

OFFICE ERGONOMICS

Ergonomics is concerned with the design of working systems in which human beings interact with machines. It is the science of fitting the workspace to the worker – not the worker to the workspace.

Cumulative Trauma Disorder (CTD) and Repetitive Strain Injury (RSI) are two conditions caused by wear and tear on tendons, muscles, and nerves. Both injuries are brought about by **cumulative** overuse, and often result in pain.

The three primary risk factors found in office environments that can lead to CTD are repetition, force, and awkward posture. These factors can be controlled by adjusting workstations to fit employees (changing work postures, reducing continuous repetitions, and stretching periodically). (See pp. 3-7 in this chapter for relaxation techniques to use for the office.)

To improve workstation ergonomics, work in neutral:

- ♦ Sit with the lower back against the chair and feet flat on the floor or on a footrest. Chairs should provide adjustable height, comfortable lumbar support, waterfall front (rounded), five legs (stability), fabric that breathes, and a comfortable seat pan and swivel.
- ♦ Adjust the table and chair so that elbows are bent at right angles (90 degrees) and forearms are approximately parallel to the floor.
- ♦ Place keyboards at approximately seated elbow height. Work with wrists straight. When typing let the wrists float above the wrist pad. When **not** typing, rest the wrists on the wrist pad. Keep wrists level. Avoid bending wrists up or down while typing. Do not rest wrists on the edge of the keyboard or table. This creates pressure points, which can cause injury.
- ♦ Place the mouse on a surface close to and at the same height as the keyboard. Using a padded wrist pad can help.
- ♦ Position the video monitor directly in front of you, approximately an arms length away (generally 18-30 inches), with the top of the screen slightly below eye level. Tip the monitor back at an angle similar to that used when reading a book.
- ♦ Use a document holder to position work at eye level. Document holders should be placed next to the video screen. The distance and eye level from screen and document holder to your face should be the same.
- ♦ Prevent glare on the video monitor by adjusting office lighting, using an anti-glare filter, placing the monitor perpendicular to a window, adjusting blinds, tilting screen, and/or adjusting color, brightness, and contrast for eye comfort. Ergonomic Evaluations are available through Environmental Health Services.

USE SAFE AND EFFICIENT WORK HABITS

- ♦ Reduce repetitions.
- ♦ Perform “break jobs.” These are non-computer related tasks, which can be performed as a rest job away from the computer (e.g., filing, telephoning, copying, etc.)
- ♦ Take more mini-breaks and fewer longer breaks.
- ♦ Practice stress-reduction techniques. (See pp. 3 through 7 in this chapter.)
- ♦ Use safe lifting techniques (See Chapter 2, pp. 2-8 and 2-9.)
- ♦ Alternate between standing and sitting. Stand with one foot elevated to reduce lower back stress.
- ♦ Minimize stress on the body. Use anti-fatigue mats at the copier. Use footrests. Use padded grips for pens.
- ♦ See GENERAL WORK RULES, Chapter 2, as well as Exercise and Relaxation Technique for the Office section on page three of this chapter.

Take care of your eyes

- ♦ Have periodic eye exams.
- ♦ Tell eye-care professionals about computer use.
- ♦ Exercise eye muscles to reduce strain (blink, look into the distance).

Perform Stretch Breaks

- ♦ Incorporate stretching exercises into your schedule.

Pursue a Healthy Lifestyle

- ♦ Exercise regularly
- ♦ Stretch and warm up before beginning exercise. Cool down at the end of the routine.
- ♦ Begin easy – exercise should not cause pain.
- ♦ Seek advice from your doctor before beginning any exercise regimen.

General Office Considerations

- ♦ Lighting should be comfortable. Adjust the level of lighting. Minimize reflective surfaces. Adjust blinds/curtain. Use task lighting.
- ♦ Use proper posture when talking on the phone. Keep neck straight. Use shoulder rests, speakerphone, and/or headset. Place phone within easy reach.

