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

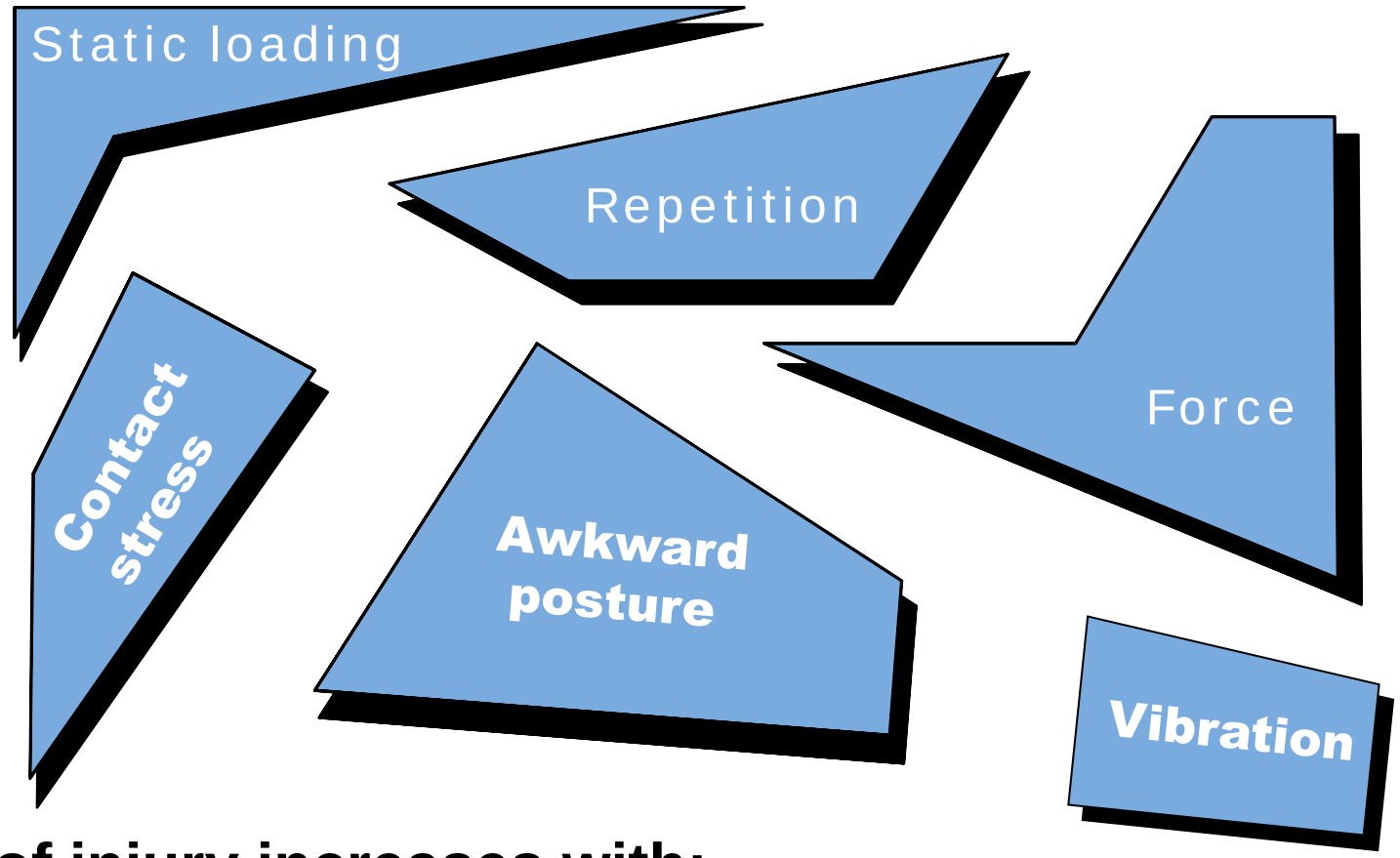
Musculoskeletal Disorders (MSDs)

- 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 include:
  - 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

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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.**

