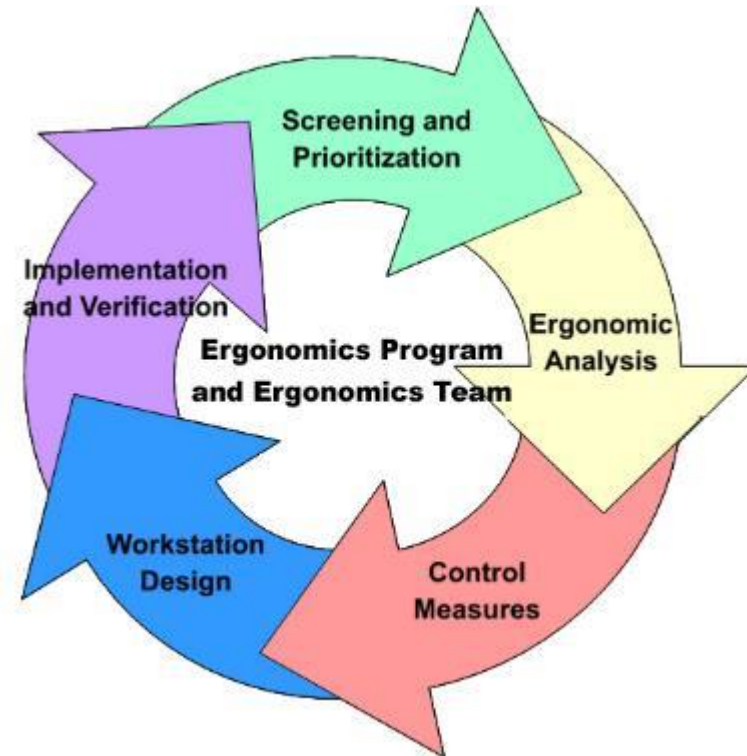


# ERGONOMICS



- Hazard Identification
- Musculoskeletal Disorders
- Effects of Cold, Noise & Lighting
- Life Factors
- Engineering & Administrative Controls



# What is Ergonomics?



*Ergonomics*: The science of fitting jobs to people. Encompasses the body of knowledge about physical abilities and limitations as well as other human characteristics relevant to job design.

*Ergonomic design*: The application of this body of knowledge to the design of the workplace (tasks, equipment, environment) for safe and efficient worker use.

*Good ergonomic design*: Makes the most efficient use of worker capabilities while ensuring job demands do not exceed those capabilities.

Musculoskeletal disorders (MSD's) are injuries or illnesses to soft body tissue such as:

- Muscles
- Nerves
- Tendons
- Ligaments
  - Joints
  - Cartilage
- Spinal Discs

MSD's *do not include* injuries caused by slips, trips, falls, or other similar accidents.

MSD's can differ in severity from mild periodic symptoms to severe chronic and debilitating conditions.



# MSDs – Signs & Symptoms

- Aching
- Burning
- Cramping
- Loss of Color
- Numbness



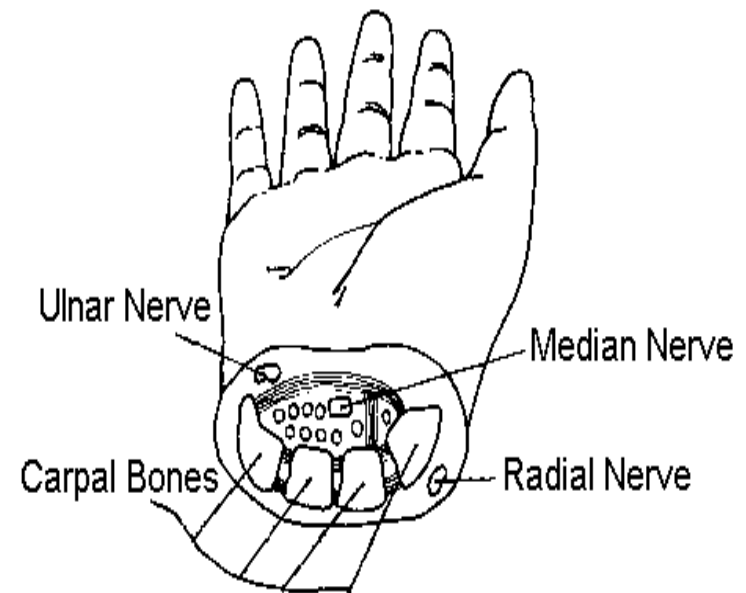
# MSDs – Signs & Symptoms

- Pain
- Swelling
- Stiffness
- Tingling
- Weakness



# MSDs-Carpal Tunnel

- Carpal Tunnel – a tunnel in the wrist through which the median nerve and nine digital flexor tendons pass.
- Formed by the wrist bones and a dense trans-carpal ligament.
- Continued and repetitive pressure on the median nerve in the carpal tunnel can cause Carpal Tunnel Syndrome (CTS).





- If you do the same tasks with your hands over and over, try not to bend, extend, or twist your hands for long periods.
- Don't work with your arms too close or too far from your body.
- Don't rest your wrists on hard surfaces for long periods.
- Switch hands during work tasks if possible.

- Take regular breaks from repeated hand movements to give your hands and wrists time to rest.
- Don't sit or stand in the same position all day.
- Adjust your chair so your forearms are level with your keyboard and you don't flex your wrists to type.

# MSDs-Back Injuries

Heavy lifting from above the shoulders.

Heavy lifting from below the knees.

Twisting while lifting/carrying.

Bending over at the waist.

