

# Office Ergonomics

A Guide to Creating a Safe Office Environment

**MEMIC**  
Partners for Workplace Safety™

## **Office Ergonomics: A Guide to Creating a Safe Office Environment**

# **MEMIC**

**COPYRIGHT 1995 MEMIC**

This information is protected under U.S. copyright laws as an unpublished work, and is confidential and proprietary to Maine Employers' Mutual Insurance Company. You are not to duplicate or copy this document in whole or in part without the express written permission of the Loss Control Department of Maine Employers' Mutual Insurance Company. You are not to disclose, display or distribute the information in whole or in part to any member of the public or to any third party without permission. Maine Employers' Mutual reserves all other rights.

# Table Of Contents

I.	Introduction	4
II.	Defining Key Words	6
III.	Personal Risk Factors	7
IV.	The Body	10
V.	The Workstation	12
VI.	The Chair Challenge	15
VII.	Stretches	16
VIII.	Communicating Ergonomics	17

# MEMIC I. Introduction

Your in-box is already halfway to the ceiling and the deadlines were yesterday. You feel like you're at least three days behind and now your boss brings you this, a book on ergonomics. Great. Just what you've always wanted.

But if you work in an office with a computer, keypunch or telephone, this book just might save you time, not to mention considerable discomfort. Injuries caused by repeating the same motions again and again, or by holding your body in an unnatural position for long periods of time are the leading cause of injury to office workers. What can begin as a small discomfort is not as benign as it might seem. The solution is before you now. "Doing Ergonomics" is the answer.

Ergonomics is a trendy word to describe the study of people in working environments. Not only can poor ergonomics result in small, end-of-the day pain and stiffness, it can lead to serious trauma and sometimes to a crippling injury. In 1994, nearly 50 percent of all injuries that resulted in a worker losing time from work in banking, real estate and insurance was attributed to injuries caused by repetitive motion under poor ergonomic conditions. But these injuries can be prevented. In fact, solving what could turn into a debilitating back injury could be solved by something as simple as a brick or a telephone book. This manual will help you and your co-workers to do just that.



•••  
By forming an ergonomics team, businesses will benefit with lower injury rates.  
•••

# Introduction (cont.)

To really *do ergonomics*, it takes a team approach. Co-workers and managers alike must work to develop methods to make work comfortable. We advocate an ergonomics team to identify problems and solve them before someone gets hurt.

Poor ergonomics hurts the worker who suffers the pain and loss of physical ability. And it hurts the manager who must go on without a key employee while paying higher workers' compensation rates, not to mention the cost of hiring and training a replacement. Doing ergonomics. It just makes sense.



•••  
Improper use of office  
equipment can be  
detrimental to the  
health and well being  
of your body.

•••

## Stretch Break

### IMPORTANT!

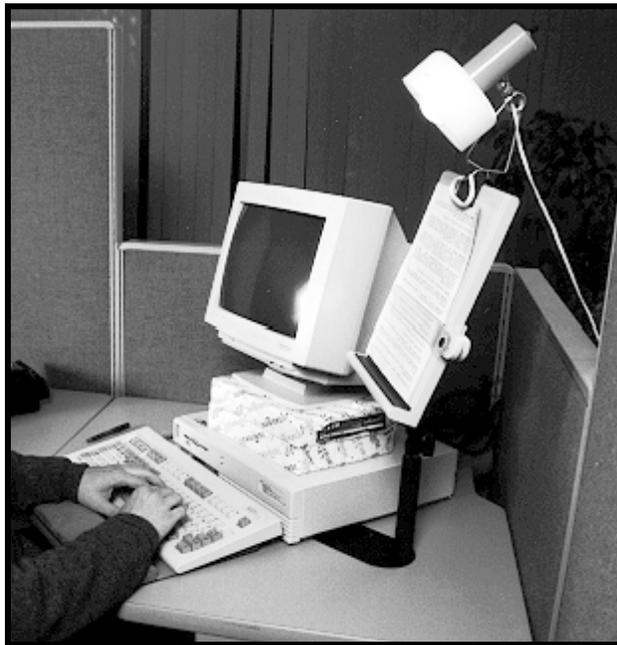
Stretching allows oxygen rich blood to reach muscles and other soft tissues that often is starved while sitting or repeating the same motion.

