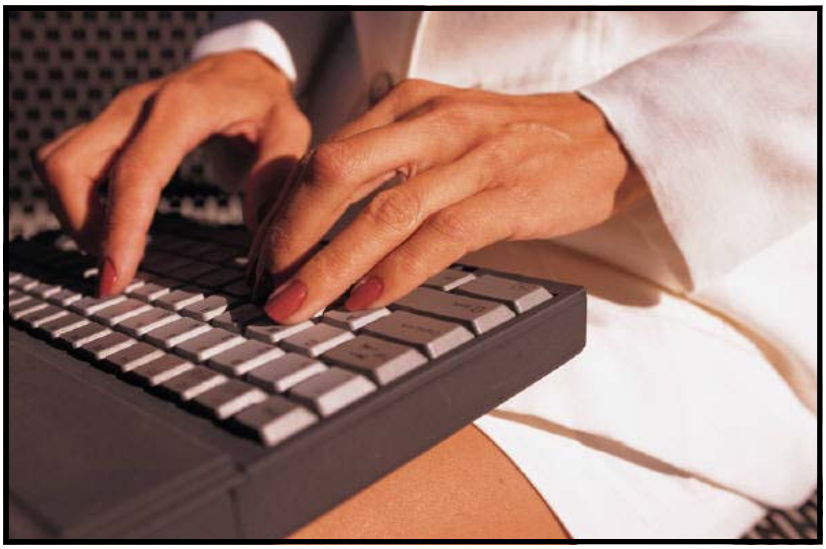
Ergonomics For Computer Users

An Employee Handbook



San Francisco Department of Public Health
Occupational Safety and Health Section
101 Grove Street, Room # 217
San Francisco, CA 94102

Employee Handbook

_____

My Name

_____

Department

_____

Location and Phone

The Ergonomic Coordinator For My Department is:

_____

_____

Phone #

Report signs or Symptoms of CTD's Immediately to:

_____

Supervisor's Name and Phone Number

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What is Ergonomics? Why is it Important?

Ergonomics is the science of looking at the different ways employees work and then adjusting their tasks, tools, and environment so they can work comfortably and productively. The emphasis is on making the work environment fit the worker rather than making the worker adapt to the work environment.

Ergonomics in the office environment has become more important as the use of computers has increased. Many of the varied office tasks that workers used to perform can now be accomplished on the computer, which has improved efficiency; but has created jobs that are more sedentary and repetitious. Some employees report increased feelings of physical and mental stress associated with computer use.

This handbook focuses on how to adjust your furniture and equipment, organize your work area and incorporate exercises into your work day to improve comfort and reduce the chance of becoming injured. Making these changes can make all the difference in how you feel at the end of the day.

Cumulative Trauma Disorders

Cumulative Trauma Disorders (CTD's) are a group of illnesses that can affect frequent computer users. CTD's are caused by the wear and tear of tendons, muscles, and sensitive nerve tissues caused by continuous use over an extended period of time. Two common CTD's are tendonitis and Carpal Tunnel Syndrome. Because CTD's occur over a long period of time; they often go undetected and untreated. Symptoms can take months or years to appear. Early symptoms can include pain, stiffness, tingling and numbness in the fingers, wrists, and arms.

Early medical intervention is extremely important. If you experience any of these symptoms, report them to your supervisor immediately.

Work Smarter...Not Harder

Working smarter, not harder, is the key to preventing CTD's. This means looking for ways to adjust your job to fit you, instead of you conforming to the job. Body Awareness, workstation design, alternating tasks, and taking frequent, short, stretch breaks can all help eliminate the risk of injury

Posture

Using poor postures is one of the main contributors to discomfort and injuries associated with office and computer work. Poor posture puts unnecessary stress on the back, neck, shoulders, wrists, and legs. Sitting for prolonged period of time using poor postures may cause fatigue, discomfort, and pain. Becoming more aware of our postures while we work is a key step to preventing injuries. Consider your posture at your computer:

Elements of Poor Posture

- Head and neck is bent forward or back
- Shoulders are hunched or raised
- Lower back is inadequately supported
- Wrists are bent out of the naturally straight position
- Arms are extended in front of or away from the sides of your body
- Thighs and knees are not parallel to floor
- Feet are not flat on the floor or on a footrest
- Arms are raised above shoulder level.

