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Workers' Compensation Insurance Specialists

Loss Control
Workstation Ergonomics

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Staying Healthy on the Job

Anyone who spends much of their time sitting at a computer can feel better and work smarter by following the guidelines of a structured ergonomic program. The repetitive nature of data entry can lead to painful musculoskeletal injuries that can easily be prevented with basic training and adjustable equipment.

The guidelines that follow will help you set up an ergonomically correct workstation. These guidelines are directed to both the employer and employee. Keep in mind that individuals and jobs are different, so the solutions you implement (or follow) may vary by workstation and circumstance. These general guidelines are a good starting point to help make workers more comfortable at their desks. If you have questions, the Loss Control consultants at Republic Indemnity can provide assistance. To request loss control service, please call our toll free number at 800-821-4520, option 8, or send an email to RICALC@ri-net.com.

It's important to recognize that ergonomic risk factors exist outside the office. When using personal computers and laptops at home, equipment and workstations need to be adjusted similarly to office workstations. In addition, many leisure activities also involve ergonomic risk factors. Keeping yourself healthy may require that you evaluate both your workstyle and lifestyle. You may have to try more than one change to see what works best for you.

Requirements of a Successful Ergonomic Program

Both you and your employer must be fully committed to implementing and following an ergonomic program. You and your employer will each have specific responsibilities to ensure the program is working. It's your job to follow your employer's recommendations, but here's what your employer will be doing:

- Securing the commitment and financial support of top management so that ergonomically designed equipment can be purchased when necessary.
- Training personnel to conduct workstation evaluations to achieve safe, comfortable working conditions for employees.
- Performing workstation evaluations for new employees within the first few days of starting employment.
- Establishing open communication that permits employees to report pain and discomfort early, before an actual injury has incurred.
- Maintaining instruction records for all adjustable equipment on site to facilitate training of staff.
- Maintaining records of all training provided to employees.
- Following up with employees after a workstation evaluation has been performed.
- Encouraging frequent mini-breaks to allow brief hand, wrist, and eye exercises.
- Providing written training materials.

Workstation Risk Factors

You and your employer must be committed to following the guidelines in your ergonomic program that address each of the five major workstation risk factors. As you read through this guidebook, you'll see where specific guidelines are designed to address each of these five risk factors:

1. Posture

Posture is the position of your body while seated at your desk. Awkward posture is associated with an increased risk for injury. It is generally considered that the more a joint deviates from the neutral (natural) position, the greater the risk of injury. Posture issues can be created by work methods (bending, twisting, and reaching) or workstation equipment positioning.

Maintaining good posture on the job involves all the equipment in your workstation: panel display, mouse, keyboard, chair, and desktop area. You'll find instructions on adjusting each of these within this guidebook.

2. Force

There are two primary forces required for you to complete your work tasks: the force your body exerts against itself, like muscle, tendon, or joint stress, and the force your body exerts against an external object, like a keyboard or chair. The greater the force, the greater the chance of injury.

Desk accessories such as keyboard rests, split keyboards, detachable number pads, and other equipment can help minimize the force exerted against your arms and hands while using the computer. Properly designed and adjusted chairs can minimize the force against your back and legs while seated at your desk. *To learn how to adjust this equipment, see pages 9-10.*

3. Repetition

Repetition is the number of times you perform the same, or similar task. Generally, the greater the number of repetitions, the greater the degree of risk. For example, office workers can be troubled by repetitive motion injuries to the hands and wrists from improperly positioned keyboards. Minimizing work that requires use of your mouse can also help reduce exposure to Repetitive Motion Injuries (RMI).

- Whenever possible, use/purchase software that allows the use of the "tab key" and "arrow keys" and automatic advancement to the next entry field to navigate through the screen. This can greatly reduce use of the mouse.
- The use of software that automatically introduces a pause in data entry to enable an exercise break can also be helpful in reducing RMI.
- Avoid using side panel navigation, vertical and horizontal "scroll bars".
- In general, bad software design that emphasizes the use of a mouse can be costly from the point of view of injury costs and lost productivity.

4. Duration

Duration is the minutes or hours per day the worker is exposed to a risk. Generally speaking, the longer you keep your body in the same position doing the same activity, the greater your risk of injury. As duration increases, repetition and force also increase; as a result, proper posture must be maintained to keep you comfortable while working. When you move or adjust your furniture and equipment, you are making adjustments to obtain proper posture. An adjustable chair and keyboard tray allow a wider range of adjustments to establish and maintain proper posture.

Breaks should be taken to control the duration of the tasks you are completing. Microbreaks (less than two minutes) can be taken just by changing the work task and the muscles that are being used. For example, making a phone call or walking to the printer is a microbreak. Generally, you should take a brief rest break every 30 to 60 minutes. Move around, stretch, or do some other activity. This is particularly important if you have been sitting for two hours or more without a break. *Refer to exercise examples on page 27.*

Give your eyes a break by looking up from the computer screen every 15 minutes or so. Look at something at least 20 feet away and remember to blink. Most people blink less when looking at a computer screen resulting in the eyes becoming dry. Blinking refreshes the tear film and wets the eye surface.

5. Environment

Environmental conditions such as lighting, ventilation, and noise should also be considered. Anti-glare screens can be used to reduce glare on panel displays. It is better not to have a screen back to a bright window or facing a bright window. In most office environments, noise and lighting are not high-risk factors, but be sure to notify your supervisor if these are an issue for you.

Workstation Design

The Chair

For many people working at a computer the biggest ergonomic risk comes from sitting for long periods of time. A properly adjusted chair is essential in maintaining proper posture and comfort. The chair is the one piece of office equipment that can offer the widest range of adjustment possibilities, but surprisingly, the chair is also the equipment that employees are least familiar with.

The typical office chair can be purchased in three different height ranges. Chairs can also be purchased to accommodate small-to-large-framed individuals.

- Standard – 16 to 21 inches
- High – 19 to 23 inches
- Low – 14.5 to 19 inches

To provide proper posture and comfort for the person, a chair should have these five ergonomic adjustments: (*figure 1*)

- Seat height adjustments
- Backrest (lumbar) height
- Backrest tilt
- Seat pan tilt and depth
- Armrest adjustments

figure 1

modern chair design

Design considerations for chairs have been codified into standards. ISO 9241, "Ergonomics of Human System Interaction — Part 5: Workstation Layout and Posture Requirements" is most commonly used for modern chair design. The Business and Institutional Furniture Manufacturer's Association (BIFMA) provides guidelines for testing of commercial-grade chairs.