As you read this guide you will notice stretching examples in the sidebar. The "Stretch Break" sidebar will explain how the stretches are to be properly executed during your group or personal stretching routine.

Never strain or pull during a stretch—ease in and out slowly.

**O**ne of the first things in any effort to inform is to define. Ergonomics might be a new-sounding word, but it doesn't need to be confusing. Here are some terms that you will need to know before we start.

**VDT or Video Display Terminal:** includes any computer hardware such as the keyboard, the monitor, the disk drive, a document holder, wrist rest and printer.



•••  
Ergonomic changes do not have to be expensive. Using reams of paper to raise a monitor is an inexpensive way to correct a potential problem.  
•••

**Ergonomics:** The study of the person and their physical environment.

**Cumulative Trauma:** A “wear-and-tear” injury caused by a combination of problems in the working environment. This may develop over a period of time. When sustained on a regular basis without recovery, the injury can be painful and debilitating.

**Cumulative Trauma Disorder (CTD):** Term used for about 25 different conditions/injuries which include repetitive strain or motion injuries, soft tissue injuries, biomechanical stress, and occupational overuse syndrome. CTDs account for half of the injuries that result in workers' compensation claims.

# III. Personal Risk Factors

## What is Risk?

**D**espite what Parker Bros. tells you, “risk” is much more than a board game. In fact, ergonomic risks surround you at your work and at home. But you can minimize your risk, by first being able to identify your personal risk factors. Here are a few:

- The **Repetition rate** is the number of times the same movement is repeated during essential tasks.
- **Duration of Exposure** is the length of time spent in repeating those same motions.
- **Recovery Time** is the amount of time necessary to recover from the effects of repetitive motion or other risk factors.



•••  
A person's working environment can cause stress.  
•••

- **Noise**, especially excessive or distracting noise, can contribute to stress in the workplace. Use of telephones and electronic dictation devices requires a quiet environment.

## Stretch Break



### Shoulder Stretch:

Put your hands behind your back and interlock your fingers. Slowly lift your arms behind you until you feel a stretch in your arms, shoulders, or chest. Hold this or 10 seconds. Relax. Repeat two times.

- **Posture** is the position of the back, neck, shoulder, elbow, or wrist that deviates from the position your body was made to take. (Awkward postures interact with other risk factors and make potential problems worse.)
- **Vibration** if found in office environments, can cause cumulative trauma disorders.
- **Temperature** extremes can affect natural body responses which can result in injuries.
- **Lighting**, the lack of it, or glare from fluorescent lights can cause eyestrain, awkward neck postures and impede productivity.
- **Physical contact** with any part of the work area can cause discomfort.
- **Height and distance** can be the culprit in injuries that are caused by desk chairs that are too low or too high for the workstation operator. Further problems can occur if a person has to constantly reach or bend.
- **Air** can cause problems if it is of poor quality. If air circulation is not efficient and windows cannot be opened, there is an increasing potential for headaches, asthma attack and other illnesses.

# Personal Risk Factors (cont.)

There are other personal risk factors as well:

- Smoking
- Asthma
- Diabetes
- Drug/alcohol abuse
- Physical disabilities
- Past history of illness or injury
- Hormone changes
- Heart conditions
- Thyroid conditions

Remember you are personally responsible for identifying and, in most cases, modifying your personal risk factors.



•••  
Respiratory ailments such as asthma, a chronic respiratory condition, or smoking are personal risk factors.

•••

## Stretch Break



## Active Wrist Exercise:

Support your right forearm with your left hand. Bend your wrist back (extend) and then bend it in the opposite direction (flex). Do this four times each direction. Bend for one second. On the last bend in an extended position, hold for 15 seconds. Change positions so that you are supporting your left forearm. Repeat same exercise.

