

Ergonomics

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What Is Ergonomics?

- Ergo = work (Greek)
- Nomos = Laws (Greek)
- The study of work; laws of work design; OSHA is concerned with the study of the conditions that result in serious injury and the alternatives that minimize risk of injury.

How Ergonomics Can Help

- Fewer injuries
- Increased efficiency
- Reduced absenteeism
- Increased productivity
- Improved quality of work
- Lower turnover

What Should Ergonomics Address?

- Workplace design
- Task design
- Equipment design



Principles of Ergonomics

- Avoid static loads and fixed postures
- Provide support for limbs
- Avoid high forces and lifting
- Avoid highly repetitive tasks
- Accommodate a variety of sizes and people
 - Design for the extremes
 - Design for the average
 - Design with adjustability

Philosophy of Ergonomics

- Fit the task to the person
- Quality of working life
- Productivity
- Safe and hygienic work
- Minimize physiological and psychological stresses

Risk Factors

- Position/posture
- Repetition/frequency
- Force/exertion
- Weight/load
- Static loading/holding
- Duration
- Tools
- Environment

Occupations with High Incidence of Cumulative Trauma Disorder

- Agriculture
- Assembly work
- Auto work
- Construction
- Electronic assembly
- Textile workers



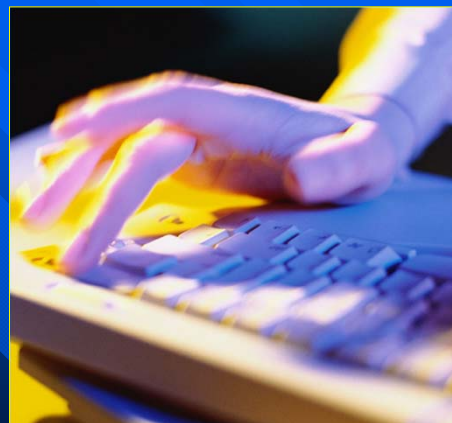
Occupations (cont.)

- Data processing
- Medical field
- Metal fabricating
- Packaging
- Postal workers



Symptoms of Carpal Tunnel Syndrome

- Pain in the wrist
- Tingling in the wrist, hands, and fingers
- Numbness in the hand and fingers
- Clumsiness in handling items
- Atrophy in the wrist area



Red Flags for Carpal Tunnel Syndrome

Individuals who:

- Have fluttering fingers
- Shake their hands during work
- Hold the sides of their wrist
- Perform deep rubbing of their arms
- Cradle their arm

Upper Limb Cumulative Trauma Disorders

- Thoracic Outlet Syndrome
- Cubital Tunnel Syndrome
- Bursitis
- Tendonitis

Office Ergonomics Concerns

- Video display terminals (VDTs)
- Filing
- Telephone use
- Noise

Seating Design

- One chair does not fit all
- Incorrect height leads to fatigue and circulatory problems
- Seat depth should be 15-17 inches
- Seat should be firmly padded with rounded front edge

Backrest Design

- Should be adjustable with lower back support
- User should “lean” against the backrest
- Should tilt to positions in back and front of the vertical position

Armrest Design

- Armrests should be provided when users arms are unsupported for long periods of time
- Adequately rounded and padded
- Should not interfere with the keyboard support surface

Keyboard and Monitor Support

- Strain on hands, arms, and wrists = CTDs
- Keyboard surfaces should be height (23"-28") and angle (0-15 degrees) adjustable
- Area should be provided for periodic support of limbs
- Monitor support should be adjustable (center line of monitor 37"-43")
- Monitor support should allow for forward, back, and angle adjustments

Keyboard and Monitor (cont.)

- Ample wrist rest areas should be provided
- Table surfaces should be matte (nonreflective)
- Ample leg and knee clearance is necessary
- Rounded corners on work surfaces
- Work surface available for reference materials
- Document holders close to screen and at same height

Keyboard

- Should be detached from monitor so that it can be adjusted independently
- Key surfaces should be concave for positioning of the fingers
- Visible surface should have a matte finish

Mouse

- Position to minimize extended reaching
- Surface area needed to support the arm

Video Display Vision

- Glare causes discomfort, fatigue, and eyestrain
- Use indirect or filtered lighting where possible
- Avoid intense or uneven lighting
- Position display surfaces 90 degrees to windows
- Drape windows with curtains or blinds
- Control shiny or reflective surfaces

Video Display Vision (cont.)

- Adjust the display brightness and contrast
- Use antireflection or antiglare filters
- Keep display screen clean
- Avoid flicker in display

Additional Ergonomic Stressors in the Workplace

- Noise
- Lighting
- Indoor air quality
- Heat/cold
- Humidity

Control Strategies

- Develop and implement control strategies to increase quality and productivity.
- Once the risk factors and their causes are identified, control strategies can be implemented based on needs.

Engineering Controls

- Appropriate initial design of the work station or work area.
- Improving the design of the existing work area or equipment.
- Providing necessary equipment and accessories.
- Adjusting the work station layout and equipment.

Administrative Controls

- Training workers in work methods.
- Varying or rotating work tasks.
- Limiting extended work hours.
- Providing mini-breaks.

Personal Protective Equipment

- PPE acts as a barrier between a person and a hazard.
- PPE is only appropriate in situations when engineering or administrative controls cannot be implemented.
- Back belts and other braces are not considered PPE. These devices should not be used in place of incorrect work techniques.

What you can do to prevent injury.

- Develop an Ergonomics program.
- Take proper breaks.
- Health and Fitness.
- Be aware of your hobbies away from work.

When Ergonomics are improved in the workplace:

- We work smarter, not harder.
- Quality, comfort and safety make us more productive and happy people.
- Stay Healthy and Safe, Take action!!!