Adjusting Your Chair

It's important that you become familiar with all control levers provided on your chair. New chairs are usually delivered with instructions on how to use the various control levers to make adjustments for the seating comfort of the user. Keep a copy of these instructions at your desk and maintain a separate copy in company records. Taping a copy of the chair adjustment instructions to the underside of the chair is a good idea. Over time, your company will likely purchase different styles of chairs. They'll need to provide those instructions to new employees as they come on board. One of the most common reasons employees experience discomfort and injury is that they're sitting in a chair that has not been adjusted properly.

- When adjusting a chair, you should be able to make all adjustments from a sitting position. Seat height of the chair should be adjusted so that a person's feet are flat on the floor. This adjustment may change depending on the height of the heels on the shoes being worn. If a person's feet cannot be placed flat on the floor when the chair is properly adjusted for the keyboard, a footrest is recommended. *(figure 2)*

- The backrest or lumbar support should be adjusted up or down so that it fits your lower back just above the buttocks. This will help reduce the pressure on the lower back.

- The backrest can be allowed to "float" with your movements or be locked into position, depending on the task being performed. It is important to know that if the backrest is not locked in position and the tension is too soft, the backrest may allow you to lean back too far, causing you to over-reach for the keyboard. If it is locked in position, a slightly reclining position is usually preferred.

- The seat pan depth can be adjusted by sliding the seat pan forward or backward. You should not sit at the front edge of the seat on a regular basis. Doing so leaves your back unsupported. When properly adjusted, the front edge of the seat pan should be about two inches behind your knee.

- The seat pan tilt can be adjusted so that a person's knees are level with their hips, slightly below, or slightly above. For tasks that cause you to lean forward, such as writing on the desk, a position with the seat pan tilted slightly downward may relieve pressure on the back.

figure 2

- Armrests should adjust up-and-down, in-and-out sideways, or be removable. Armrests should not hit the keyboard holder or desk. If this happens, this could cause the person to compensate by sitting farther back and overreaching for the keyboard. When typing on the keyboard, your arms should float above the armrests and not be resting on them, and your elbows should be at your side.

- Although not an ergonomic adjustment, the chair should have a five-leg base to provide stability against tipping over.

Alternative Chair Designs

Some non-traditional chair designs have been recently introduced in the workplace. These include kneeling chairs, exercise balls, saddle chairs, sit-stand stools, or others. There isn't much evidence that suggests these are better than a regular chair that has been properly adjusted. While the standard office chair will accommodate a certain range of adjustments, manufacturers can provide smaller or bigger chairs to accommodate people of different weight and stature.

Before making a final decision about which chair to buy, always ask the supplier if you can try it out first. This is the best way to learn if the chair is the right one for you.

Alternative Workstations

It's widely known that sitting for long periods can increase the risk of heart disease and other medical problems – even if you exercise regularly. Also, standing for a long time while you are working can put stress on your back because the muscle groups in your legs, hips, back, and neck are tensed.

A good ergonomic practice is to adopt a variety of comfortable postures throughout your workday. Many workers can avoid prolonged sitting and be healthier by getting up and moving for a few minutes or more during the day. Microbreaks every 20 to 30 minutes will improve levels of comfort and reduce the risk of musculoskeletal injuries. However, some workers may prefer to have a sit-stand workstation, especially those workers who experience pain or discomfort when sitting for 30 minutes or less.

Using a Sit-Stand Workstation

Having the option to move between sitting and standing positions can help workers maintain comfortable working postures. If you are provided with a standing workstation, it's important to acquire training on the ergonomically correct way of setting up and using your desk.

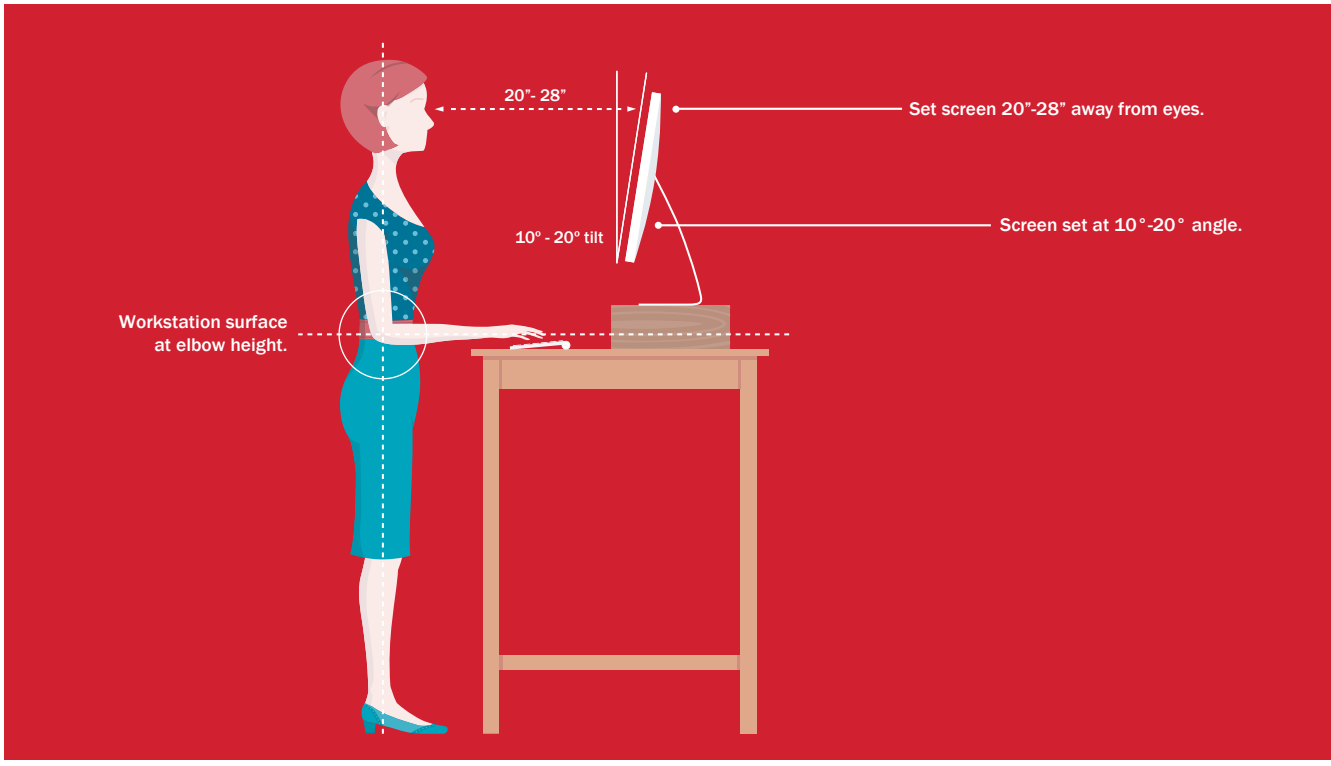
Here are some important tips on properly using a sit-stand workstation:

- If you have a dedicated ergonomics person at your workplace, ask the person for assistance in setting up your workstation.
- Consider getting an anti-fatigue mat to cushion your feet.
- Wear comfortable cushioned shoes with appropriate inserts.
- Begin slowly by frequently alternating between standing and sitting.

