Ergonomics is the scientific study of work, and also of the relationship between workers and the equipment they use. Ergonomics is important because each worker must have tools that fit so that injuries will not occur.

The work must be adjusted to the worker, not the worker to the work. This adjustment will help ensure a safe and healthy crew and avoid worker’s compensation claims.

Work encompasses a wide range of places both on and off the job. The portion on which we wish to focus is while you are at work. On the job ergonomics includes parts of manufacturing, warehouse, transport, and office environments.

Office ergonomic areas of concern are work stations or desks which have video display terminals (VDTs). Examples would be computers or word processors. Another area of concern is the telephone call center.

When the same task is repeated over and over, portions of the body are held in awkward positions, undue strain is placed on muscles, or other unadvisable conditions such as glare, poor temperature control, or excessive vibration are present, then repetitive or cumulative trauma-related injuries can occur.

Lifting a load and the way in which materials are handled can also cause concern. Injuries can occur when a worker overreaches, lifts incorrectly, or improperly uses the lifting aids which are provided. (See “Back Safety, Sprains, and Strains”)

HOW TO IDENTIFY POSSIBLE ERGONOMIC ISSUES

If ergonomic strains are allowed to continue, injuries will be incurred to the tune of thousands of dollars per claim. Cumulative Trauma Disorder (CTD), strain of the lower back, and strain of the shoulders are typical ergonomic stress claims. Evaluations should identify the frequency and severity of exposure to cumulative or repetitive trauma. Here are several evaluators to aid you in identifying possible areas of concern:
EVALUATORS

Be aware that any unnecessary bending, twisting, or other full-body extensions may make risk factors such as repetition, awkward posture, position, and force increase. Disorders of the back are particularly susceptible to these movements.

• Failure to maintain the alignment of the head and neck can contribute to a troublesome work environment.

• Overreaching or other unusual extensions can cause back or shoulder cumulative or repetitive traumas.

• Unnecessary elbow stress can cause strained upper body muscles.

• When wrists are unnecessarily or repetitively bent, increased strain and pressure are placed on the joints, tendons, nerves, and blood vessels that travel through the sheathed carpal tunnel found in the wrist. Muscles, tendons, and nerves may become damaged, resulting in numb fingers and ever-increasing difficulty performing precise work.

• Another concern is when employees must squat or kneel frequently. If this is happening, it means that employees are exposed to poor ergonomics and the concerns previously mentioned are raised.

• If the feet or back are not properly supported, seating can become uncomfortable and cause strain in the lower back.

If you are designing or renovating a work space, consider these evaluators. Although each design is dependent upon the nature of the work being performed as well as the physical characteristics and capacities of the employee, the end goal of the design should be to reduce ergonomic strain.

WORK STATION DESIGN

When you design a work station, notice the diagram at the above right. There are some pertinent points to consider:

• Worker posture should be properly maintained while tasks are being performed.

• A 90 degree angle should be maintained between the back and upper legs, upper and lower legs, and upper and lower arms.

• The worker head should be up and level.

• Feet should be flat or on a foot rest, not dangling.

Pertinent points may be accomplished by use of the following:

CHAIR should have

• Adjustable seat height

• Five legs for stability

• Flooring-appropriate casters

• An easily swiveling seat

• Firm, supportive back rest with angle and height adjustment

• Padded for comfort but ventilated to prevent heat accumulation

• If arm rests are included, they should not hamper arm movement

KEYBOARD

• Keyboard stand height should be adjustable to be level with the elbow

• Keyboard should need only slight to moderate pressure on the keys while typing

• Angle of the surface should be adjustable

• When properly placed, is flat or angled only slightly upward

• Slightly concave keys will better form to fingers

MONITOR

• Needs a swivel base

• Screen top should be no higher than eye level and not more than 15 degrees below eye level

• Should have anti-glare screen which is kept clean

• Should not be positioned in front of a bright light source

• Should be placed about 18-24 inches from the worker’s face

• Should have a tilt screen

COPYHOLDER

• Distance and height are the same as for the monitor screen
OFFICE ERGONOMICS

TABLE/DESK
- Should be adjustable
- Should allow ample leg room
- Should be roomy enough for the worker’s needs
- Should have “immediate access zone” for the mouse
- Should have ample space for knees (at least 30” wide x 19” deep x 27” high)
- Should not fill spaces with furniture, boxes, or drawers
- Construction should be durable
- Work surface should not be dark colored to avoid too much contrast
- Avoid bright lights within the worker’s field of vision
- Lighting should be steady
- If additional lighting is needed, consider task lighting

- Noise level should not be distracting
- Keep the work space clean and dust levels low
- The work area should have ample air circulation
- Workspace temperature and humidity should be relatively comfortable at 68-72 degrees Fahrenheit and 30-50% humidity
- See Office Ergonomics (Part II) Environmental Factors if you need more information.

OFFICE ERGONOMICS PART 2
One of the best ways to avoid repetitive stress injuries is to change the movement frequently. Office work environments should be able to accommodate light stretching or exercises that will avoid or keep strains to a minimum.

Workers should shift positions frequently, remember to blink while working at a monitor screen, and vary work routines so that they can maintain their best health.

Never do any exercises which cause pain, are uncomfortable, are not within your physical constraints, or are in opposition to the orders of your doctor. A few exercises which may help employees prevent strain are outlined here.

EYE STRAIN
- At regular intervals, change your focus. If possible, focus on something at least 20 feet away from you for half a minute or so.
- Rotate your eyes around. Look toward the ceiling, then down to the floor, then to each side.
- Periodically focus on the edge of the ceiling and follow the line.
- Close your eyes for a second or two so they will be properly moistened.
- Rise from your chair and walk around.
OFFICE ERGONOMICS

NECK STRAIN
• Slowly turn your head from the left to the right.
• Tilt your head toward your shoulder and then roll your chin down to your chest. Do the other side the same way.

SHOULDER STRAIN
• Stretch arms as far above your head as you can.
• Place your arms at your sides and then roll your shoulders forward.
• Lace your fingers behind your head. Squeeze your shoulder blades together.

UPPER BACK STRAIN
• Lace your fingers behind your head. Squeeze your shoulder blades together.
• Extend your arms in front of you perpendicular to the floor. Lace your fingers together and push your palms away from your body.

LOWER BACK STRAIN
• Put your hands on your hips and gently bend backward.

ARM AND RIB CAGE STRAIN
• Stretch your arms overhead and hold for a bit.
• Put your hands on your hips and gently bend side to side.

FINGER STRAIN
• Clench your hand into a fist. Next splay your fingers as far as you can to stretch them.

FOREARM STRAIN
• Put your palms together in front of your chest. Keeping palms flat together, slowly lower your arms until you feel a slight stretch in your forearms.

ARM STRAIN
• Lace your fingers together, and then straighten your arms until they are perpendicular to the floor with the palms facing away from your body.

There are other exercises you can do to reduce strain. Ask your doctor for advice if there are areas which bother you. Never continue to exercise if it becomes painful or uncomfortable.

ERGONOMICS EVALUATION PROCESS
Ensure that you review “CHAT No. 32, Office Ergonomics, Part I”. Take corrective action if you notice:
1) An “evaluator” that has been listed as a risk factor.
2) Incorrect posture caused by the design of the work station.
3) Workstations that have been improperly altered.

Also, be alert for trends that reveal an increase in paid-out claims or complaints about these kinds of dangers.

If absenteeism or employee turnover is on the rise, or if the company is experiencing lower productivity and quality (particularly toward the end of a shift), then you should review the workstation ergonomics. Notify management so they can keep abreast of the situation.

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