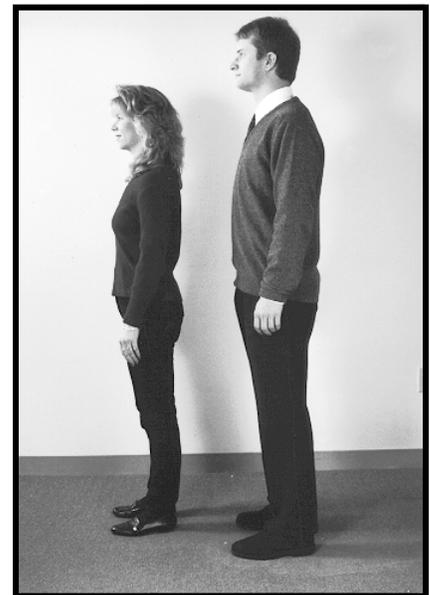
# MEMIC IV. The Body

## Neutral Postures: If your body had its choice...

**W**ould you drive your sportscar like it was a pickup truck? Not if you value your car, you wouldn't. So why would you try to make your body do things that it wasn't built to do? Just like a sportscar, your body was engineered for certain positions. These are called neutral postures. A neutral posture depends on the natural alignment of the body. Your back has three natural curves: the cervical, the thoracic and the lumbar curves. These curves are correctly aligned when



•••  
The body is in a neutral posture when the ears, shoulders, hips are all in alignment.  
•••



the ears, shoulders and hips are in a straight line. These postures depend on strong muscles in the hips, thighs and abdomen. This sort of alignment assures that your body's weight is distributed evenly, placing no stress on any particular area. If your body had its choice, it would choose the balance of a neutral posture. Remember these important points about body posture:

- Neutral postures reduce stress and fatigue on body parts.
- Muscles are strongest when working from neutral postures. After all, your body was built to work from these positions.
- There are many neutral positions and every person should find two or three which are comfortable for them in their working environment.
- Static postures reduce blood supply to the body parts causing waste products to build up and forcing the muscles to work without proper nutrients.
- Without proper replenishment, your muscles are less strong and less able to perform their tasks. And that can lead to other injuries.

# IV. The Body (cont.)

## Back Off on Poor Posture

**Y**our back is your foundation and it takes the brunt of bad posture. Yet despite its position as the body's stabilizer, it is a delicately-built structure. The back is made up of small vertebrae which allow you to bend your back in many positions. Between each of the vertebrae are soft discs that act as shock absorbers. Abusive movements and static postures can weaken these vital discs. Your back would appreciate it if you would:

- Avoid prolonged sitting. Staying in a sitting position for more than 45 minutes is one of the worst postures for the back.
- Avoid reaching and twisting while sitting. This can contribute to weakening discs.
- Avoid holding objects away from your body. Holding a heavy object such as a box away from your foundation while sitting or standing increases the risk of damaging your back.



...  
Poor posture can  
lead to numerous  
types of debilitating  
back, shoulder, and  
hip conditions.  
...

## Stretch Break



### Head Tilts:

Tilt your head to one side as if touching your ear to your shoulder. Don't raise your shoulder to meet your ear. Hold for 3 seconds. Return to middle, briefly, tilt head to other side in the same manner. Hold for 3 seconds. Repeat four times. On the last set, hold for 15 seconds each time.

## Your body can't change but what about your environment?

If it was possible, you'd probably just change your body so that it would do the things that would make work easier for you. Biology tells us that animals (humans included) adapt over time. Of course, biology also tells us that those changes take thousands, even millions, of years. Instead of waiting through a millennium (when you'd almost certainly have reached some sort of mandatory retirement age), why not change your workstation to make it more friendly to your body?