A good sit-stand workstation is height adjustable and can accommodate all users. It should also include these features:

- Easy-to-adjust components.
- A height-adjustable desktop with a height-adjustable keyboard tray that will fit sitting and standing users.
- A monitor platform or arm that allows the top of the monitor to be set at the same height as the user's eyes.
- A keyboard and mouse at the same height that can be set at or slightly below elbow height.

Employees may want to post this diagram by their workstations.



The Mouse

The computer mouse is an efficient, easy to use, and indispensable labor-saving device. It comes in various sizes and shapes and typically includes a wheel and two buttons. Moving the mouse translates into a motion of the pointer on the computer display and greatly reduces or eliminates the need of keystrokes to move the cursor within a spreadsheet or document.

The three-button scroll-wheel mouse is the most common model available, but there are alternatives such as touch pads, trackballs, joysticks, pens, and vertical mice that use the handshake position. They can be mechanical, optical, laser, or inertial, and can be controlled by your hand, foot, finger, or head. A mouse can either be wired or wirelessly connected to a computer. *(figure 3)*

The extensive use of the computer for work and the Internet has provided evidence that suggests that computer mouse use is associated with upper extremity musculoskeletal disorders. People who reported discomfort in their hand and thumb while holding the mouse had one or more of the following issues:

- Poor wrist posture (too much extension[1] and pronation[2]).
- One shoulder was turned outward.
- Arm extension was too far.
- The thumb was overused while moving the cursor.

1. ***Extension*** *of the wrist and arm refers to straightening the arm and wrist so as to extend the reach of the hand to a maximum and uncomfortable position.*

2. ***Pronation*** *as applied to the hand, refers to turning the palm backward (posteriorly) or downward, by medial rotation of the forearm.*

figure 3

The following user tips can help prevent the development of musculoskeletal disorders.

Equipment Options

- For most people, a mouse that fits the operating hand and is as flat as possible will reduce wrist extension.
- A symmetrical-shaped mouse will reduce pronation and a larger, flatter mouse encourages arm movements rather than wrist movements.
- A trackball mouse may be useful when space is limited, but its shape can increase wrist extension.
- A keyboard designed with the mouse device or touchpad incorporated in the middle of the keyboard can reduce reaching and keep the mouse at the body's midline. (*figure 4*)
- A wireless mouse can enhance the placement of the mouse and help keep the hand movement close to the body's centerline.
- A programmable mouse allows the user to customize the mouse for certain specific tasks. For example, a common change is to increase the pointer speed. This reduces the amount of mouse movement needed to move the pointer on the display.

figure 4

Positioning for Comfort

To avoid discomfort when using the mouse, there are some general guidelines to follow in positioning the mouse at a workstation. The location of the mouse during use in relation to the body's centerline affects the user's comfort level. The farther from the centerline, the more deviated shoulder and wrist postures may occur usually turning outward to the right (if right dominant and the opposite if left dominant).

- The mouse should be positioned next to the keyboard — right side for right dominant and left side for left dominant.
- Ideally, the hand should be just above elbow level when resting on the mouse to reduce extension of the wrist. *(figure 5)*
- If you don't use the numeric pad very often, it's possible to place the mouse closer to the body's centerline with the use of a mouse bridge or adjustable platform that sits above the numeric keypad. Both of these devices can be moved if the numeric pad is needed or the top row number keys can be used.
- When using the mouse, hold it lightly with your thumb and little finger. There's no need to squeeze hard. Gripping the mouse too tightly increases force and stress on the muscles.
- Relax your hand and lay it flat on the mouse.
- Avoid flicking the wrist to the left and right when moving the mouse.
- Your wrist should remain straight and controlled movements should be made from the elbow as the pivot point.
- Your elbow should be located at your side and should not be resting on the chair armrest.

Do not use a wrist rest or place your forearm on a chair armrest while using the mouse. Research has shown that a wrist rest can increase the pressure on the carpel tunnel. Using either or both of these resting surfaces while using the mouse can lead to movements made by flicking the wrist rather than moving from the elbow because the forearm and wrist become locked into position.

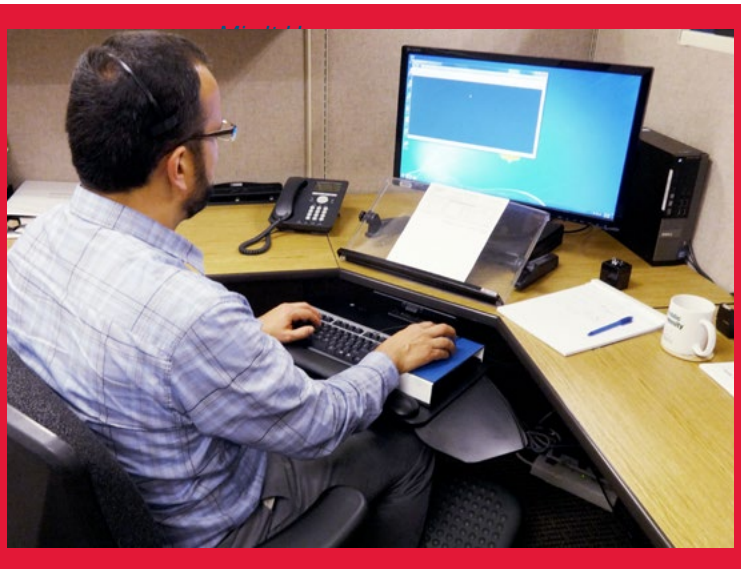


figure 5

Frequently used accessories such as calculators, manuals, staplers, etc., should be kept within the primary work zone, so they can be reached comfortably. See figure 10 on page 18.

