

ERGONOMICS



WHAT DOES IT MEAN.....?

- Derived from two Greek words:
- “Nomoi” meaning natural laws
- “Ergon” meaning work
- Hence, ergonomists study human capabilities in relationship to work demand.



Ergonomics is the science and the art of fitting the job and the workplace to workers' needs.

- It is the study of work
- It is a way to make jobs/tasks fit the employees better
- It is a way to make work easier





WHY ERGONOMICS EMERGED...?

- As early as 18th century doctors noted that workers who required to maintain body positions for long periods of time developed musculoskeletal problems.
- Within last 20 years research has clearly established connections between certain job tasks and RSI or MSD.



TYPES OF ERGONOMICS

- Physical ergonomics is the human body's responses to physical and physiological work loads. Repetitive strain injuries from repetition, vibration, force, and posture fall into this category.
- Cognitive ergonomics deals with the mental processes and capacities of humans when at work. Mental strain from workload, decision making, human error, and training fall into this category.
- Organizational ergonomics deals with the organizational structures, policies and processes in the work environment, such as shift work, scheduling, job satisfaction, motivation, supervision, teamwork, telecommuting, and ethics.



ROLE IN FSP

- As a facilities and services planner one should provide safety and work in the work station.
- The study of ergonomics enables a person to know how to provide safety for a worker and his environment.



OBJECTIVES

- The objective is to improve the efficiency of operation by taking into account a typical person's size, strength, speed, visual acuity, and physiological stresses, such as fatigue, speed of decision making, and demands on memory and perception.
- To maximize productivity while lowering the risk of Musculoskeletal Disorders (MSDs). MSDs develop as a result of long term exposure to a combination of ergonomic risk factors such as repetition, high forces and awkward postures. Examples of MSDs include carpal tunnel syndrome, tendonitis and back disorders.



EFFECTS OF ERGONOMICS

- Two classifications of ergonomic injuries
 - Cumulative Trauma Disorders (CTD's) – exposure driven
 - Strains/Sprains – instantaneous (event driven)
- Cumulative Trauma Disorders (CTD's)
 - Injury to soft tissue caused by prolonged exposure to multiple ergonomic risk factors
 - Typically develop in small body segments (i.e. fingers, wrists, elbows, and neck)



○ Examples of CTD's

• Tendon disorders:

- Inflammation of tendon and/or tendon sheathing caused by repeated rubbing against ligaments, bone, etc.
- Lateral epicondylitis (tennis elbow)

• Nerve disorders:

- Compression of nerves from repeated or sustained exposure to sharp edges, bones, ligaments, and/or tendons
- Carpal tunnel syndrome

• Neurovascular disorders:

- Compression of blood vessels and/or nerves from repeated exposure to vibration or cold temperatures
- Raynaud's phenomenon (white finger syndrome)

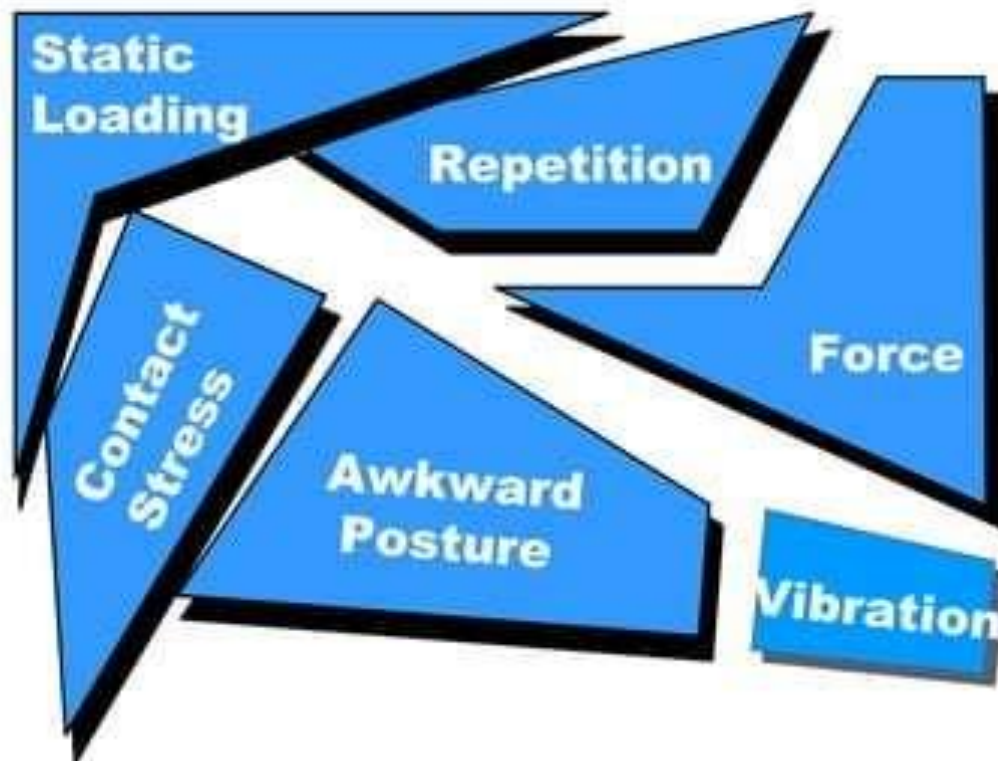


○ Strains & Sprains

- Injury to connective tissue caused by single forceful event: lifting heavy objects in awkward position
- Common to large body segments (i.e. back, legs, and shoulders)
- Risk of injury increases with the presence of multiple risk factors



ERGONOMIC RISK FACTORS



Risk of injury increases with:

- Prolonged exposure to any of these ergonomic risk factors
- Presence of multiple risk factors within a single job task



WHAT TO DO.....?