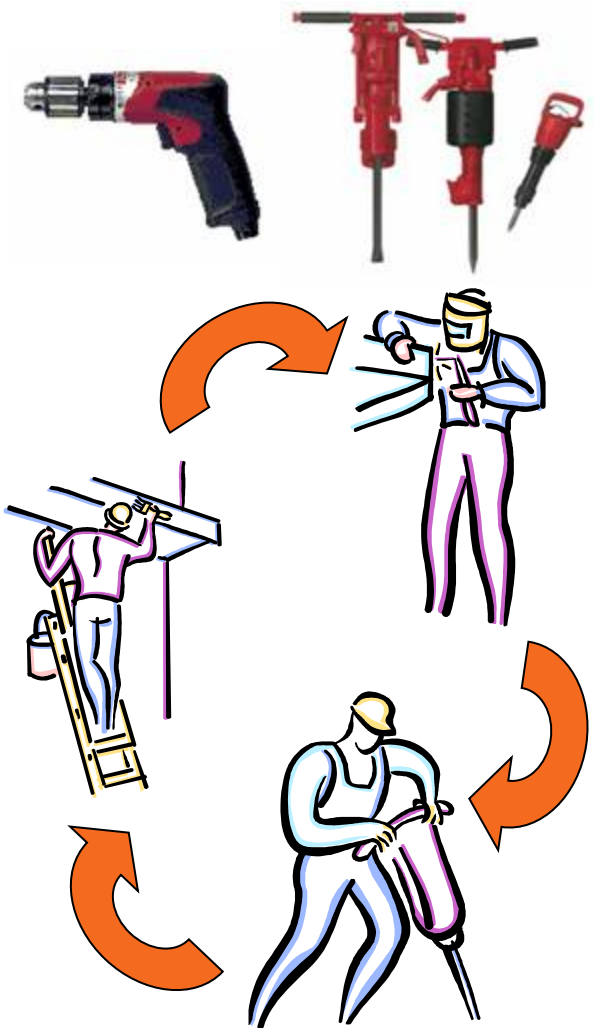
Ergonomic Tips to Minimize Force

- 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.



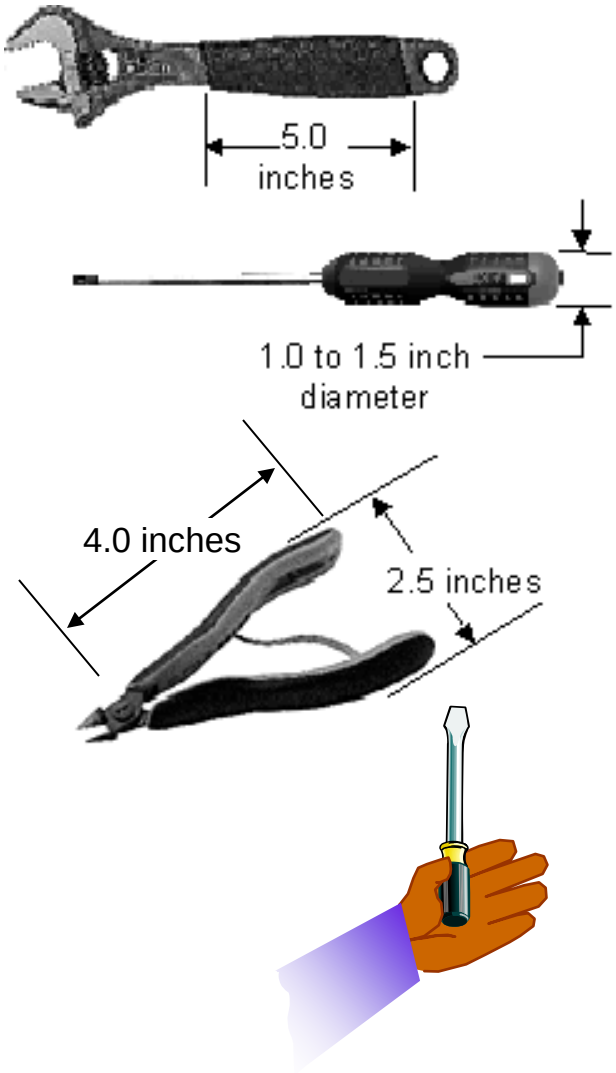
Ergonomic Tips to Minimize Static Loading

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 conform to the geometry of the hands.
- Pistol grip and in-line tools
  - Recommended handle length: 5.0 inches
  - Recommended handle diameter: 1.0 to 1.5 inches
- Pliers and 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