Most office workstations have the same basic components. There's the desk, the chair, the keyboard, the telephone, the shelving, the computer monitor and any other pieces of equipment. In assessing your workstation, everything must be questioned. Pretend as though you are inventing your space. Ask yourself questions such as these:

- **The work area:**

- Is there leg and knee room under the desk?
- Is standing required to reach files or manuals?
- Is there good lighting, without glare?
- Is the temperature comfortable?
- Is the area quiet?

- **The work surface:**

- Is the desktop glossy?
- Is there adequate working space?
- Are commonly used items positioned to minimize reach?
- Does the depth of the work surface support the equipment?
- Is the height of the work surface positioned for the operator?

- **The keyboard:**

- Is the keyboard in front of the operator?
- Is the keyboard in line with the monitor?
- Is the keyboard tray used?
- Is the keyboard tray adjustable in two locations?
- Is there a forearm support used?
- Is the forearm support positioned one or more inches from the keyboard tray so that the fleshy part of the palm falls into the space created between the keyboard and the forearm support?
- Are there a variety of forearm supports available?

# V. The Workstation (cont.)

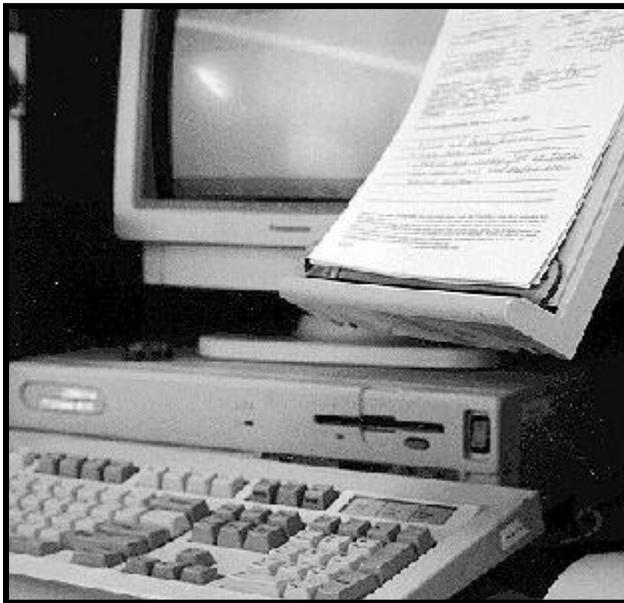
- **The monitor:**

Is the monitor in front of the operator?

Is the top line of text on the screen at eye level?

Is the screen free of dust and glare?

Are the color of the text and background colors able to be changed?



•••  
For proper ergonomic fit, place your monitor so the top line of text on the screen is at eye level.

- **The document holder:**

Is the copy holder at the same height as the screen?

Are holders of varying size available?

Does the operator alternate the side of the monitor on which the holder is placed?

Does the type of work require the copy holder to be directly in front with the monitor off to the side?

## Stretch Break



### Head Turns:

Turn your head so that you look over your right shoulder.

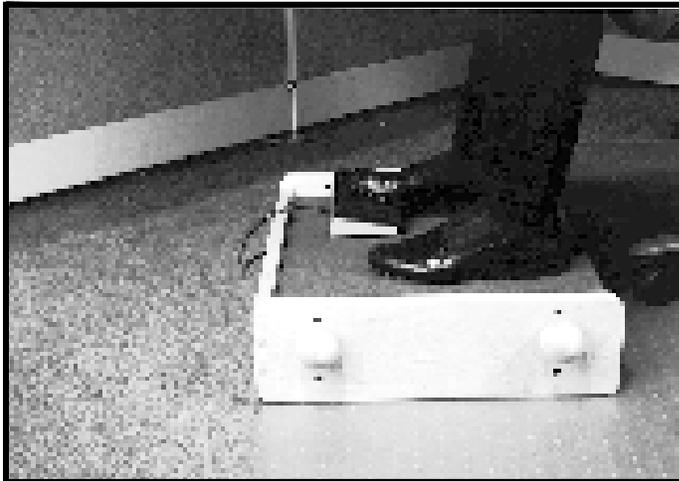
Hold for 3 seconds.

