



Ergonomics Training Seminar

Why be concerned with Ergonomics?

- Cumulative Trauma Disorders (CTD's) account for 34% of lost day injuries.
- 1 out of every 3 dollars is spent on CTD Workers' Compensation claims.
- CTD's increased 7-fold in the last ten years.

The Facts

Benefits of Prevention | Analysis of Risk

According to the Bureau of Labor Statistics (2007), the Health Care and Social Assistance industry experience

- **50,370** back injuries involving days away from work
- A **53% greater incidence rate** for injuries caused by strains and sprains
- A **59% greater incidence rate** for injuries to the back

Costs Associated with Injuries

- For employees
 - Lost time at work, lost wages
 - Quality of life, activity level
 - Physical impairment, lasting disability
- For employers
 - Insurance costs
 - Overtime, staffing costs
 - Training costs
 - Employee morale
 - Resident injuries



Understanding the Issues

- Causes of back injury (*all industries*)
 - Improper lifting techniques
 - Over-exertion
 - Poor posture
 - Slips and falls
 - Excessive weight
 - Lack of exercise
 - Stress
 - Medical factors (age, other disabilities)
 - Carrying habits (purse, briefcase, etc.)

Anticipated Benefits of Ergonomics

1. Reduced pain and suffering.
2. Reduced severity of existing CTD injuries.
3. Reduced Workers' Compensation claims and lost time workdays.
4. Reduced job turnover and absenteeism.
5. Improved employee morale.
6. Increased quality and productivity due to improved design.

What is Ergonomics?

'**Ergonomics**' is derived from two Greek words

Ergon meaning *work*

and

Nomos meaning *principles or laws*

Ergonomics = The Science of Work

What is Ergonomics?

It is the process of Fitting the Job
to the Person (instead of the
person to the job)

What is a CTD?

- Is an injury or disorder of the muscles, nerves, tendons, ligaments, joints, cartilage, blood vessels or spinal disks.
- CTD's tend to develop over time. They are also commonly called:
 - Musculoskeletal Disorders (MSD's)
 - Repetitive Stress Injuries (RSI's)

Ergonomics Addresses...

- Postures of the body as the worker performs the task.
- Movements of the body as the worker performs the task.
- Repetitiveness of the task.
- Energy expended while performing the task over time.
- Physical Strength required to accomplish the task.
- Work Area design and layout.

Ergonomics Addresses...

- Relationship between the worker and the machine, equipment, workstation and work pieces.
- Control Panel and Display design and layout.
- Pace of the work.
- Tool design and use.
- Physical and Mental effects on the worker from noise, lighting and other environmental factors.