Mix It Up

Sharing the workload between your right and left hand is a good method to reduce duration, but you will need a keyboard or mouse platform that can be easily configured for the left or right hand. In some instances, alternative key movements can be used rather than the mouse in order to rest your hand, e.g., page up, page down, and arrow keys to move the pointer.

For tasks with longer duration such as browsing the Internet, you may be able to shift the keyboard to the left (if right hand dominant) or to the right (if left hand dominant) and bring the mouse closer to the body's midline.

Many studies have looked at the different types of mice and the results of various postures with each mouse, but these studies have not determined a preferred size or shape. Position the mouse correctly and assess the tasks you do with the mouse to find the right one. With the many choices, it's always a good idea to first try out a mouse before buying. No one's preferences are the same. Find what works best for you.

A programmable mouse can make some tasks easier. For example, if you must click and drag repeatedly, the mouse can be programmed to click and hold the item until it is in place, rather than having to hold down the mouse button while dragging. This procedure helps to reduce awkward postures and force. You may want to consider a wireless mouse. (*figure 6*)

Proper cleaning and adjustment of your mouse/ball mechanism will help to eliminate unnecessary mouse movements and minimize the force needed to generate movements.

figure 6

The Keyboard and Panel Display

Keyboard

Adjusting the keyboard tray will allow you to maintain proper posture relative to your forearms and wrists. A good starting point is to lower the keyboard tray to a point just above your thighs. From this point, raise the keyboard tray until your forearms are parallel to the floor and your wrists are maintained in a flat posture when typing. Tighten the tray so that it does not move. Remember to float your hands when typing. Do not rest your hands on the wrist rest when typing. If you prefer to set the keyboard on the desk, you will likely have to raise the height of your chair to maintain proper posture in your forearms and wrists. If your feet then do not reach the floor, you will need a footrest.

The user should be centered on the alphanumeric keyboard. If the outer edges of the keyboard are used as references for centering the keyboard and panel display, your hands may be deviated because the alphanumeric keys will be to the left of your midline. A better reference is the space between the B and N keys. Center your body on these keys. The keyboard feet should be folded up rather than extended.

For some users, split-keyboards, left-handed keyboards or detachable number pads may be beneficial. Split keyboards with the alphanumeric keys split at an angle are one of the more popular keyboard alternatives. (*figure 7)* If you must hold your elbows outward, rather than close to the body, in order to maintain a straight wrist on the keys, a slanted keyboard may be inappropriate.

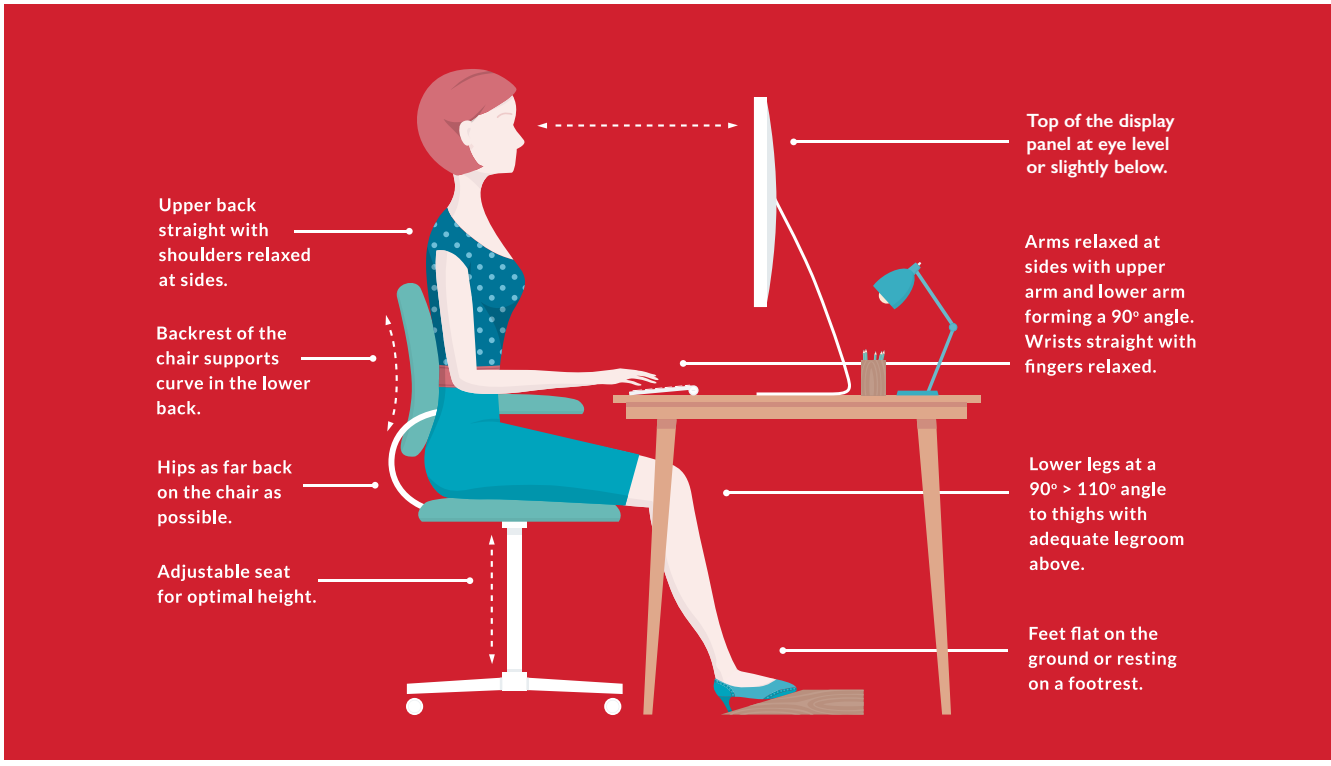
figure 7

The Panel Display

The panel display and keyboard should be positioned in line with your body. The height and distance will vary by user, but a good starting point is to have your eyes in line with the viewable screen and at a minimum distance that is equal to the display of the monitor. (For example, for a 20-inch display, your eyes should be at least 20 inches away from the screen.) Your head should be held in a natural, up-right position looking straight ahead at the screen and you should be sitting back in your chair against the seat-back. You should not be looking down or up to see the screen. The center of the screen should be 15-17 degrees below horizontal eye level.
See workstation drawing below.