Efficient Workspace Organization

- ♦ Clean and organize equipment to fit your working needs.
- ♦ Keep frequently used items within easy reach – don't twist or stretch.

Noise Abatement Suggestions

- ♦ Reduce equipment noise (relocate printers).
- ♦ Keep coffee pot away from central work area.
- ♦ Encourage employees to direct conversation away from other non-involved employees.

Temperature Comfort

- ♦ Maintain comfortable working temperatures (The University maintains temperatures at 65 degrees Fahrenheit during the heating season and 83 degrees Fahrenheit during the cooling season).

One-third of the day is spent at work – make it a comfortable day!

EXERCISE AND RELAXATION TECHNIQUES FOR THE OFFICE

This section is for those workers who do most of the day's work at a computer terminal. Techniques discussed should be performed periodically during the workday for one to three minutes. If any of these exercises causes undue or prolonged pain, stop immediately! Examples of these techniques are as follows:

- ♦ Do eye massage around eyes
- ♦ Do palming exercises
- ♦ Do Deep Breathing Procedure eight times
- ♦ Raise arms forward, palms up, then palms down
- ♦ Massage hands and fingers

EYE RELAXATION

The eyes are one of the most highly sensitive parts of the body. Since they are an outgrowth of the brain, the eyes are also a primary outlet for stress. Muscles in and around the eyes are affected by the emotional states of your body. With close, intensive visual work of any kind, these muscles are likely to be in a state of chronic tension. Eyestrain is a common cause of headaches. You can work through eyestrain by doing a few eye relaxation techniques.

Palming

- ♦ Palming is an easy and effective exercise for relaxing eye muscles. Palming gives you a break from the smoke, artificial light, glare, movement, and drafts present in offices. By incorporating palming into workplace life-style, you will be increasing comfort and efficiency along with preventing many stress related symptoms.
- ♦ Brace yourself, using your elbows for support, so that no tension remains in your arms and shoulders. Let your weight fall forward to create slight pressure on the area surrounding your eyes. Cup your hands over your eyes by crossing over the bridge of your nose. No light should come in. Close your eyes. Take eight deep breaths through your nose and out your mouth. Focus on your inhalation/exhalation. Expose your eyes to light gradually.
- ♦ Palming should be done if your eyes are tired, burning, or irritated; when you feel a headache coming on; or when you feel stressed or fatigued.
- ♦ The next exercise helps you determine your dominant eye. This is important to know as your dominant eye fatigues sooner than your other eye. Performing additional massage and rest will help the dominant eye.

Your dominant eye can be detected by:

- Selecting an object across the room
- Making a circle with your thumb and index finger
- Extending your arm in front of you
- Looking at the object through the circle with both eyes open
- Without moving the circle, closing the left eye; then switching and closing the right eye.

The eye which still sees the object through the circle is dominant.

Focus Change

- ♦ The focus change technique can be done by looking at something near you and at something far away. Changing focus helps to alter the lens of your eye and keep your eyes flexible for all distances.

- ♦ Look at a photograph or book cover at close range. Then look across the room or out the window. Do this at least once every hour.
- ♦ Hold up a finger a few inches from your eyes. Focus on it. Slowly move it away from yourself. Focus into the distance, then back to the finger. Slowly bring the finger back to a few inches in front of your eyes. Repeat this activity two times.

Yawning

- ♦ Yawning can be beneficial because it increases circulation, relaxes and energizes the body. Yawning also lubricates your eyes, which helps during close visual work. Drop your jaw and inhale; usually a yawn will result. Yawn at least once an hour.

Blinking

- ♦ Blinking also helps the eyes stay moist. When your eyes blink infrequently, they become dry, tired, and strained. The normal eye blinks an average of three times every ten seconds. Blinks should be light, quick, and effortless. Remind yourself to blink when doing close work.
- ♦ Here are more eye relaxation exercises. They help the internal and external muscles to relax:
 - Close eyes; move eyes up to ceiling, then down to the floor; repeat three times. Rest.
 - Close eyes; move eyes left, then right; repeat three times. Rest.
 - Close eyes; make circles with eyes looking as far as you can go, to the side, down, and to the other side; change directions. Repeat.