Elements of Neutral (Good) Posture

Good Postures Put the Least Amount of Stress on the Body

- When seated, both feet are flat on the floor or on a foot-rest; thighs are parallel to the floor
- Your back is supported in the lumbar curve
- Your head is upright and looking straight ahead
- Your arms hang naturally at your side with elbows bent approximately a 90 degree angle
- Wrist and forearm are straight when using a keyboard or mouse

Work Habits and Comfort

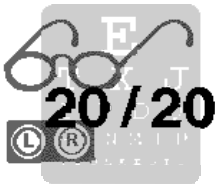
It is important to work in a neutral posture. This does not mean holding still or remaining perfectly straight while working. This simply means that you need to be aware of how you work. You must avoid excessive reaching and sustained awkward postures. It is important to vary work tasks throughout the day. When you are feeling tired or have lost the ability to concentrate, take a break or switch to another task. This will refresh your mind and allow your body time to recuperate

Computer Comfort

When using a computer, remember to take frequent, short breaks. Get up and move around every 30 minutes or so. Keep the keyboard and mouse close to your body. Practice using a light touch when using your keyboard. Repetition can also contribute to injury. Become aware of the repetitive motions you use while on the job and during your time off duty. Find ways to change these tasks to reduce the stress on your hands, wrists, and upper body. For example, use shortcut keys on your keyboard. This will reduce the number of times you hit the keyboard keys and mouse buttons while allowing the same amount of productivity. Use an electric stapler if you find yourself with many documents to staple.

Visual Comfort

Visual fatigue while working on a computer is common. Symptoms of tired eyes include blurred vision, difficulty focusing, dryness or soreness. Factors contributing to visual discomfort are lighting, glare, and monitor viewing distance.



Visual Comfort is an

Ideas to Reduce Visual Discomfort:

- Reduce glare by positioning the computer perpendicular to light sources.
- Use adjustable blinds on windows in your workspace.
- Tilt monitor away from overhead light sources.
- Use a task light if overhead lighting is insufficient.
- Direct task light onto the copy, not the computer.
- Use a monitor visor or glare screen.
- Adjust monitor color and contrast settings.
- Adjust the monitor to your appropriate viewing distance.
- Clean the view screen.

Visual Comfort

You will feel more comfortable if you can avoid long periods staring at the computer screen. Take frequent, short breaks. Practice the eye exercises on page of this publication. Take a few moments to relax and close your eyes. See your doctor on a regular basis for eye examinations. If you already wear glasses or contact lenses, ask your optometrist about computer glasses.

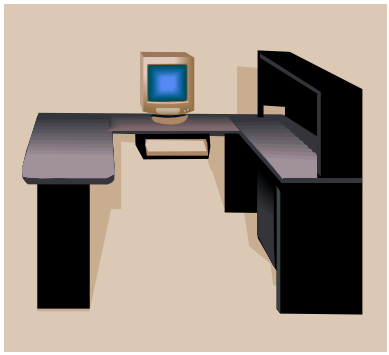
Workstation Design

One of the keys to preventing injury while at work is to keep your body in a neutral position while doing different tasks. It may be necessary to adjust your workstation to fit your body and the tasks that you regularly perform. Examine and evaluate your current workstation setup. Does it work for you?

Chair

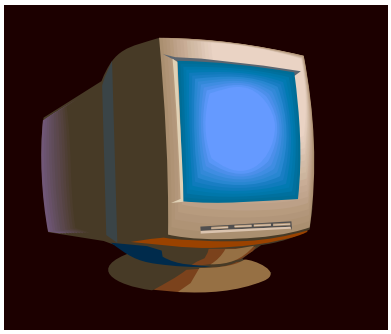
Your chair should be easily adjustable. Set the seat pan so that your feet are flat on the floor or footrest and that your thighs are parallel to the floor. The end of the seat pan should not press into the back of your knees. Adjust the angle and height of the chair back so that your lower back is supported. Use a rolled up towel or a pillow to provide additional support if needed.