The height of the panel display may change if you wear glasses. For example, if you wear bifocals, the screen may be positioned lower than normal. The distance will vary depending on the font size, color, and type of work. If you cannot read the print, it's better to use a larger font or magnify the screen image rather than move the display too close to you, which may cause your eyes to have difficulty focusing (convergence problems). Text characters should look sharp and the screen should not flicker. Dark text on a light background works best for typing. If you are having vision problems, an eye examination is recommended.

Employees may want to post this diagram by their workstations.



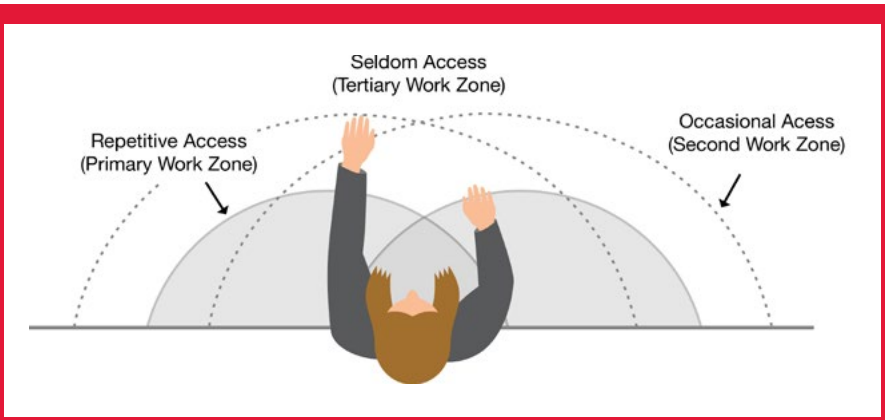
Work Zones

Your desk space can be divided into three work zones: primary, secondary, and tertiary. Make sure the equipment you use is located in the appropriate zone to minimize stress from reaching and stretching. *(figure 8)*

- Primary work zone extends to about 14 inches and should be reserved for the most frequently used equipment. Locate the keyboard, mouse, documents, and document holders within this zone.
- Secondary work zone extends from about 14 to 24 inches and should be reserved for items that are occasionally used.
- Tertiary work zone is where you locate rarely used items such as a calendar, photos, personal, and non-functional items.

Frequently used accessories such as calculators, manuals, staplers, etc., should be kept within the primary work zone, so they can be reached comfortably. If you enter information from hard copies, a document holder may be beneficial. *(figure 9)* If you are on the phone for prolonged periods, use a headset. *(figure 10)* The document holder should be located adjacent to and at the same height and angle as the monitor or be placed directly in front of the panel display.

figure 8



Frequently used accessories such as calculators, manuals, staplers, etc., should be kept within the primary work zone, so they can be reached comfortably.

figure 9

If you enter information from hard copies, a document holder may be beneficial. The document holder should be located adjacent to and at the same height as the display panel or be placed directly in front of the display.

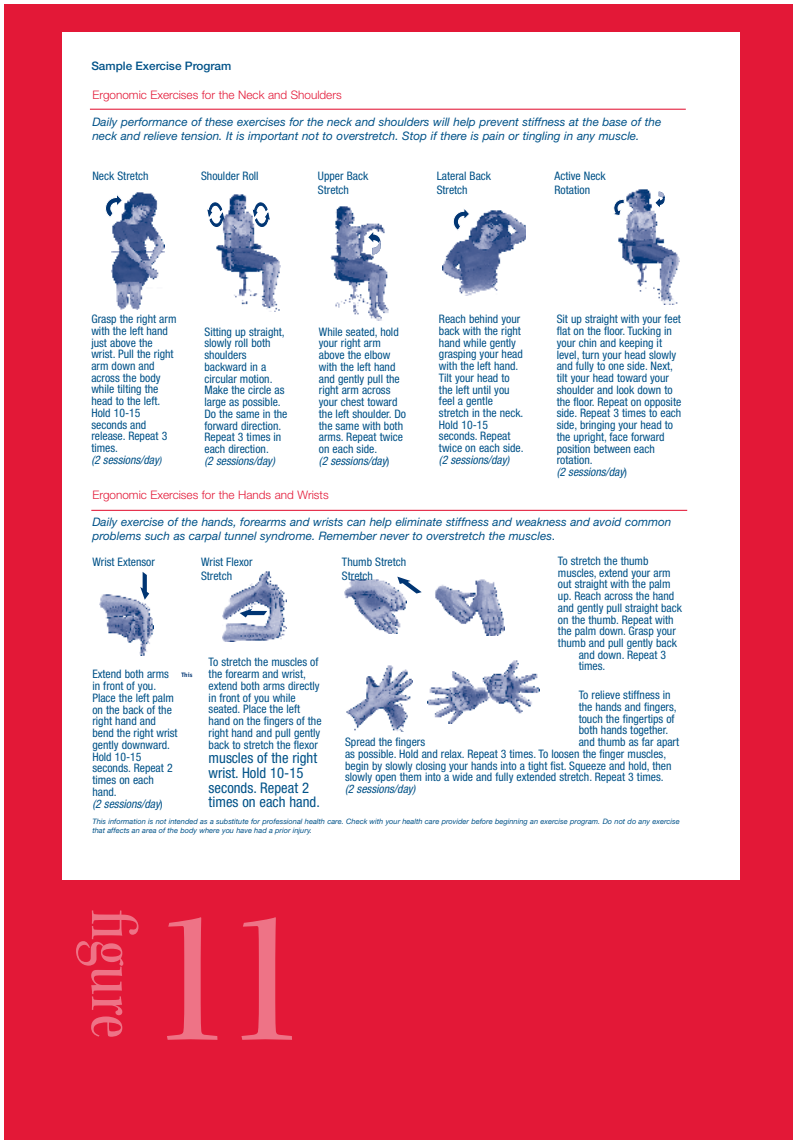
figure 10

If you are on the phone for prolonged periods, use a headset.

Mini Rest Breaks

Wrist rests, if used, are for “resting” when you are not typing. When resting, your heel or palm should contact the pad, not your wrist. When typing, your hands should move freely and be elevated above the wrist rest. If your hands are touching the pad while typing, you may be inhibiting free movement.

