Ergonomics

What is Ergonomics?

- The study of work and the relationship of work to the physical and cognitive capabilities of people

- Fitting the job (tools, tasks, and environment) to the employee, instead of forcing the worker to fit the job

Ergonomic Injuries

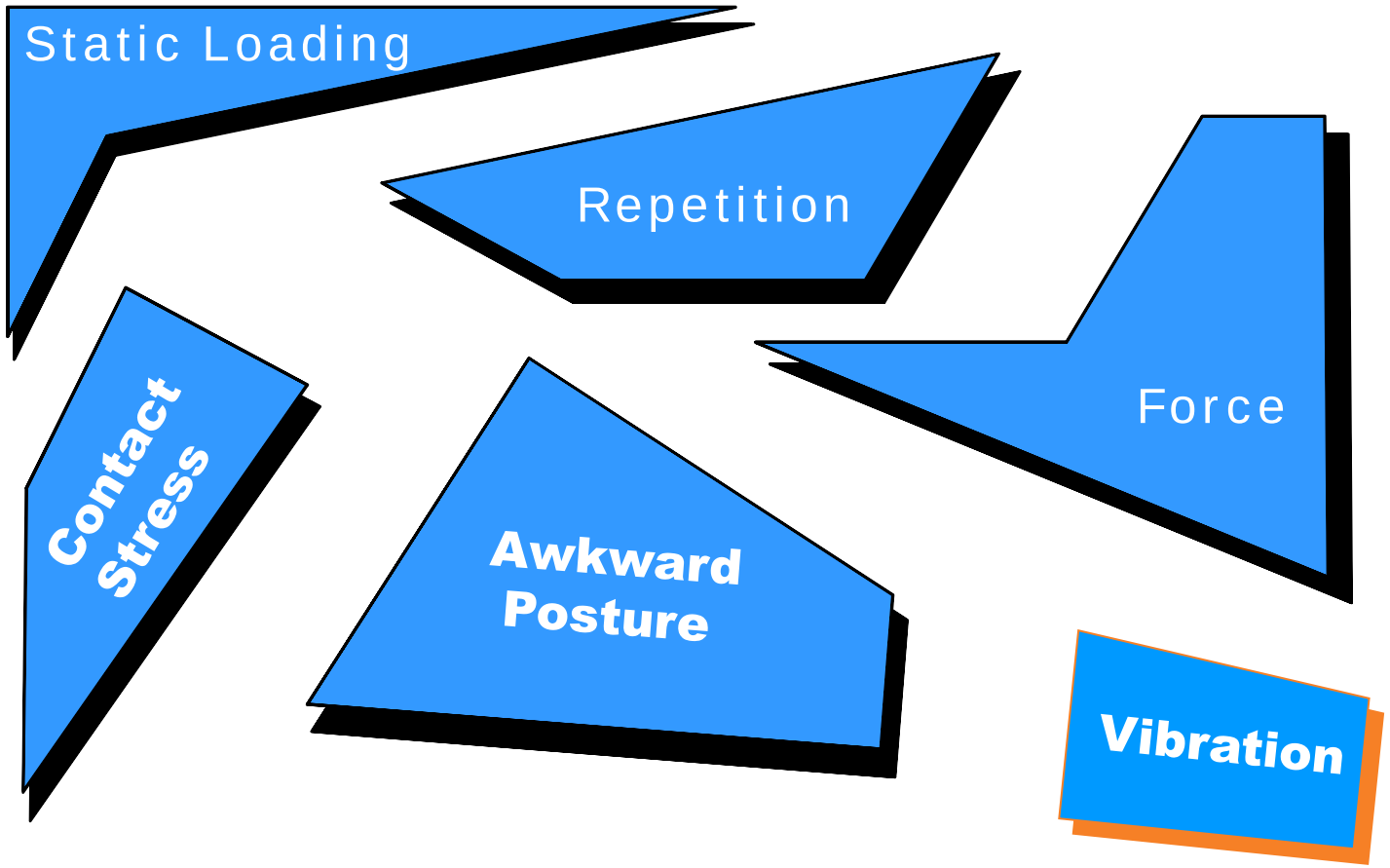
Musculoskeletal Disorders (MSD's)

- Injury to soft tissue caused by prolonged exposure to multiple ergonomic risk factors
- Also referred to as Cumulative Trauma Disorders (CTDs)
- Can affect back, shoulders, arms, wrists, neck, etc.