Body Posture



Body Posture



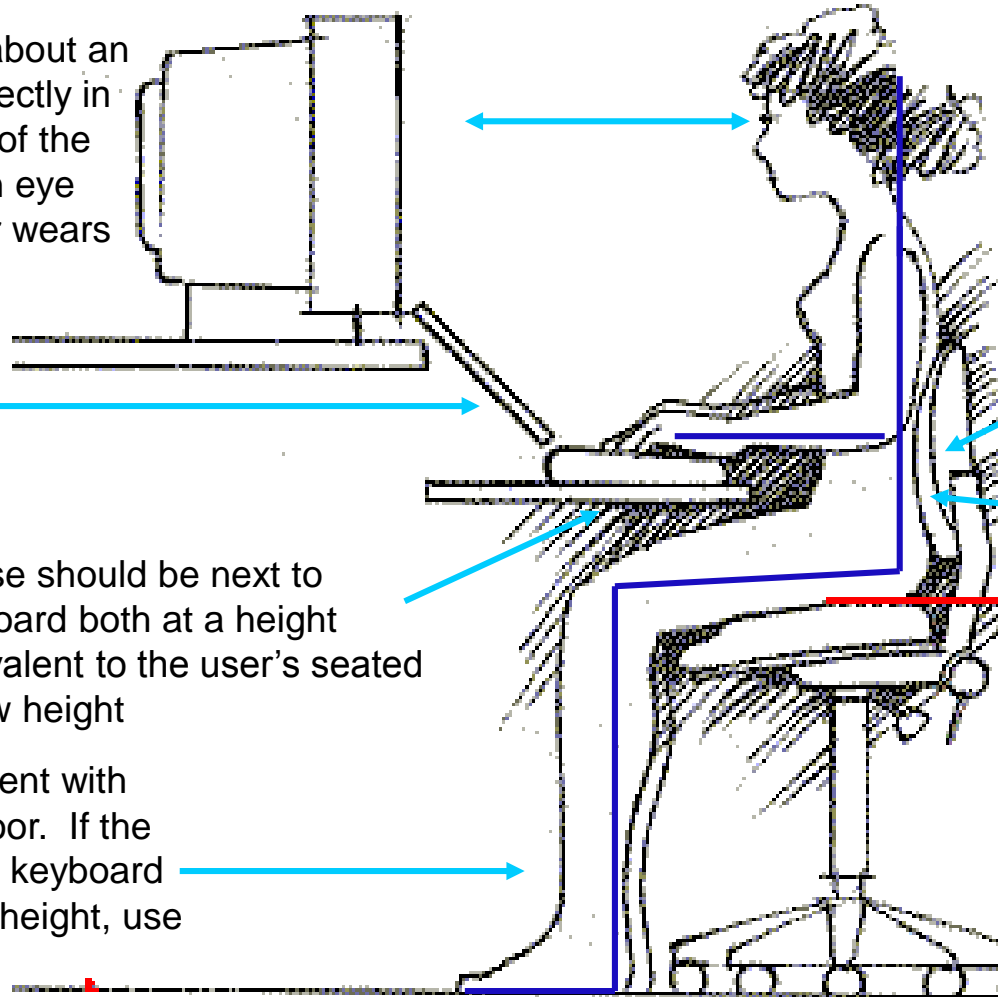
Neutral Posture for Computer Use

Position the monitor about an arm's length away directly in front of you. The top of the screen no higher than eye level (Unless the user wears bi-focal glasses)

Use a document holder close to the monitor rather than laying papers flat

Mouse should be next to keyboard both at a height equivalent to the user's seated elbow height

Knees comfortably bent with feet resting on the floor. If the chair is raised so the keyboard height equals elbow height, use a footrest.



Adjust the seat height so upper arms hang vertically, elbows bent about 90 degrees, shoulders relaxed and wrists fairly straight

Adjust the back rest to provide firm support to the small of the back

Stretching & Flexing



DAILY STRETCH AND FLEX EXERCISES

Make Stretching a Part of Your Daily Routine

Do the stretch at your own individual rate and ability. Remember, you are not competing. Stretch to the point of comfortable tension. Do not strain or bounce when stretching.

Important: If you have questions about your ability to perform any stretch, consult your physician.

UPPER BODY STRETCHES

SHOULDER SHRUG



- Look straight ahead with arms relaxed at your sides.
- Lift shoulders up toward your ears.
- Roll shoulders back as you return them to their natural position.

NECK STRETCH



- Look straight ahead, arms at your sides.
- Drop your left ear toward your left shoulder. Don't raise your shoulder.
- Take a deep breath, count to three & exhale.
- Return your head to an upright position. Don't roll your head forward or backward.
- Repeat exercise on opposite side.

BACK EXTENSION



- Stand upright with feet shoulder-width apart.
- Place both hands on the small of your back.
- Lift your rib cage arching your back.
- Take a deep breath, count to three & exhale.
- Do not tip your head back.

SHOULDER STRETCH



- Stand upright with your feet shoulder-width apart.
- Clasp your hands behind your back.
- Raise clasped hands, bending your elbows slightly until you feel a stretch.
- Don't bend your body forward during the stretch.
- Take a deep breath, count to three & exhale.

MID-BODY STRETCHES

WRIST CURL STRETCH



- With arms at your sides & your knuckles forward, make loose fists.
- Curl fists in the direction of your elbows.
- Take a deep breath, count to three & exhale.

REACH HIGH



- Stand up straight with your feet shoulder-width apart.
- Stretch your arms over your head as high as you can.
- Spread your fingers.
- Take a deep breath, count to three & exhale.

REACHING LATERAL SIDE STRETCH



- Stand upright with your feet shoulder-width apart & place your left hand across your waist.
- Reach overhead with right arm.
- Bend slightly to the left, letting the weight of your right arm create the stretch.
- Take a deep breath, count to three, exhale.
- Repeat exercise on opposite side.