Breaks should be taken to control the duration of the tasks you are completing. Microbreaks (less than two minutes) can be taken just by changing the work task and the muscles that are being used. For example, making a telephone call or walking to the printer is a microbreak. Generally, you should take a brief rest break every 30 to 60 minutes. Move around, stretch, or do some other activity. This is particularly important if you have been sitting for two hours or more without a break. *Refer to exercise examples on page 27.*



Sample Exercise Program

Ergonomic Exercises for the Neck and Shoulders

Daily performance of these exercises for the neck and shoulders will help prevent stiffness at the base of the neck and relieve tension. It is important not to overstretch. Stop if there is pain or tingling in any muscle.

Neck Stretch

Grasp the right arm with the left hand just above the wrist. Pull the right arm down and across the body while tilting the head to the left. Hold 10-15 seconds and release. Repeat 3 times. *(2 sessions/day)*

Shoulder Roll

Sitting up straight, slowly roll both shoulders backward in a circular motion. Make the circle as large as possible. Do the same in the forward direction. Repeat 3 times in each direction. *(2 sessions/day)*

Upper Back Stretch

While seated, hold your right arm above the elbow with the left hand and gently pull the right arm across your chest toward the left shoulder. Do the same with both arms. Repeat twice on each side. *(2 sessions/day)*

Lateral Back Stretch

Reach behind your back with the right hand while gently grasping your head with the left hand. Tilt your head to the left until you feel a gentle stretch in the neck. Hold 10-15 seconds. Repeat twice on each side. *(2 sessions/day)*

Active Neck Rotation

Sit up straight with your feet flat on the floor. Tucking in your chin and keeping it level, turn your head slowly and fully to one side. Next, tilt your head toward your shoulder and look down to the floor. Repeat on opposite side. Repeat 3 times to each side, bringing your head to the upright, face forward position between each rotation. *(2 sessions/day)*

Ergonomic Exercises for the Hands and Wrists

Daily exercise of the hands, forearms and wrists can help eliminate stiffness and weakness and avoid common problems such as carpal tunnel syndrome. Remember never to overstretch the muscles.

Wrist Extensor

Extend both arms in front of you. Place the left palm on the back of the right hand and bend the right wrist gently downward. Hold 10-15 seconds. Repeat 2 times on each hand. *(2 sessions/day)*

Wrist Flexor Stretch

To stretch the muscles of the forearm and wrist, extend both arms directly in front of you while seated. Place the left hand on the fingers of the right hand and pull gently back to stretch the flexor muscles of the right wrist. Hold 10-15 seconds. Repeat 2 times on each hand.

Thumb Stretch Stretch

To stretch the thumb muscles, extend your arm out straight with the palm up. Reach across the hand and gently pull straight back on the thumb. Repeat with the palm down. Grasp your thumb and pull gently back and down. Repeat 3 times.

To relieve stiffness in the hands and fingers, touch the fingertips of both hands together. and thumb as far apart Spread the fingers as possible. Hold and relax. Repeat 3 times. To loosen the finger muscles, begin by slowly closing your hands into a tight fist. Squeeze and hold, then slowly open them into a wide and fully extended stretch. Repeat 3 times. *(2 sessions/day)*

This information is not intended as a substitute for professional health care. Check with your health care provider before beginning an exercise program. Do not do any exercise that affects an area of the body where you have had a prior injury.

figure 11

Ergonomic Resources

Provides 10 steps on creating a good ergonomic working arrangement.
http://ergo.human.cornell.edu/

Human Factors and Ergonomics Society – The world's largest scientific association for human factors/ergonomics professionals. Information and resources are available at https://www.hfes.org

U.S. Department of Labor – Describes workstation components; provides tips for appropriate posture.
https://www.osha.gov/SLTC/etools/computerworkstations/

U.S. Department of Industrial Relations – An illustrated ergonomics guide for desktop computer users.
http://www.dir.ca.gov/dosh/dosh_publications/computerErgo.pdf

Conducting Workstation Evaluations

Completing timely workstation evaluations for new employees and employees experiencing discomfort at their workstation is essential to prevent repetitive motion injuries that can be costly and significantly affect productivity. Following the procedures outlined in this section is easy and can be done by a designated trained employee.

When performing a workstation evaluation, it is advisable to use a checklist. *Refer to the checklist on page 25.* Be sure to note any equipment that is needed that has not been provided. To help you focus on correction conditions that may be causing discomfort to the employee, you may refer to the Symptoms and Solutions checklist of this booklet. *Refer to page 26.*

As you begin a workstation evaluation, assess the size and position of the employee relative to the chair, desk, panel display, keyboard, and mouse. Get a sense of what adjustments will need to be made, including the need for a document holder or footrest. Observe the posture of the worker for indications of what needs to be adjusted. Develop information about the type of data entry made during the day, how much data, over what length of time, and what discomfort the employee is experiencing. This will give you some idea of the repetition, duration, and ergonomic exposure.

The goal of performing a workstation evaluation is to make adjustments to equipment so as to achieve neutral body positions that minimize the possibility of discomfort and injury. Making employees aware of the various adjustments that can be made to their workstation equipment will help them achieve maximum comfort throughout the workday.

The order that workstation adjustments are made is very important. Begin making adjustments in the following order:

1. Chair
2. Keyboard tray
3. Panel display
4. Work zone
5. Provide headset, if needed

Adjustment Summary

Here's a summary of the various adjustments that you can make:

The Chair

- Adjust seat height to permit correct adjustments for keyboard entry and panel display viewing.
- Backrest height to fit the "S" curve, just above the buttocks.
- Seat pan tilt slightly forward.
- With the employee's back positioned against the backrest, the front edge of the seat pan should be at least two inches from the back of the leg calf.
- Armrest height and width adjusted so that the worker's shoulders are relaxed when forearms are rested on the armrests.
- Provide a footrest if the chair needs to be raised and the feet are not flat on the floor.

The Keyboard

- Adjust the keyboard height so that the shoulders are relaxed and the angle formed at the elbow is 90 degrees for a "neutral keyboard", or slightly more if the keyboard is set at a negative tilt position.
- Fold the keyboard "legs" up into the keyboard so that the keyboard lays flat.
- Adjust the keyboard tray so as to achieve a slight downward tilt. The goal is to achieve a straight wrist while typing.
- Adjust the keyboard so that the letters B and N on the keyboard line up with the centerline of the torso.

The Panel Display

- Adjust the panel display height so that the top of the viewable screen is set at eye level.
- The display should be set at a minimum distance that is equal to the diagonal of the display. If the employee cannot read the print on the screen, try to adjust the font size of the print on the screen. If this does not resolve the issue, move the display closer to the employee.
- If the dual display panels are used, place the centerline of the primary panel directly in front of the eyes (line up with nose).
- Place the second panel either to the right or the left with the center of this second panel angled such that the center of it is the same distance from the eyes as the first one.