Eye Massage

- ♦ This exercise can decrease visual tension quickly. For all eye massage, place elbows on the table as with palming. Close your eyes. Massage lightly; excessive pressure is not necessary. Press gently up between the bridge of the nose and eye. Hold five seconds. Use the thumb and index finger to massage the nose bridge. Press downward, then upward.
- ♦ Place thumbs on lower jaw and index and middle fingers against both sides of nose near nostrils. Lower the middle fingers and massage with index fingers. Using the thumb or side of the index finger, apply gentle pressure approximately every half inch in the area surrounding your eye.

Deep Breathing Procedure (DBP)

- ♦ We tend to breathe shallower when we are feeling stressed or when we are concentrating intensely. Even worse, we tend to hold our breath. Deep breathing oxygenates the blood and sets off a relaxation response throughout the body. With more oxygen circulating to the brain, mental alertness is improved also.
- ♦ The DBP procedure is as follows:
 - Relax
 - Inhale slowly through your nose trying to fill your abdomen first, then your entire rib cage
 - Hold for 5 seconds
 - Exhale slowly through your mouth, pulling your abdomen in and up
 - Concentrate on inhaling and exhaling completely
- ♦ The DBP combines eye rest, limbering, and breathing relaxation:
 - Let your head drop forward in a relaxed position

- Close your eyes
 - Slowly roll your head up and to the left, breathing in deeply until you face the ceiling
 - Slowly roll back to lowered position, breathing out
 - Relax
 - Repeat rolling head to right
 - Complete each side three times
- ♦ DBP routine combines sensible circulatory movement and breathing:
 - Go outdoors
 - Take three deep breaths using the DBP
 - Walk a short distance, alternating with a rapid and normal pace
 - Inhale for two steps; exhale for two steps
 - Gradually increase the length of a breath to four steps, then six.
 - ♦ Do the DBP at least once an hour when doing close visual work.

PROPER SITTING

Head

- ♦ Your head should be comfortably aligned so its support comes from the spine, not from neck and shoulder muscles. Whenever the weight of your head is off center of gravity, your neck and shoulder muscles stay contracted and the likelihood of headache and fatigue is increased.

NECK/SPINE

- ♦ Your neck and spine should be fairly straight and the lower back supported. This region is the focal point for many back problems because it carries the weight of your body and provides the leverage for twisting and bending. Lower back muscles are frequent targets of tension. Tucking in your abdomen automatically helps support your spine and back muscles.

ARMS/WRISTS

- ♦ Arms are comfortably held at about a 90-degree angle from the elbow. The position of your arms should not cause unnecessary stress and fatigue on the forearm, neck, and shoulder muscles.
- ♦ Wrists should be in an even line with the forearm. A bend either up or down may increase pressure on the median nerve and muscles involved in keying.

PELVIS/THIGHS

- ♦ Thighs should extend at about a 90-degree angle from the pelvis with another approximately 90-degree angle at the knees. This positioning ensures that blood flow is not diminished by pressure from your chair or desktop.

FEET

- ♦ Feet should be placed flat on the floor or on a footrest in order to achieve the recommended 90-degree angle alignment, maximum blood circulation, and muscle relaxation.

EXERCISE TO HELP YOUR POSTURE

The following exercises should begin with the posture described above. These exercises should help you to have correct posture naturally.

- ♦ Imagine a cable attached to the top of your head which is gradually pulling you up. Hold and relax. Raise your head in this manner three times.
- ♦ Slowly raise your shoulders upward to your ears. Bring shoulders down. Hold. Relax. Repeat three times.
- ♦ Lock your hands behind your head and stretch back in your chair. Arch back slightly and gently. Relax. Do three times.
- ♦ With your hands locked behind your head, pull elbows wide apart. Hold. Relax. Repeat three times.
- ♦ Raise knees one at a time about two inches. Hold three seconds. Relax. Repeat three times.
- ♦ Tighten your buttocks and abdominal muscles. Hold for five seconds. Relax. Repeat three times.
- ♦ Tilt pelvis forward and back. Hold for three seconds. Relax. Repeat three times.

