

It's a fact...

Proper use of hand tools can make your work safer and easier.

Hand tools, in one form or another, are used in all occupations, and are designed to extend and reinforce the range, strength, and effectiveness of a person's upper limbs. However, poorly designed tools or risk factors—such as awkward positions, mechanical compression, vibration, and forceful exertions—can lead to injuries, accidents, and work-related musculoskeletal system disorders (WMSDs). The duration of exposure to these risk factors may also affect the worker by increasing local and generalized fatigue and tissue stress.

Shortcomings in hand tool design are generally easy to identify and correct:

- ◆ Use special purpose tools.
- ◆ Use lightweight, well-balanced, or counter-balanced tools.
- ◆ Use a tool balancer, holder, or jig if prolonged use or holding is required.
- ◆ Use powered hand tools whenever possible.
- ◆ Use the best grip for the task (e.g., a "power grip" when high force is required).
- ◆ Use only tools that have the appropriate handle thickness, shape, and length for the job. Also, the tool handle should—
 - Distribute the hand-force concentration over a greater surface area.
 - Be comfortable to hold and well rounded.
 - Reduce compressive forces on the hand surface.
 - Be long enough to distribute forces over the large, fleshy areas at the base of the thumb and little finger.



Use the right tool for the task. Position the work piece properly to make the job even easier.

- ◆ If a tool is used with gloves, choose a handle thickness, shape, and material to allow safe and comfortable use with the gloves.
 - **Correct size** – If gloves are too big, you have to work to keep the gloves on your hand. If they're too small, the gloves will constrict your fingers.
 - **Flexibility** – Stiff gloves require extra effort and energy to move.
 - **Grip surface** – Gloves should have a grip surface so items won't move around in your hand.
- ◆ Use tools with compressible and nonconductive handles, and without sharp edges.
- ◆ Select tools that minimize stress on muscles and tendons. You should be able to keep the wrist in a neutral or relaxed position during tool use.
- ◆ Allow for adequate finger clearance if trigger use is required, or increase the size of the trigger so more than one finger can be used.
- ◆ Properly calibrate and maintain all tools.

Using properly designed tools based on the task and worker's characteristics (e.g., hand dimensions and strength) significantly reduces the risk of WMSDs. Moreover, tools that fit in the hand comfortably will ultimately result in increased productivity.

Finding Out More



Fact Sheet 2: You should know about work-related musculoskeletal disorders.

Fact Sheet 3: You should know about carpal tunnel syndrome.



This fact sheet is a product of the DoD Ergonomics Working Group and was adapted from their June 2000 publication, *Preventing Work-Related Musculoskeletal Disorders in the Workplace*.

Written for both supervisors and workers, this fact sheet provides basic information on ergonomics. For more information, visit the working group's Web site at <http://chppm-www.apgea.army.mil/ergowg/product.htm>.