The Mouse

- The mouse should be located immediately to the right or left of the keyboard depending on the dominant hand of the worker. The goal is to have the mouse as close to the body as possible.
- If the numeric keys are seldom used, a mouse platform placed over the numeric keys can be utilized to bring the mouse in closer to the center for a right hand dominant person. This will help reduce ulnar deviation of the wrist.
- The hand should be just above elbow level when resting on the mouse to reduce extension of the wrist.

Telephone and Data Entry

- When work activities require the use of a telephone while entering computer data or note-taking, using a headset will prevent the worker from "cradling" the handset between the head and shoulder. This will help prevent neck and shoulder injuries. *(figure 12)*

The Work Zone

- Primary work zone extends to about 14 inches and should be reserved for the most frequently used equipment. Locate the keyboard, mouse, documents, and document holders within this zone.
- Secondary work zone extends from about 14 to 24 inches and should be reserved for items that are occasionally used.
- Tertiary work zone is where you locate rarely used items such as a calendar, photos, personal, and non-functional items.

figure 12

When work activities require the use of a telephone while entering computer data or note-taking, using a headset will prevent the worker from "cradling" the handset between the head and shoulder. This will help prevent neck and shoulder injuries.

How to Reach Republic Indemnity

If you have any questions please call our toll-free number at 800-821-4520 (select Option 8) or send an email to RICALC@ri-net.com.

RepublicIndemnity.com

Workstation Evaluation Checklist

Employee _____ Job Description _____

Total daily computer work done at work or at home _____ Total personal computer use at home _____

Evaluator _____ Other _____

Note: If an item is needed but not shown here, please list under "Other"

SCREEN PANEL	YES	NO
Is it located directly in front of keyboard and operator (18"-24")?	☐	☐
Is its height, tilt, and rotation adjustable?	☐	☐
Is the top of the viewable screen at eye level?	☐	☐
Is the text or graphics on screen easily read or viewed?	☐	☐
Is the screen free of visible flickering?	☐	☐
Is it positioned away from direct or reflected glare?	☐	☐
Is an anti-glare screen or shade provided?	☐	☐

DOCUMENT HOLDER	YES	NO
Is a document holder provided?	☐	☐
Is it positioned at screen level?	☐	☐
Is it the same distance from the eyes as the panel display is?	☐	☐
Is there adequate lighting on the document?	☐	☐

KEYBOARD HOLDER	YES	NO
Is a keyboard holder provided?	☐	☐
Is the height adjustable?	☐	☐
Is the tilt adjustable to +/- 15 degrees?	☐	☐
Is it positioned directly in front of the display and operator?	☐	☐
Is it wide enough to hold both keyboard and mouse/trackball?	☐	☐
Are the keyboard "legs" flat?	☐	☐
Is a wrist rest provided for resting the palms when not entering data?	☐	☐

MOUSE	YES	NO
Is a mouse or track ball provided?	☐	☐
Is the mouse or track ball level with and adjacent to the keyboard?	☐	☐
Does the mouse fit comfortably in the hand?	☐	☐
Does the cursor respond smoothly to mouse movements and clicks?	☐	☐

FOOTREST	YES	NO
Is a footrest provided?	☐	☐
Is the height and angle adjustable?	☐	☐

* Other _____

_____

_____

CHAIR	YES	NO
Is the chair positioned in front of the display and keyboard?	☐	☐
Can the chair height be easily adjusted from a seating position?	☐	☐
Is it 25% wider than the occupant?	☐	☐
Is the backrest height & angle adjusted for mid and lower back support?	☐	☐
Are the armrests adjustable (height and width) or removable?	☐	☐
Is the seat pan angle and tilt adjustable?	☐	☐
Is the seat pan padded with a gently sloped front edge?	☐	☐
With the employee's back against the backrest, does the seat pan end at least two inches behind the leg calf?	☐	☐
Is seat pan's upholstery porous, breathable, and non-slip?	☐	☐
Is the base stable (5-leg pedestal on casters)?	☐	☐

POSTURE	YES	NO
Is the head maintained in near upright position so that the neck bends no more than 20 degrees backward?	☐	☐
Is the individual seated back against the backrest, facing the keyboard and panel display?	☐	☐
Are wrists maintained in neutral (not bent) position?	☐	☐
Are wrists kept floating while typing (not fixed on surface or wrist rest)?	☐	☐
Are elbows kept close to the body?	☐	☐
Are elbows maintained at 90-110 degree angle?	☐	☐
Is lumbar support provided for the natural "S" curve of the back?	☐	☐
Are shoulders down and relaxed?	☐	☐
Are thighs comfortably under the keyboard at a 120-130 degree angle to the trunk?	☐	☐
Are knees maintained at a 90-110 degree angle?	☐	☐
Are feet resting flat on the floor or on a footrest?	☐	☐

MISCELLANEOUS	YES	NO
Are frequently used items positioned within arm's length and easy reach?	☐	☐
Are headsets provided if regular phone work is required?	☐	☐
Is there sufficient and even lighting?	☐	☐
Are frequent short breaks taken to rest the eyes?	☐	☐
- 15 minutes for every two hours of moderate work	☐	☐
- 15 minutes for every hour of heavy continuous work	☐	☐