Early Reporting of Ergonomic Issues

- Proactive Reporting:
  - Report suspected ergonomics risk factors to your supervisor and safety committee representative.
- Early Reporting Process:
  - Report pain or discomfort associated with work to your supervisor or other designated person.
- Benefits to Early Reporting:
  - Leads to early care and quicker healing, preventing chronic problems.
  - Leads to quicker identification of the root cause of the injury.
  - Will initiate an ergonomics evaluation by trained personnel.

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

Ergonomic Tips to Minimize Awkward Postures

- Work near elbow height to avoid bending excessive bending

- Avoid overhead reaching and kneeling when possible

Ergonomic Tips to Minimize Awkward Postures

- Select the correct tool handle orientation based upon work surface height/orientation (when possible)

Pistol grip

In-line grip

Primary Use	Surface Orientation	Select this tool type
Above shoulder height	vertical surface	in-line grip
	horizontal surface	pistol grip
Between elbow and shoulder height	vertical surface	pistol grip
	horizontal surface	in-line grip
Below elbow height	vertical surface	in-line grip
	horizontal surface	pistol grip

Ergonomic Tips to Minimize Awkward Postures

Where awkward postures are unavoidable, change tasks, stretch, and take short breaks frequently

The use of stretching may be appropriate as part of a comprehensive ergonomic program. Stretching must not be used in place of engineering and or administrative improvements.

Ergonomic Tips to Minimize Force

- Use mechanical lift assists and carts when available
  - Avoid manually handling heavy objects (more than 35 pounds)
  - Avoid carrying objects more than 100 feet
- Practice proper cart handling
  - Push instead of pulling
  - Use both hands when pushing
  - Stand directly behind the cart when pushing (avoid twisting your body)
  - Maintain good control and limit speed
  - Ensure cart is not overloaded

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Ergonomic Tips to Minimize Force

When lifting

- Get a secure grip.
- Use both hands whenever possible.
- Avoid jerking my using smooth, even motions.
- Keep the load as close to the body as possible.
- To the extent feasible use your legs to push up and lift the load, not the upper body or back.
- Do not twist your body. Step to one side or the other to turn.
- Alternate heavy lifting or forceful exertion tasks with less physically demanding tasks.
- Take rest breaks.

Ergonomic Tips to Minimize Force

A Two-Person Lift Is Appropriate When. . .

- A lift, hoist or other mechanical assistance is unavailable
- The object is heavier than you are capable of lifting alone (typically more than 35 pounds)
- The object is not heavier than what two people are capable of lifting (typically less than 60 pounds)
- The object is awkward or oversized.
- Any object that does not have its weight equally distributed within the load.
- **Remember some objects are too heavy or awkward to be handled with two people**

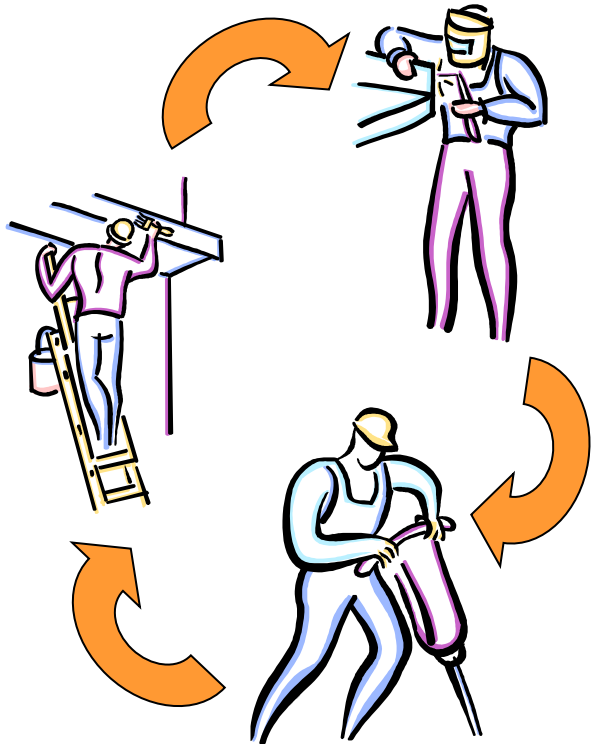
Ergonomic Tips to Minimize Force

- Use the correct tools / powered tools for the task
  - Powered tools tend to require less exertion to perform a task
  - Ensure that the weight of a powered tool (and cording) does not create additional force issues
- Use only the amount of force necessary to complete the task