Slowly turn your head and look over your left shoulder.

Repeat four times.

On the last set, hold for 15 seconds on each side.

# MEMIC V. The Workstation (cont.)



•••  
A footrest can add the needed support to reduce fatigue in the feet and legs.

•••

- **The footrest:**

Is a footrest needed?

Does the footrest provide the needed support?

Does the footrest allow for use of a foot pedal if it is required?

- **Reaches:**

Is excessive overhead reaching required to get to materials or resources?

Are frequently-used items within reach simply by bending at the elbow?

- **Phones use:**

Is employee required to use phone and take notes, making a headset necessary?

Is the telephone placed in such a way as to eliminate cross-body?



••• Telephones should be placed on the non-dominant side of the body to eliminate cross-body reaches.

•••

# VI. The Chair Challenge

The chair is perhaps the most vital piece of the workstation. It becomes the body's foundation for office workers. It must be strong, comfortable and versatile. Following is a rigorous test for your chair. Can it meet the chair challenge?

- Is the seat pan adjustable to accommodate people of various heights?
- Is the tilt of the seat pan adjustable so that it slopes slightly forward, to avoid pinching and to improve blood flow to the legs?
- Are the backrest's height, horizontal and vertical positions adjustable to fit?
- Are arm rests adjustable? (If not, then chairs without arm rests are desirable.)



...  
Chairs have multiple adjustments allowing for a person to customize an important part of their environment.  
...

## Other Chair Considerations

- The chair should have five legs for stability.
- Chair casters (vinyl vs. carpet) should be self-locking and swivel 360 degrees.
- Adjustment controls should be sturdy and be operable while seated.
- Fabric should be permeable to allow breathing.
- Employees should be trained in the adjustments that can be made to their chairs.
- Maintenance should be available for the chair.

## Stretch Break



### Finger Stretches:

Arms are relaxed and hanging by your side. Slowly alternate making a full fist and then an outstretched hand (fingers extended and spread apart).

Repeat this open and close motion ten times.

## **The two-minute workout and the 7th inning stretch**

**N**o matter how wonderfully your workstation is assembled, your body will still need a little time to adjust to the work it's about to do. Just as athletes warm-up before their games, so too must office workers prepare for their workdays. By stretching your muscles- particularly the ones you'll use most in a day's work- you will give your body a chance to shake out the cobwebs, get your blood flowing and be ready to work.

### **Stretching will:**

- warm muscles and connective tissue helping to prepare the body for activity.
- supply muscles with fresh, oxygenated blood.
- remove waste products that build up in muscle tissue.
- improve employee morale by showing that their health is important.
- improve flexibility and mobility.

These stretches are best if the office breaks formally and does them at least two times a day. Stretch breaks should include everyone from the president to the part-time employees. These are the workday's "seventh-inning stretches." (and, if you like, you can even sing "Take Me Out To The Ballgame.") Make this a fun activity. Appoint stretch break leaders and rotate often. It is important to make stretching an integral part of each person's job. A tone or bell used over an intercom system at 10:00 am and 2:00 pm will remind everyone, it is time to stretch.

**Maine Employers' Mutual has published pamphlets with stretches that can be used by companies to get started. Please call 1-800-773-7900 to receive additional information about stretch programs.**

# VIII. Communicating Ergonomics

Now that you've been introduced to the concepts and equipment available for an ergonomically adjustable office, the next step is to form an "Ergonomic Team." The team should include people from throughout the organization, at all levels and from every task group. Ergonomic team members will help to determine how to make the workplace a better place for their co-workers. Whether it be through constructive discussions with fellow workers or by observing (and helping to rectify) a problem with a work area, team members will help to make sure there is a company-wide commitment to making work more safe.

Here are some suggestions about training your ergonomic team.

- Stress the common goal: safety for everyone!
- Emphasize the importance of thorough education.
- Cooperation between management and employees is key.

