COMPUTER ERGONOMICS

Making Things a Little Easier
COURSE OBJECTIVES

• Understand the definition of ergonomics

• Understand Primary Causes of Cumulative Trauma Disorders (CTDs).

• Understand ways to prevent CTDs

• Learn about PC workstation accessories to reduce computer work stress

• Basic exercises to reduce / relieve ergo-stress.
DEFINITION

• The general philosophy of ergonomics is to design tools, workstations, work methods, and the ambient environments to meet the capabilities of people. Ergonomics can be broken down into its components as:
  • Erg – A unit of work
  • Nomos – The laws or study of

Ergonomics is the study of people and their work.
WHY WORRY?

- Work-related Repetitive Strain Injuries (RSI) are the fastest growing injury category, accounting for over 1.8 million annual lost workday cases.
- Up 600% over last 11 years.
- As much as $20 billion total injury cost per year. $29 K average per case compensation claim cost.
- More than 60% of all workplace injuries are attributed to RSI.
RSI INJURY DATA

• Annually, over 600,000 MSDs require time off from work.

• **Women suffer more ergonomic injuries due:**
  
  – to having jobs requiring more repetitive tasks and awkward postures
  
  – to pregnancy, premenstrual syndrome (PMS), and menopause. This is probably because of hormone changes that cause fluid retention and swelling of the tissues.
A Little Common Sense

When we prepare for an afternoon of recreational sports, most of us are concerned about getting the correct fit in our equipment. We are concerned about **MATCHING THE EQUIPMENT TO OUR CAPABILITIES** because we want to perform to our full potential. We try to find the best match between our needs and the sporting equipment we use because we know that if our shoes are too tight we will not be able to run our best and if the grip on our tennis racket is too large we will not be able to serve well. We also realize that poor equipment will not only effect our ability to perform, but if we continue to wear the tight shoes and use the oversized tennis racket, we will develop aches and pains, and in some cases, we may develop severe injuries.

The same situation exists at work.
CTD INJURY FACTORS

• Lesions to tendons of the neck, back, shoulders, arms, wrists or hands

• Primary causes:
  – Repetitive movements over long periods of time
  – Awkward postures
  – Use of excessive forces
CTD RISK CONTROL: POSTURE

• NEUTRAL & COMFORTABLE:
  – Wrists straight
  – Shoulders relaxed with elbows close to body
  – Head, shoulders & back in vertical alignment
  – Frequent breaks when bent postures can’t be avoided
ERGONOMIC ALIGNMENT

Keys to a good working environment include:
- A straight back
- A chair with a good back support
- The top of computer screens and monitors at slightly below eye level
- Elbows at a 90 degree angle
- Wrists straight and well supported
- Knees at a 90 degree angle
- Feet flat on the floor or a foot support for shorter users
CARPAL TUNNEL SYNDROME

• Occurs with repetitive motion of hands & wrists--especially with high force levels.
• Incidence up to 15% in certain industries.
• A “natural” keyboard and good wrist support can help most PC users avoid problems
• GOOD NEWS: Have dropped about 30% since 1990--which most attribute to strong workplace ergonomics programs
CTD RISK CONTROL: REPETITION

- Use automatic tools for repetitive tasks (screw and bolt tightening)
- Eliminate unnecessary tasks/movements by redesigning maintenance procedures and workstations
- Take short, frequent breaks
- Alternate tasks and processes to use different muscle groups
ERGONOMICS SUMMARY

• Good ergonomic design of tools, processes and furniture DOES improve personnel comfort, health, morale, productivity and readiness.

• Individual effort as part of a workshop team is the greatest means of identifying/improving workplace ergonomic issues.

• It’s critical to seek prompt medical aid for symptoms of ergonomic stress/CTDs
Computer Ergonomics

- Routine PC user defined as spending 20 hours or more per week working at a computer.
- Studies of PC users have not shown a risk of eye damage...although fatigue very possible.
- *NIOSH* studies have not indicated a radiation hazard nor pregnancy risk from PC usage.
- Workers using bi/tri-focal glasses before beginning PC use may need special purpose glasses for computer work.
“NATURAL” KEYBOARDS

• Three types: Fixed split, Adjustable split & “Sculptured”
• Awkward wrist postures minimized with 15 to 25 horizontal degree key split AND 8 to 66 degree vertical incline.
• Key Layout Design Changes Have:
  – increased comfort
  – improved postures
  – reduced muscle activity
  – lowered carpal tunnel pressure in lab settings
• Obtained primarily to alleviate an injury
WRIST RESTS

• No medical evidence that they reduce RSI injuries...As they work for some, but not for others

• Usage Guidelines:
  – Buy rest that is even with top of keyboard
  – Material should be “medium-soft” (foam--gel mix) so foam doesn’t break down. AVOID hard plastic types
  – DON’T leave wrists on rest...which compresses carpal tunnel. *Palm rest instead.*
  – Changing typing habits more critical than wrist support
  – MOST APPROPRIATELY USED TO REST HANDS DURING PAUSE IN TYPING

• LEARN TO TYPE CORRECTLY WITH “FLOATING WRISTS” FIRST!!!
Ergonomic chairs

- Adjustable back height
- Adjustable arm rest
- **Chair on left NOT ergonomically designed**
Alternative Pointing Devices

- Track-balls
- “Scrolling” Mouse
- Mouse pad
Other Ergonomic PC Accessories

- Height-adjustable articulating keyboard tray
MODEL COMPUTER WORKSTATION

- Keyboard trays WITH wrist support.
- Split "Natural" keyboards to facilitate neutral wrist angle
- Fully adjustable ergonomic chair
- Document holder to minimize head / eye & neck movements
- Corner desk units to position monitor directly in front of employee
- Foot rest where requested.
- Re-organization of working materials within employee arm reach.
- Alternative pointing devices (e.g., scrolling mouse or trackball devices
Questions ??... Contact Info

Department of Risk Management
Texas A&M University - Commerce
Risk Management – x5862
Safety – x8781