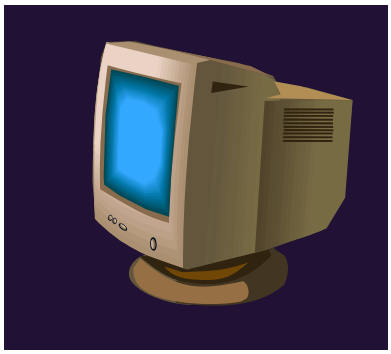
Work Surfaces



The work surface (desk, table, or keyboard platform) should be adjusted high enough to allow your legs to fit comfortably underneath and should be about the same height as your elbows. If the table is too high and cannot be adjusted, raise your chair and use a footrest. If your work area is cluttered, relocate or remove unnecessary items. Arrange the most frequently used items within easy reach to minimize excessive reaching and awkward postures.

Monitors





Place the monitor directly in front of you to avoid having to bend or twist your neck. The monitor position should allow your head to be balanced comfortably over your shoulders. Adjust the monitor height so that the top of the screen is at or below eye level. In general, the monitor screen should be either parallel to your face or have a slight upward tilt. The monitor distance should be about 16 to 30 inches from your eyes.

Keyboards and the Mouse

While using a keyboard or mouse, keep wrists straight and work with your elbows relaxed at your side. Use a wrist rest to support your hands during a typing pause or break. Move wrists freely...do not plant them on the wrist rest or the edge of your desk or work surface. Planting your wrists in one location creates pressure that could contribute to a CTD.

Copy Holders

Copy holders can help prevent neck and eye strain by reducing the range of motion needed to move eyes from the copy to the computer. Copy holders can either be placed directly in front of you, just below the monitor screen, or next to the screen at the same height and distance as the screen. Copy holders are a necessity for those who spend long hours entering data from source documents.

Lighting

Your workstation should have adequate light to view documents. Since offices with overhead fluorescent lighting don't always provide every person with good lighting, a task light may help in your work area. You can also adjust the controls on your monitor, such as the brightness and contrast for visual comfort.

Office Stretches

It is important to stretch after sitting or working on the computer for prolonged periods of time. Periodic stretching or exercise will prevent fatigue and relax and rejuvenate your body and mind. The following are stretches that can be done at your workstation.

Calf Pumps

While standing, hold onto something secure with your hands. Raise up onto your toes.

Benefits: Improves foot, ankle, and calf circulation and strength.

Upper Body Stretch

Standing or sitting, grasp your hands behind your head, keeping your head straight, your knees shoulder width apart, ad your feet flat on the floor. Pull your elbows back. Hold and released.

Benefits: Relaxes bent over posture from sitting or lifting.

Note: Do not do this exercise if you have shoulder problems.

Arm and Wrist Stretch

Standing with your arms at your sides and your elbows straight, move your arms out from your body about 45 degrees. Slowly turn your arms so that the palms face outward and wrists are rotated back until you fell a stretch in the inside of your elbow.

Benefits: Elbow, forearm, and wrist stretch.

Finger Wiggles

Sitting or standing with your arms hanging naturally at your sides, wiggle your fingers while rotating your wrists and elbows forward and then backwards.

Benefits: Increases circulation to hands and fingers.

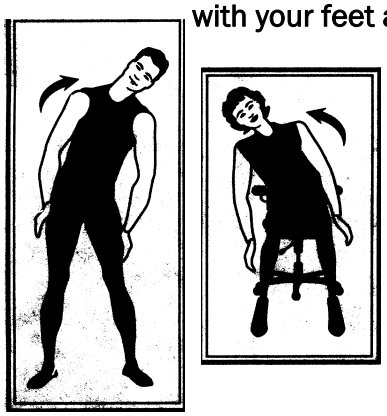
Chin to Chest

Standing or sitting, curl your neck so that your chin lowers to your chest or when you feel a stretch in your neck. Turn your chin toward your shoulder, then tilt chin back toward chest.