PREVENT,PREVENT,PREVENT

- P Warm up & stretch before activities that are repetitive, static or prolonged
- i Take *frequent breaks* from ANY sustained posture every 20-30 minutes
- Respect pain- positions or stop painful activity
- s Recognize early signs of inflammatory process, & tx early
- s Be aware of workstation environment.



HOW TO REDUCE MSD

- ➔ Post your group's BODY MAP on the wall.
- ➔ Compare the BODY MAPS.

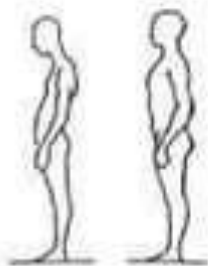
What seems to be the same about the BODY MAPS?

What do the BODY MAPS tell us about construction work?



MAINTAIN NEUTRAL POSTURE

- a) **Maintain erect position of back & neck w/ shoulders relaxed**
- b) **Position equipment & work directly in front of and close to your major tasks**
- c) **Keep upper arms close to the body, elbows 90-100 degrees**
- d) **Keep feet flat on floor, upper body weight resting on “sits bones”**
- e) **Wrists as neutral as possible; safe zone for wrist movement is 15 degrees in all directions**



MSDs (Musculoskeletal Disorders)

A study done by the University of Iowa has shown that construction workers *hurt!*

- 70% report pain in their lower back
- 46% report pain in their knees
- 43% report pain in their wrists and hands
- 42% report pain in their shoulders and necks



(The University of Iowa Construction Survey, 1996)



Avoid bending neck forward for prolonged periods of time (*remember *quadruple* the force); use a copy holder

- P Avoid static positions for prolonged time; muscles fatigue---MOVE to circulation!





MODIFY TASKS.



Alternate activities frequently; rotate heavy &/or repetitive tasks w/ lighter less repetitive ones.

- t If sx become worse *REASSESS* task setup & look for alternative methods
- t Avoid repetitive or prolonged grip activities
Avoid pinching w/ wrist in flexion or wrist deviation (bending to side)
- n Take *frequent breaks* to stretch & rest hands



ERGO REMINDERS

Ergo Reminder™

Keep your
elbows close
by your side.



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Ergo Reminder™

Keep your wrists
comfortably straight.



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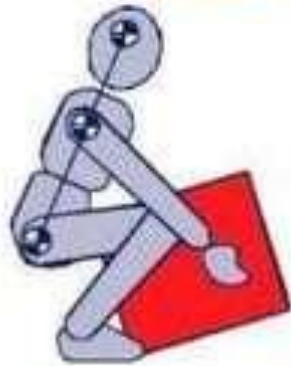
Ergo Reminder™

Avoid reaching out
for the mouse or
keyboard.

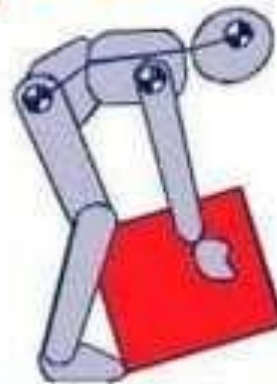


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CORRECT & INCORRECT TECHNIQUES



Correct lifting technique



Incorrect lifting technique



The wrong way!



The right way!

Practice Wellness at Work and Home !

Exercise



Body

Nutrition



Mind

Relaxation



Spirit



MOVE



STRETCH

Stress Tips from the Field

**Don't Forget
to Breathe**



ADVANTAGES

- A successful ergonomics program utilizes the skills of many disciplines, including engineering, psychology, medical, safety, management and the employees or associates
- Applications range from the design of work areas (including office furniture, automobile interiors, and aircraft cockpits) to the disposition of switches and gauges on the control panels of machinery to determining the size, shape, and layout of keys on computer terminals and character height, color, and clarity on video displays.




ADVANTAGES

- The **benefits** of applying ergonomic principles:
 - Maximize productivity, efficiency and quality;
 - Reduce MSD risk by eliminating or minimizing ergonomic risk factors;
 - Improve employee morale; and
 - Cost savings associated with injury-related absenteeism, treatment, new hire training and WCB claims.
- It can help you do work safely
- It can make you more comfortable
- It can prevent injuries



SUMMARY

- Minimize ergonomic risk factors in your area
 - Stretch throughout the shift especially before and after activities that require awkward positions or lifting
 - Pay attention to your body and know your physical limitations
 - Report ergonomics issues through appropriate channels.
 - Ergonomic injuries are preventable, and you own your own safety
- 

AN OUNCE OF PREVENTION
IS WORTH A POUND OF
CURE !



THANK YOU