LOWER SPINE & ABDOMINAL STRETCH



- Stand with your feet shoulder-width apart.
- Bend down, putting your hands on your slightly bent knees.
- Look up pointing your chin at the ceiling, creating an arch in your back.
- Take a deep breath. As you exhale, count to three, tuck your chin into your chest & round your back.

LOWER BODY STRETCHES



HAMSTRING

- Stand up straight, with your feet slightly apart. Slightly bend your left leg, putting hands on your left knee.
- Extend your right leg, keeping your heel on the floor. Look straight ahead.
- Increase stretch by bending your left knee more & pointing the toes of your right leg toward your chin.
- Take a deep breath, count to three, exhale & repeat exercise on opposite side.



QUAD

- Stand up straight with your feet slightly apart.
- Extend your left arm or use a wall for balance.
- Grasp your right ankle with your right hand & pull up toward your back.
- Keep your body in good alignment with your knees fairly close together.
- Take a deep breath, count to three, exhale & repeat exercise on opposite side.



CALF

- Stand up straight with your feet slightly apart.
- Step forward with your left foot, bend & put both hands on your left knee.
- Bend your right leg, leaning slightly forward & keeping both feet flat on the floor.
- Take a deep breath, count to three, exhale & repeat exercise on opposite side.

Build a Healthy Back

Lifestyle Implications for Prevention

- Exercise
 - Trunk strengtheners: abdominal and back exercises
- Diet and nutrition
- Quit smoking
 - Restricts blood flow; cardiac and lung complications
- Proper lifting techniques –
HOME AND WORK
 - Children, groceries, housekeeping, furniture, etc.

Build a Healthy Back

Lifestyle Implications for Prevention

- Posture
 - Standing and sitting
 - Exercise: Stand against wall and attempt to place shoulder blades against the wall. Hold for 1 minute and repeat several times a day.
- Stress
 - Restricts blood flow, tenses muscles
- Rest
 - Proper rest is vital to maintenance and function of a healthy back

Common CTD Risk Factors

- Repetition (Frequency)
- Force
- Posture
- Duration
- Mechanical Stress
- High and Low Temperatures
- Vibration

Outcomes of BAD Ergonomics

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- Physical
 - Musculoskeletal Injuries
 - Nerve Disorders
 - Fatigue
 - Heat Stress
 - Traumatic Injuries (accidents)
- Performance
 - Decreased Production
 - Poor Quality Products
 - High Scrap Rates

Cumulative Trauma Disorders Statistics

- According to BLS, the 387,820 MSD cases accounted for 33% of all worker injury and illness cases in 2011.
- In 2011, the Bureau of Labor Statistics (BLS) reported that industries with the highest MSD* rates include health care, transportation and warehousing, retail and wholesale trade and construction.

Cumulative Trauma Disorders Statistics

■ **Top 15 Occupations with MSDs**

- Nursing assistants
- Laborers
- Janitors and cleaners
- Heavy and tractor-trailer truck drivers
- First-line supervisors of retail sales workers
- Assemblers and fabricators
- Registered nurses
- Stock clerks and order fillers
- Light truck or delivery services drivers
- Maintenance and repair workers
- Production workers
- Retail salespersons
- Maids and housekeeping cleaners
- Police and sheriffs patrol officers
- Firefighters

Cumulative Trauma Disorders

- Tendinitis
- Tenosynovitis
- Bursitis
- Trigger Finger
- Epicondylitis
- Fatigue
- Strains
- Sprains
- Ganglion Cysts
- Carpal Tunnel Syndrome
- Cubital Tunnel Syndrome
- Raynaud's Syndrome
- Arthritis
- Thoracic Outlet Syndrome

Tendinitis

- Also called
 - Wrist Pain
 - Tendonitis
 - Extensor Tendinitis
- Part of Body affected
 - Wrists & hands
- Industries affected
 - Various manufacturing industries
 - Office environments
 - Warehousing
- Type of CTD
 - Involves the tendons and soft tissues of the wrist & hands
- Symptoms
 - Pain & irritation in the wrist
 - Tender & painful feeling
 - Swelling & sensation of warmth in the wrist