Benefits: Relaxes neck muscles, stretches the upper back and neck muscles.

Side Bending

Standing or sitting with your arms relaxed at your side and with your feet about shoulder width apart, slowly and gently lean to one side directly over your hips. Hold until you feel a stretch in your side and neck. Slowly return to the upright position.



Benefits: Stretches the back and lateral abdominal muscles and the neck muscles.

Elbow Stretches

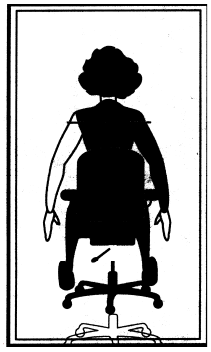
1 Standing or sitting with your elbows at your sides, straighten your elbows and rotate your arms so that your elbows and palms of the hands are facing away from your body.

2 Standing or sitting with your elbows at your sides, straighten your elbows and bend your wrists toward you elbow and then away from elbow.

3 Standing or sitting with your elbows at your sides, raise your arms together at chest height in front of your body and bend both wrists so that the back of the wrists touch.

Benefits: Forearm and wrist stretch.

Shoulder Squeezes



One of the keys to preventing injury while at work is to stand or sit with your arms at your sides, move your shoulders down and back, pinching the shoulder blades together and expanding the chest.

Benefits: Stretches the chest and muscles around the shoulder blades.

Eye Exercises

You will feel more comfortable if you can avoid long periods staring at the computer screen. Take frequent, short breaks. Practice the eye exercises below. Take a few moments to relax and close your eyes. See your doctor on a regular basis for eye examinations. If you already wear glasses or contact lenses, ask your optometrist about computer glasses.

Cup Your Eyes

Lean your elbows on your desk. Cup your hands and place them lightly over your closed eyes. Hold for a minute while breathing slowly in and out.

Roll Your Eyes

Close your eyes and slowly roll your eyeballs clockwise all the way around. Repeat 3 times. Roll them counter clockwise 3 times.

Look Away

Every 30 minutes or so, look away from the computer screen and focus on a distant object at least 20 feet or more away for 30 seconds.

Hand Exercises

1. In a standing position, open your hand and spread your fingers. Gently press your hand, palm down, against the table to stretch the fingers and wrist.
2. Tightly clench your hand and then release, fanning out your fingers. Repeat five times.

Ergonomic Problem Solver

After adjusting your workspace to fit you, your discomfort should decrease. If you still have some problem areas, try making some of the adjustments recommended below:

Problem Area	Change Workspace Design	Change the Way You Work	Stretch Your Muscles
Back and Lumbar Area	• Readjust Chair (or use additional pillow for lumbar support) • Use a footrest to support legs	• Keep feet flat on the floor or use foot rest. • Keep knees and thighs parallel to the floor. • Change positions frequently. • Stand and move around at least every 30 minutes. • Walk or stretch during your breaks. • Stand for tasks that don't require you to sit (using the phone). • Sit up straight, don't round shoulders or slouch.	• Side bending • Shoulder squeezes
Neck and Shoulders	• Maintain a neutral posture, adjust chair if needed. • Adjust monitor to at or below eye level. • Place documents in a document holder next to or just below screen. • Adjust keyboard height to keep elbow bent at about a 90 degree angle. • Keep mouse close to keyboard. • Keep frequently used tools nearby to avoid long reaches.	• Hold head above shoulders and look straight ahead. • Keep elbows at your sides and bent at a 90 degree angle. • Use speakerphone or a headset for long or frequent phone use.	• Shoulder rolls • Chin to chest • Shoulder squeezes