LIMBERING EXERCISES

These exercises can help you to fight the sedentary life of the office. These exercises will help range of motion and break the cycle of aches and pains caused by restricted movement, which brings on less flexibility and more aches and pains.

Neck / Head

- ♦ The neck needs to be exercised regularly to relieve muscle tension that builds up throughout the workday. By stretching muscles and stimulating circulation in this area, you increase flexibility, reduce stiffness and pain, and help to prevent “terminal slouch” and fatigue.
- ♦ Range of motion exercises for the neck and head help. When the neck is limber, you can turn your head through almost 240 degrees:
 - Begin with proper posture
 - Gently tip your head from side to side three times. Hold for three seconds. Stretch upward each time you return to center.
 - Gently turn your head and look over your shoulder while stretching upward. Hold three seconds; repeat three times.
 - Slowly drop your chin toward your chest three times. Relax three seconds. Raise your head slowly. Stretch upward.
 - Slowly tilt your head backward three times. Relax three seconds. Raise head slowly. Stretch upward. Do not roll and tilt your head backward as far as possible. This causes unnecessary wear on the vertebrae.

Shoulders/Arms/Wrists - Range of Motion

- ♦ Begin with proper posture.
- ♦ Lower your chin to your chest. Slowly make three circles with your shoulders, and then gradually tilt your head backward. Make three slow circles with your shoulders. Stretch upward and relax.
- ♦ Raise arms up and to the side, with palms facing out. Squeeze shoulder blades together. Hold for three seconds while breathing normally. Relax. Repeat three times.

- ◆ Extend arms straight ahead of you at shoulder level. Rotate them so the backs of your hands face each other. Hold. Then rotate them so the palms of your hands face upward. Hold. Rotate three times.
- ◆ Hold arms straight out in front. Make a gentle fist. Slowly point knuckles to the floor. Hold for a count of three. Slowly straighten out your fingers. Slowly point your fingers toward the ceiling. Hold for a count of three. Repeat three times.

Legs / Feet / Ankles

- ◆ Begin with proper posture.
- ◆ While sitting, slowly rotate each foot from ankles three times in one direction, then three times in the other direction. Relax. Do three times.
- ◆ While sitting, point toes downward as far as possible. Hold three seconds. Relax. Do three times.

TARGET MASSAGE

Target massage is a means of relaxing tight muscles that cause pressure and pain in areas of the body most affected by mental and physical stress. By massaging the following areas, you will help reduce stiffening and soreness that may occur periodically; circulation will improve and overall alertness and efficiency will increase. Please use these massages in a preventative fashion. Avoid “burn-out.”

Back of Head

- ◆ Brace forehead on hand with elbow resting on the desktop. Press with fingers or knuckles across the back of your head along the base of the skull to follow at the side of the neck. When using knuckles, roll back and forth pressing muscles to bond.

Forehead

- ◆ Use the same knuckle massage on your forehead, rolling and pressing gently the whole area from the hairline to eyebrows. Also, use flat extension of fingers to actually move forehead skin in a circular motion.

Side of Head

- ◆ Use knuckles or fingers on temples and curve around your ear. Press gently. Move scalp in circular motion from outside edge of your eye to area around base of your ear. Stretching your scalp at sore points enhances circulation.

Forearms

- ◆ Extend arms in front of you. Compress arm from elbow to wrist with thumb and index finger of opposite hand. Massage each arm three times.

Hands

- ◆ Gently massage the inside and outside of the hand by using your thumb and your fingers.

Fingers

- ◆ Gently massage each finger of both hands. Move toward nail gently. Massage space between fingers to widen and relax.