Once the ergonomics team has developed a plan for the office, each employee should receive a written copy of the team's goals. The plan should also include training schedules, copies of the office stretch routine and a checklist for each employee to follow when evaluating their own workstation.

## **E d u c a t e   I m p l e m e n t   C o m m u n i c a t e**

Once the plans are in place and working, keep communicating. Use the company newsletter, paycheck stuffers and bulletin boards to inform everyone that changes are being made and that the ergonomics plan is a success.

Monitor the plan and evaluate it regularly. Make sure the employees have a stake in it and believe in the plan. Everyone should participate (and not just during the first few weeks, either).

No matter how simple "Doing Ergonomics" seems, it does require change and that is never easy. That's why it only makes sense to begin by educating your co-workers. Unless they are well-informed, they may not find out how to prevent an injury until it's too late.

It takes just a little change for a lot of benefit. The rewards are many when the workplace is safe for everyone.

## Stretch Break



### **"Pseudo-Walk":**

During the first six exercises, walk in place at a slow pace. Alternate lifting your heels off the ground without taking the front of your feet off the ground.

# Video Display Training Employee Document

I, \_\_\_\_\_, as an employee of \_\_\_\_\_  
have received Video Display Terminal (VDT) Training by \_\_\_\_\_.

I have been instructed in the following:

-  Proper monitor location and eyesight factors;
-  Preferred wrist position at the keyboard;
-  Chair adjustability and proper posture;
-  Lighting and glare considerations
-  Stretching Exercises
-  Other

Signed: \_\_\_\_\_

Date: \_\_\_\_\_

# Sample Incident/ Complaint-Of-Pain Report

(For internal use only.)

(Note: Employee and supervisor should fill out this form together.)

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Department: \_\_\_\_\_

Date of hire: \_\_\_\_\_ Date of first symptom/injury: \_\_\_\_\_

Nature of injury/discomfort: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Time in current position: \_\_\_\_\_

Any changes in nature of your work in the last four weeks? \_\_\_\_\_  
\_\_\_\_\_

Overtime worked in the last four weeks? \_\_\_\_\_  
\_\_\_\_\_

Cause of injury/discomfort? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Treatment of first aid applied: \_\_\_\_\_  
\_\_\_\_\_

Corrective action to be taken: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Signed \_\_\_\_\_  
Supervisor

\_\_\_\_\_  
Employee

\_\_\_\_\_  
**Employee Name**

\_\_\_\_\_  
**Evaluator**

\_\_\_\_\_  
**Date**

<b>DESCRIPTION OF WORKSTATION ELEMENTS</b>	<b>YES</b>	<b>NO</b>	<b>ACTION</b>
Arms form a 90 degree angle at the elbow with fingers on the home row of keys with forearm support.			
Monitor or hard copy in front of operator (18" - 26" from operator).			
Monitor at proper height for operator.			
Document holder being used (positioned at the same height as the monitor).			
Operator knows how to adjust chair - height, seat pan, arms (if apply), swivel, wheels.			
Lumbar support adequate - Adjustable in two directions (up and down, in and out).			
Seat width and depth supports the operator - upholstered.			
Two inches between back of knees and chair.			
Slope of seat supports operator with hips slightly above knees.			
Clearance for legs underneath desk.			
Glare from natural and unnatural light controlled - No natural light in the operator's eyes on the screen.			
Contrast on monitor adjusted and color changes made as available.			
Adequate workspace - storage of frequently used items does not require reaches overhead or behind when seated.			
Footrest needed/used.			
Phone use extensive with headset, if appropriate.			
Calculator positioned for neutral wrist and 90 degrees at elbow with wrist rests.			
Are stretches done daily?			
Eye exam - last date?			
Last date of VDT training.			



**MEMIC**

Partners for Workplace Safety™  
Maine Employers' Mutual Ins. Co.

PO Box 11409

Portland, ME 04104

Telephone: 1-800-660-1306

Fax: 207-791-3333

[www.memic.com](http://www.memic.com)