Problem Area	Change Work-space Design	Change the Way You Work	Stretch Your Muscles
Arms and Wrists	• Adjust keyboard to keep wrists straight. • Adjust the height of the work surface or keyboard to keep the elbows bent at a 90 degree angle. • Use a wrist support if needed. • Place frequently used items closer to you to avoid reaching. • Raise chair to keep elbows at a 90 degree angle while at keyboard. • Keep mouse close to keyboard.	• Take frequent breaks. • Do not rest wrists on a hard surface or against sharp edges. • Alternate your keyboarding work with other tasks.	• Arm and Wrist Stretch • Finger Wiggles
Eyes	• Reduce screen glare or flicker. • Adjust room lighting or use task lighting. • Clean computer screen. • Use window shades. • Place computer station perpendicular to window to reduce glare and reflections.	• Periodically look away from monitor and focus on distant objects. • Adjust monitor height and distance to increase comfort. • See an optometrist if you notice any changes in your vision.	• Cup 'em, Roll 'em, and Look Away. • Blink Frequently. • Focus on distant objects.

Computer Workstation Inspection Checklist

The purpose of this checklist is to provide you with information for setting up your computer workstation to reduce awkward postures, promote comfort, reduce the risk of injury and improve satisfaction with your work and work space. Mark a ✓ in the designated column to remember which items you have already looked at. Keep in mind that changes may feel uncomfortable or awkward at first. It may take a week or two before they feel natural.

What to Check	Adjustment Guidelines	✓	Comments
CHAIR **Seat height**	• Adjust seat height so that feet are flat on the ground or on a foot rest. Your thighs should be parallel to the floor.		Foot supports can be used if the chair height cannot be lowered due to limitations of the chair or positioning of the keyboard. Temporary foot rests can be old phone books or boxes.
Back rest height	• The back rest should be adjusted to provide lumbar support. If the back support can be raised, place the curved portion in alignment with the curve in your lower back (lumbar area).		If your chair does not provide good lower back support, try using a lumbar cushion or locating another chair. Inexpensive ideas for making a lumbar cushion include: a rolled up towel, a small pillow or rolled up bubble wrap from packaging.
Back rest angle	• If the backrest can be adjusted forward and backward, position the backrest so that you have good support when performing keyboard work. The angle created by your body and thighs should be 90 degrees or greater.		You should be able to relax your lower back against the back rest when seated firmly back in the chair.

What to Check	Adjustment Guidelines	✓	Comments
Leg Comfort	• Check to see if you have space between the back of your knees and the front edge of your chair when seated normally. The front edge of the chair should not interfere with your lower leg position.		If the front edge of the seat touches the back of your leg or knees, try lowering your chair slightly or raising your feet with a footrest. Using a lumbar cushion will also help you sit further forward in your chair.
Other adjustments	• If your chair has other adjustments (seat tilt, arm rests, etc.), experiment to find the most comfortable settings.		
Posture	• Change your posture frequently during the day. Minor chair adjustments can relieve some muscle stress and stiffness.		
KEYBOARD **Keyboard height**	• The keyboard height should be adjusted at about seated elbow height. Your wrists should be straight (neutral position). • Work with your body close to your keyboard to avoid loading your shoulders caused by extending arms to reach the keyboard. Try to keep elbows close tot he body and in vertical alignment with your shoulders (avoid “chicken wings” postures). Relax your shoulders.		If you have an adjustable height/angle keyboard support, learn how to use the adjustment leaves beneath the tray. If your keyboard I so a table that cannot be adjusted, you may need to raise your chair and use a footrest in order to work with the keyboard at elbow height.