→ → → → → → → → →

Carrying objects to one side.



## Lifting

- Avoid bending at the waist.
- Squat down with your back straight & knees bent.
- Grasp the object.
- Bring it close to your body.
- Slowly rise.
- Let your thigh muscles do the lifting.



## Standing

- Shift your weight slightly
- Use proper footwear with cushioned insoles
- Avoid high heels
- Proper posture when standing =
  - Shoulders not rolled forward
  - Stomach area pulled in
  - Small of the back straight
  - Hips not tilted

# Sitting Posture



- Sit close to your desk so you don't have to bend forward.
- If you do bend, bend from your hips.
- Position your work or chair so you can look forward rather than down.
- Use a document holder or move your computer screen so the top of it is at eye level.
- Shift your position frequently to prevent strain.
- Take a break or do stretching exercises.

- Use a straight chair with support for your lower spinal curve.
- Use a small cushion or rolled up towel behind your back to maintain the proper curve.
- Check the seat's height.
- Adjust your seat so that your knees are equal with or slightly lower than your hips.
- If the seat's height is not adjustable use a footrest if necessary.
- Keep your feet flat; avoid crossing your legs.
- Keep your ankles and elbows at right angles.

- Joints involve many structures, including tendons, muscles, nerves, and bones.
- Inflammation may be caused by joint damage or repetitive heavy use.
- With inadequate repair, cartilage thinning may lead to osteoarthritis.



- Work tasks that may be associated with lower-extremity joint loading: Repetitive/prolonged stair or ladder climbing, kneeling, squatting, standing, carrying heavy loads, jumping.
- Mechanical stresses associated with certain tasks can cause degenerative joint disease.
- Degenerative joint disease can occur even after relatively low loads on joints if the forces are applied impulsively and repetitively.

# MSD Risk Factors-Avoid:

- Bent wrists
- Twisting at the waist
- Rolled shoulders
- Leaning forward
- Bending at the waist



# MSD Risk Factors-Avoid:

Avoid:

- Winged elbows
- Overreaching
- Stepping backwards
- Locking your knees



## Lifting

- Place heavier material above the knees and below shoulder height
- Use team lifting
- Use mechanical devices such as tool supports, platforms lifts, barrel lifts, air lifts, and hoists

## Moving

- Lower required force by using carts, trolleys, pallet jacks, conveyors and tracked lifts

Hazards = Damage to Nerves & Blood Vessels

- External Compression – sharp edges concentrate forces on a small area of the anatomy resulting in high, localized pressure.
- Internal Compression – nerves, vessels, and other soft tissues may be internally compressed under conditions of:
  - *High-force exertions*
  - *Awkward postures*
  - *Static postures*
  - *Swelling of injured tissue*
  - *High velocity or acceleration of movement*

# MSD Risks

- Cold
- Noise
- Lighting



# Life Factors

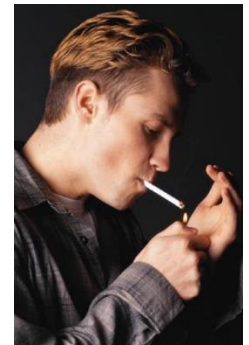
## Exercise:

- Improved health & Stronger body
- Improved endurance & Reduced stress
- Better range of motion



## Smoking:

- Restricts blood vessels & Carbon Monoxide in blood
- Longer recover time from injury
- Poor general health



## Medication:

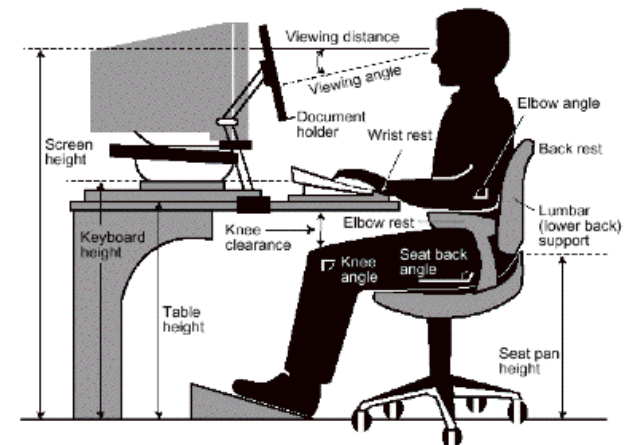
- Could raise or lower blood pressure
- Could mask pain
- Could affect eyesight



Engineering controls include changing, modifying or redesigning of:



- Workstations
- Tools
- Facilities
- Equipment
- Materials
- Processes





Administrative controls = procedures and methods that significantly reduce daily exposure to WMSD hazards by altering the way in which work is performed.

### Examples:

- Employee Rotation
- Job Task Enlargement
- Adjustment of work place
- Redesign of work methods
- Alternative Tasks
- Rest Breaks

# Prevent, Prevent, Prevent



- The bottom line: prevent accidents and injuries from occurring!
- Ensuring your workstation is ergonomically designed is one method to prevent injuries.
- All employees need to have a basic understanding of ergonomics, and should report any ergonomic hazards to their Supervisor immediately.

- Repetitive motion tasks can lead to Musculo-Skeletal Disorders (MSD's).
- Maintain correct posture while sitting, standing and walking.
- Stretch to “limber up” muscles before *and* after work.
- Take regular breaks.

- Exercise regularly.
- Ensure your workstation is set up ergonomically correct for you.
- Ensure lighting in your work area is adequate.
- Report ergonomic hazards or symptoms to your Supervisor.

# Contact Information



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# Questions