Some Occupations Reporting CTD's

- Parts Assembly
- Data Input Operators
- Electronic Assembly
- Machining
- Fabric Cutting/Sewing
- Flash Trimming
- Grocery Checking
- Welding
- Truck Driving
- Various Construction Trades
- Industrial Truck Operators
- Housekeeping
- Parts Inspection
- Metal Processing
- Metal Fabricating
- Postal Workers
- Textile Workers
- Tire/Rubber Workers
- Upholstery
- Warehousing
- Distribution

Carpal Tunnel Syndrome

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- Also called
 - CTS
 - Occupation Neuritis
 - Partial Thenar Atrophy
 - Median Neuritis
- Part of Body affected
 - Wrists & hands
- Industries affected
 - Various manufacturing industries
 - Office environments
 - Truck drivers
- Type of CTD
 - Involves median nerve compression in the wrist
 - Symptoms
 - Pain, numbness or tingling in the thumb, next 2 fingers and ½ of the ring finger
 - This sensation can be more severe at night
 - Loss of sensation & sensitivity to heat & cold
 - Loss of grip strength causing one to drop things

Carpal Tunnel Syndrome

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Ulnar Nerve Compression

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- Also called
 - Guyon's Canal Syndrome
 - Guyon's Tunnel Syndrome
- Part of Body affected
 - Wrists, hands & forearms
- Causes
 - Pressure at the forearm
 - Pressure at the palm of the hand.
- Industries affected
 - Various manufacturing industries
 - Office environments
- Type of CTD
 - Involves ulnar nerve compression in the forearm
- Symptoms
 - Numbness & tingling in the ring & little finger
 - This sensation can be more severe at night
 - Weakness in the hand
 - Reduction of grip strength

Tension Neck Syndrome

- Also called
 - Neck Pain
 - Cervical Syndrome
- Part of Body affected
 - Head, neck, arms & hands
- Industries affected
 - Various manufacturing industries
 - Office environments
- Type of CTD
 - Involves the muscles & nerves of the cervical spine
- Symptoms
 - Recurrent stiffness & sore muscles
 - Frequent headaches
 - Pain, numbness & tingling in the fingers

Back Pain

- Also called
 - Lumbar Pain
 - Low Back Pain
 - Sciatic Pain
 - Intervertebral Disc Pain
- Part of Body affected
 - Low back & legs
- Industries affected
 - Various manufacturing industries
 - Office environments
- Type of CTD
 - Involves the vertebral discs and nerves of the lower back (lumbar vertebrae)
- Symptoms
 - Pain in the lower back
 - Pain in the legs

Some Occupations Reporting CTD's

- Parts Assembly
- Data Input Operators
- Electronic Assembly
- Machining
- Fabric Cutting/Sewing
- Flash Trimming
- Grocery Checking
- Welding
- Truck Driving
- Various Construction Trades
- Industrial Truck Operators
- Housekeeping
- Parts Inspection
- Metal Processing
- Metal Fabricating
- Postal Workers
- Textile Workers
- Tire/Rubber Workers
- Upholstery

Who Should Get Involved in Ergonomics?

- Patient Care
 - Physicians
 - Occupational Nurses
 - Occupational Therapists
 - Physical Therapists
- Workplace Design
 - Engineers
 - Ergonomists
 - Safety Professionals
 - Industrial Hygienists
 - Workers



Introduction to Ergonomics

Review Questions

Question 1:

Define Ergonomics

Answer 1:

It is the process of Fitting the Job to the Person (instead of the person to the job)

Question 2:

Name three common risk factors causing Cumulative Trauma injuries or CTD's.

Answer 2:

- Force
- Frequency
- Posture
- Duration
- Mechanical Stress
- Temperature
- Vibration

Question 3:

Name five common
Cumulative Trauma
Disorders

Answer 3:

- Tendinitis
- Tenosynovitis
- Bursitis
- Trigger Finger
- Epicondylitis
- Fatigue
- Strains
- Sprains
- Ganglion Cysts
- Carpal Tunnel Syndrome
- Cubital Tunnel Syndrome
- Raynaud's Syndrome
- Arthritis
- Thoracic Outlet Syndrome