What to Check	Adjustment Guidelines	✓	Comments
Keyboard Angle	• Adjust the keyboard angle to promote straight wrists. For some people, this means a flat or slightly negatively tilted keyboard.		Avoid using the "legs" on the keyboard if they cause your wrists to bend up while typing.
Arm rests and keyboards	• If you rest your elbows on the chair arm rests, make sure that the arm position has a positive influence on your posture. If possible, adjust the arm rest height to promote relaxed elbow and shoulder positions.		Chairs with arms may actually promote bad postures by preventing you from moving close to the keyboard (because they hit the keyboard support desk) or the arms may be too wide/low/high, causing you to maintain a bad posture reach the arm rests. In some cases, it may be better to remove the chair arms or make modifications like adding foam cushions to increase the arm height.
MOUSE	• Position your mouse as close as possible to your keyboard to prevent excessive reaches. • Try alternating use of the mouse with your other hand. • Place the mouse on the same level as your keyboard.		Learn to use shortcut keys to reduce your mouse usage. Avoid clenching your mouse tightly. There are many ways to increase the amount of space in your work area to allow more room for your mouse. Contact the OSH section for some ideas.

What to Check	Adjustment Guidelines	✓	Comments
MONITOR **Monitor height**	• The top of your monitor should be at or below eye level when you are seated to prevent bent neck or shoulder postures. If you wear bifocals, the monitor may be placed even lower. • Adjusting the monitor height may require the CPU (central processing unit) and placing it to the side of the monitor or beneath the desk.		Have someone help you determine if the monitor is correctly placed. It is sometimes difficult to assess this yourself. Inexpensive ideas for adjusting your monitor height include: using phone books or reams of paper.
Monitor Distance	• The distance from your eyes to the monitor is usually between 16 and 30 inches. The exact distance will depend on what is a comfortable viewing distance for you.		If your monitor height is outside of this range check to see if there are other factors that are influencing the monitor location.
COPY HOLDERS	• Documents that you are typing from should be placed in a copy holder.		Place the document holder at the same distance from your eyes as the monitor and as close to the monitor as possible. The document holder can be slightly below the screen or to the side of the screen.

What to Check	Adjustment Guidelines	✓	Comments
WRIST RESTS and MOUSE PADS	• Use a wrist rest to help support good wrist postures and to prevent resting your wrists on a hard surface. Be careful not plant your wrists on the wrist rests while typing. • Mouse pads should be used to provide a cushion if you rest your wrist rests on the desk surface when mousing.		Wrist rests should be slightly curved, made of a cushioned material and made with a covering which minimizes friction. DO NOT rest your wrist on a hard surface.
LIGHTING **Screen Orientation** **Glare screens** **Task lighting**	• Task lighting that highlights your document, not your screen, can improve visual comfort. • If you have glare or reflection on your screen, try to orient your monitor so that it is perpendicular to the light source and/or try using a glare screen. If the glare is caused by over head lighting, adjust the tilt of your screen so that it is neutral or slightly tilted downward. • Close blinds and shades to eliminate outdoor light reflections and reduce background lighting.		Try adjusting the contrast and brightness levels on your monitor to find the setting that gives you the least visual comfort. Clean your monitor screen frequently with appropriate cleaners to improve character resolution and clarity.
CLEARANCES	• Make sure that there is adequate clearance under your desk for your feet, knees, and the chair legs.		

What to Check	Adjustment Guidelines	✓	Comments
BREAKS	• It is very important to take frequent, alternative work breaks after working at your computer continuously for more than an hour at a time.		Take breaks before you start to fell tired. Work breaks will help prevent fatigue and reduce visual and muscular stress.
EXERCISE AND STRETCHING	• Perform periodic exercises to relieve stress when working at a computer or sitting for a prolonged period of time.		See the stretches section in this handbook for ideas.
WORK AREA ORGANIZATION	• Place most commonly used items, such as adding machines, pens, staplers and resource documents within an easy comfortable reach.		Always turn your body completely to face the material you are reaching for instead of twisting your torso or using extended reaches to get items.
TELEPHONES	• Place your telephone on the desktop close to where you work most frequently. • Use a headset or speakerphone if extended phone time is required.		NEVER hold the phone pinched between your neck and shoulder.

NOTES

An Employee Handbook

Occupational Safety & Health
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94102

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WE'RE ON THE WEB:
DPH.NET

Additional Resources Courtesy of OSH