computer use at work. Also, recognize that you have control over how you work and that your approach to the work can have a significant impact in preventing future problems.

Awkward Posture

Awkward posture refers to positions of the body that deviate significantly from the neutral position while performing work activities. When you are in an awkward posture, muscles operate less efficiently and you expend more force to complete the task.

Examples of awkward postures are twisting, bending, reaching, pulling or lifting. Other examples of awkward postures are working with your hands above your head, your elbows above your shoulders, working with your neck or back bent more than 30 degrees without support and without the ability to vary posture.

Preventive Measures and Controls

- Be aware of your posture. Good posture maintains the natural curve of your spine and includes relaxed shoulders that are held slightly back and level, ears in line with your shoulders, chin tucked slightly inward and pelvis shifted forward to allow the hips to align with the ankles.
- Sit close to your work and keep frequently used materials within reach.
- Maintain neutral wrist/arm postures as much as possible.
- Avoid twisting and bending motions. These types of movements can put pressure on your spine's discs.
- Use both hands instead of one to lift or complete tasks.
- Respect your discomfort or pain. Change positions, stretch to ease stiff muscles, take a short break or change tasks.

Standing or sitting in the same position for an extended period of time is a common cause of back, neck and leg pain. Awkward posture often stresses the spine and causes muscle fatigue and pain. A few minutes of walking or stretching will increase circulation and help you feel better and be more productive.

Repetitive Motion

Motions performed infrequently, even if performed in an awkward position, seldom result in any bodily harm. However, as a particular motion becomes more and more frequent, the risk of injury increases. With keyboard work, some motions are repeated as often as every few seconds. When performed for a prolonged period of time, fatigue and strains accumulate. Changing tasks during the day or taking periodic breaks can provide muscles and tendons with the time needed to recover to their normal unstressed state.

Duration

The longer the same muscle or muscle group is used, the greater the likelihood of both localized and general fatigue. This is why rest breaks or changing tasks is so important to decrease prolonged static postures and thereby reduce the risk of injury. The use of position aides, such as foot rests, copy holders, adjustable chairs and keyboard trays is also important to minimize fatigue to muscle groups not directly involved in the computer work activity.

Repetitious work can cause fatigue on your upper extremities as well as your eyes. It is important that you take breaks from working at the computer every 20 to 40 minutes in order for your body to rest and recover. Taking a short break (three to five minutes) does not mean you have to stop working. Other activities such as talking to a co-worker, making copies, filing, etc. could be done during breaks from typing.

It is also important to change positions periodically. Sitting in one position or leaning on your arms for an extended period of time can interfere with circulation.

Human Anatomy and Workstation Issues

Exercising and Stretching

Breaks or changes in work tasks coupled with various exercises and stretching can provide you with the time needed for stressed muscles and tendons to recover to their normal state and also help fight injuries that accumulate after intensive, long-term keyboarding work. If you have any pre-existing conditions that you believe could be negatively impacted by these stretches, consult your clinician prior to performing them.

- Hold the stretch for 20-30 seconds, since long sustained stretches produce more relaxation.
- Breathe slowly and rhythmically during the stretch.
- Keeping the stretch within comfortable limits to avoid bouncing or jerking, which can injure rather than help muscle tissues.

Eyes and Vision

For most computer users, the monitor screen is the active location where work progress is followed. Like other activities requiring continued focused use of the eyes, reading a monitor screen for hours at a time can cause eye strain. Symptoms of over use include blurred vision, headaches and eye fatigue.

- Place your monitor in a direct straight line with your keyboard and chair to avoid continually refocusing your eyes. For most people, a distance of 15–30 inches from your eyes to the monitor is ideal.
- Set your monitor height even with, or slightly lower, than your plane of vision.
- Adjust the contrast, brightness and color or your monitor to a comfortable level.
- Electrostatic charges on your monitor screen accumulate dust. Keep your screen clean using a damp cloth or special lens paper to avoid scratching the surface.
- Use a copy stand or other means to prop written work materials up and as close and even with your monitor screen as possible.
- Avoid screen glare by facing your monitor away from windows and tilted slightly downward to prevent glare from overhead lights.
- Take breaks to change the focus of your eyes whenever working at your computer for long periods of time.
- Even if you don’t use a computer frequently, it is still a good practice to have your vision checked regularly.

Neck and Shoulders

Poor posture, awkward workstation arrangements and non-adjustable seats can all contribute to a sore neck and shoulders.

- Place your monitor in a direct straight line with your keyboard and chair to avoid twisting and bending when working.
- Set your monitor height even with, or slightly lower, than your plane of vision.
- Use a copy stand or other means to prop written work materials up and as close and even with your monitor screen as possible.
- Arrange your telephone, frequently used reference materials and other important workstation supplies within comfortable reaching distance.
- Keep your mouse on your keyboard tray or as close to the tray as possible to avoid reaching or stretching for it.
- Take breaks to change your posture and body position whenever working at your computer for long periods of time.

Back

Most back problems associated with computer workstations are identical to those caused by any activity requiring extended sitting including soreness or stiffness, often in the lower region of the back.

- Place your monitor in a direct straight line with your keyboard and chair to avoid twisting and bending when working.
- Good sitting posture will virtually eliminate the possibility of back problems. Achieve good posture by sitting straight in your chair, planting your feet firmly on the floor (or a foot stool if the chair cannot be lowered for any reason) and keeping your lower back firmly supported by the lumbar support of your chair.
- Take breaks to change your posture and body position whenever working at your computer for long periods of time.

Wrists and Arms

Your hands, wrists and arms do most of the active work at a computer workstation. Repetitive motion injuries to the wrist are among the most common problems associated with all activities that involve extensive use of our hands. These range from occasional soreness or stiffness to the debilitating carpal tunnel syndrome.

- Keep your upper arms and forearms at about a 90 degree angle.
- Keep your forearm, wrist and hand in a straight a line as much as possible. This position, known as the neutral position, is the single most important step you can take to avoid repetitive motion injuries to your wrists.
- You can achieve the neutral position by either raising or lowering you chair or work surface or by using an adjustable keyboard tray.
- Keep your mouse on your keyboard tray or as close to the tray as possible to avoid reaching or stretching for it.
- Use a light touch. Do not bang or smash the keyboard. Use a gentle grasp to hold and manipulate the mouse.
- Take breaks to change your posture and body position whenever working at your computer for long periods of time.

Legs and Arms

Although your legs and feet are not usually the active elements of computer work, the very nature of sitting for extended periods of time can affect these parts of your anatomy.

- When sitting, plant your feet, or at least the balls of your feet, firmly onto the floor to help counter balance the forces on your back.
- If placing your feet directly on the floor means you must sit too low to comfortably type or see the monitor screen, get a foot stool or rest to raise up the floor to your feet.
- Avoid chairs that have a sharp edge along the front leading edge. Over time, these edges can compress muscles, tendons, nerves and blood vessels and cause numbness or even pain in your legs or feet.
- Take periodic breaks and get up out of your chair to exercise inactive muscles and increase blood circulation to your legs and feet.