Symptoms / Solutions

	CAUSE PRESENT?			
SYMPTOM	**YES**	**NO**	**POSSIBLE CAUSE**	**POSSIBLE SOLUTIONS**
Frequent headaches, eye strain	☐	☐	Inappropriate screen colors	• Adjust screen distance from operator so print is easily recognizable • Change screen color selections • Anti-glare screen • Conduct lighting survey • Illumination on VDT and document holder should be checked • Move document holder to same distance as display • Rest eyes by focusing on object 20 feet or more away at least once an hour for 5-10 minutes (i.e., perform non-computer tasks, or take a break) • Eye glasses
	☐	☐	Too much, or too little lighting	
	☐	☐	Glare on screen	
	☐	☐	Screen too far away	
	☐	☐	Document holder and panel display at different distances from user	
	☐	☐	Worker vision problem	
Pain on one side of neck/shoulder	☐	☐	Panel display to the side of operator	• Position screen, keyboard, and user in a straight line • Place mouse adjacent to keyboard • Provide headset if phone must be used to enter data • Place telephone on non-dominant hand side • Raise chair height • Adjust lumbar chair support to fit in the small of the back
	☐	☐	Telephone cradled between head and shoulder	
	☐	☐	Mouse too far away	
Neck and shoulder pain	☐	☐	Display too low, or too high	• Adjust display height • Adjust distance to screen • Lower keyboard • Place mouse adjacent to keyboard • Move chair closer to keyboard • Raise chair height • Adjust lumbar chair support to fit in the small of the back • Keep materials within a 14" to 16" reach • Keep materials below shoulder level • Provide headset if phone must be used to enter data • Do not lean forearms on desk
	☐	☐	Display too far away	
	☐	☐	Keyboard too high	
	☐	☐	Keyboard too far away	
	☐	☐	Mouse too far away	
	☐	☐	Materials too far away or too high	
	☐	☐	Lower back not supported	
Pain in fingertips	☐	☐	Hitting keys too hard	• Lighter key stroking • Track ball or alternative mouse
	☐	☐	Clicking mouse too forcibly	
Lower back pain	☐	☐	Lack of chair support for lower back	• Adjust backrest to fit lumbar curve of the lower back • Seat pan should allow the individual to sit back in the seat against the backrest • Adjust seat height so thighs are parallel to the floor and knees at 90-110 degree angle • Seat pan and backrest tilt should be adjusted • Feet should rest on the floor or on a footrest
Numbness in lower legs	☐	☐	Seat pan too short causing direct pressure to underside of thighs	• Adjust height of chair to keep thighs parallel to the floor, and knees at 90-110 degree angle • Seat pan should allow two to three inches clearance between calf of the leg and forward edge of seat pan • Provide seat pan with waterfall front edge • Provide footrest
	☐	☐	Seat pan too long causing direct pressure to underside of knee joints	
	☐	☐	Feet not resting on floor	
Numbness in fingers; pain in wrists	☐	☐	Wrist resting on sharp edge	• Maintain wrists in a straight or neutral position • Lower keyboard or chair to maintain straight and neutral wrist position • Adjust keyboard to tilt downward away from you • Float hands when typing • Avoid resting wrists on wristrest while typing • Provide wristrest/palm rest • Keep elbows in close to the body • Keep mouse and other materials in front of you rather than to the side • Try alternative mouse or track ball • Adjust keyboard so forearms are sloping slightly downward, and wrists are straight when typing • Avoid using armrests while typing or using the phone
	☐	☐	Wrist bent up or down or sideways most of the time	
	☐	☐	Gripping mouse too forcefully	
	☐	☐	Resting elbows on armrests	
Pain along outside or inside of the wrist	☐	☐	Deviating from neutral position while hitting certain keys or moving mouse	• Move hand rather than deviate wrist

Sample Exercise Program

Employees may want to post this diagram by their workstations.

Ergonomic Exercises for the Neck and Shoulders

Daily performance of these exercises for the neck and shoulders will help prevent stiffness at the base of the neck and relieve tension. It is important not to overstretch. Stop if there is pain or tingling in any muscle.

Neck Stretch

Grasp the right arm with the left hand just above the wrist. Pull the right arm down and across the body while tilting the head to the left. Hold 10-15 seconds and release. Repeat 3 times.
(2 sessions/day)

Shoulder Roll

Sitting up straight, slowly roll both shoulders backward in a circular motion. Make the circle as large as possible. Do the same in the forward direction. Repeat 3 times in each direction.
(2 sessions/day)

Upper Back Stretch

While seated, hold your right arm above the elbow with the left hand and gently pull the right arm across your chest toward the left shoulder. Do the same with both arms. Repeat twice on each side.
(2 sessions/day)

Lateral Back Stretch

Reach behind your back with the right hand while gently grasping your head with the left hand. Tilt your head to the left until you feel a gentle stretch in the neck. Hold 10-15 seconds. Repeat twice on each side.
(2 sessions/day)

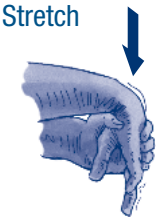
Active Neck Rotation

Sit up straight with your feet flat on the floor. Tucking in your chin and keeping it level, turn your head slowly and fully to one side. Next, tilt your head toward your shoulder and look down to the floor. Repeat on opposite side. Repeat 3 times to each side, bringing your head to the upright, face forward position between each rotation.
(2 sessions/day)

Ergonomic Exercises for the Hands and Wrists

Daily exercise of the hands, forearms and wrists can help eliminate stiffness and weakness and avoid common problems such as carpal tunnel syndrome. Remember never to overstretch the muscles.

Wrist Extensor Stretch

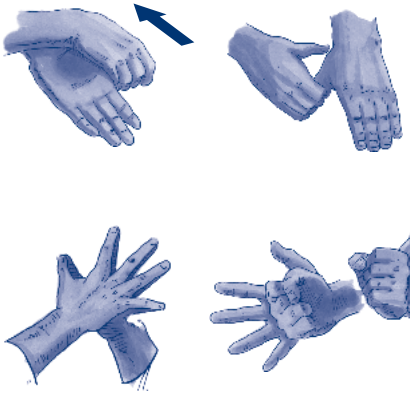


Extend both arms in front of you. Place the left palm on the back of the right hand and bend the right wrist gently downward. Hold 10-15 seconds. Repeat 2 times on each hand.
(2 sessions/day)

Wrist Flexor Stretch

To stretch the muscles of the forearm and wrist, extend both arms directly in front of you while seated. Place the left hand on the fingers of the right hand and pull gently back to stretch the flexor muscles of the right wrist. Hold 10-15 seconds. Repeat 2 times on each hand.
(2 sessions/day)

Thumb Stretch



To stretch the thumb muscles, extend your arm out straight with the palm up. Reach across the hand and gently pull straight back on the thumb. Repeat with the palm down. Grasp your thumb and pull gently back and down. Repeat 3 times.
(2 sessions/day)

To relieve stiffness in the hands and fingers, touch the fingertips of both hands together. Spread the fingers and thumb as far apart as possible. Hold and relax. Repeat 3 times. To loosen the finger muscles, begin by slowly closing your hands into a tight fist. Squeeze and hold, then slowly open them into a wide and fully extended stretch. Repeat 3 times.
(2 sessions/day)

This information is not intended as a substitute for professional health care. Check with your health care provider before beginning an exercise program. Do not do any exercise that affects an area of the body where you have had a prior injury.

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