Ergonomic Tips to Minimize Repetition

Repetition:

- Use power tools when available
- Change tasks or take a break from repetitive tasks
- Follow job rotation policies where applicable – effective job rotations work alternate muscle groups between successive job functions



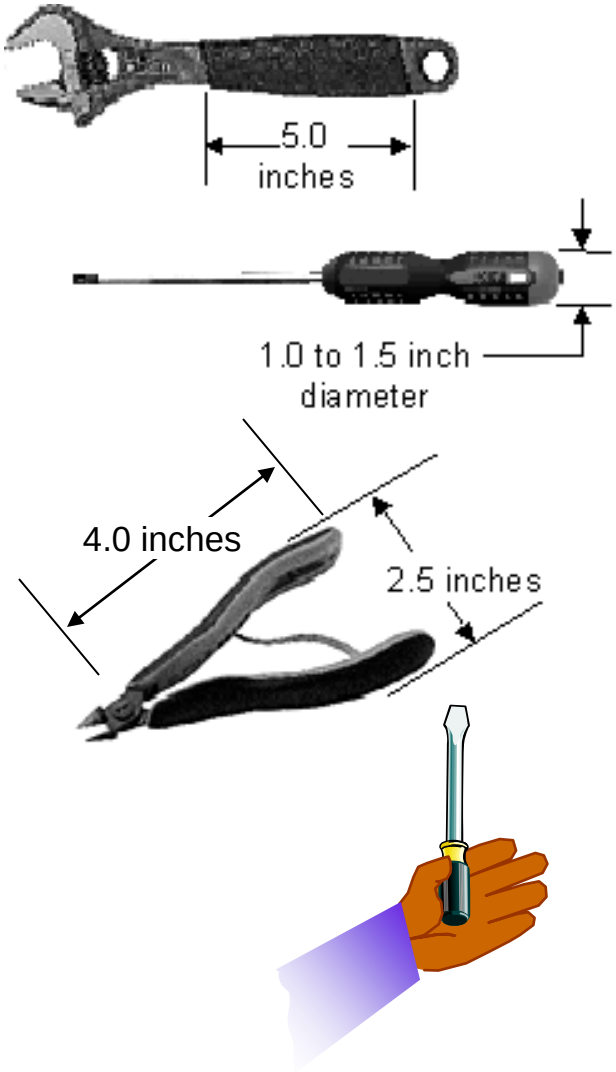
Ergonomic Tips to Minimize Static Loading

Static Loading:

- Avoid prolonged awkward postures
- Change the position of the work or your body position to get as close as possible to the work area
- If prolonged awkward postures are unavoidable, use a “supported” posture to compensate
- A supported posture uses part of your body to support the weight of another body segment that is in an awkward position

Ergonomic Tips to Minimize Contact Stress

- Select hand tools that conforms to the geometry of the hands
- Pistol grip & in-line tools:
  - Recommended handle length: 5.0 inches
  - Recommended handle diameter: 1.0 to 1.5 inches
- Pliers & crimping action tools:
  - Recommended handle length: 4.0 inches (minimum)
  - Recommended handle span: 2.5 inches
- Avoid handles that end in the palm of the hand



Ergonomic Tips to Minimize Contact Stress

- **Avoid pressure on palms, wrists, and elbows:**
  - Use padding on hard or sharp surfaces
  - Change your position to eliminate the stress
- **Avoid pressure on knees:**
  - Avoid kneeling on hard surfaces for prolonged periods
  - Use knee pads when kneeling tasks are unavoidable

Ergonomic Tips to Minimize Vibration & Torque

- **To lessen vibration:**
  - Pad tool handles with a soft compressible surface
  - Use vibration damping (gel filled) gloves
  - Select tools (hammers and chippers) with built in damping systems (springs/hydraulics)

- **To lessen torque reaction:**
  - Use electric tools as opposed to air driven tools
  - Use pulse tools or auto-shutoff tools

Summary

- Minimize ergonomic risk factors in your area
- 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

Discussion/Questions?

References:

1. National Institute for Occupational Safety and Health (NIOSH) Ergonomic Guidelines for Manual Material Handling

2. Oregon Occupational Safety and Health Administration (OSHA) Construction Ergonomics