





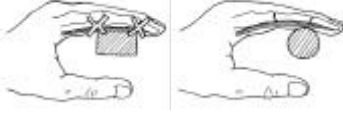
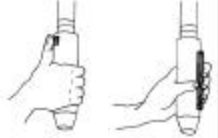




HAND TOOL USE AND SELECTION PRINCIPLES

(Adapted from NIOSH Elements of Ergonomics Programs – Toolbox Tray 9-C)

Modified by EWI Works – January, 2002

	<p>Maintain straight wrists. Avoid bending or rotating the wrists: bend the tool, not the wrist.</p> <p>A variety of bent-handle tools are commercially available.</p>		<p>Avoid static muscle loading. Reduce both tool weight and size. Do not raise or extend elbows when working with heavy tools. Provide counter-balanced support devices for larger, heavier tools.</p>
 <p>Grip Too Small</p>	<p>Avoid stress on soft tissues from poorly designed tools exerting pressure on the palms or fingers (ie: short-handled pliers or tools with finger grooves that do not fit the worker's hand).</p>		<p>Reduce grip force requirements. The greater the effort to maintain control of a hand tool, the higher potential for injury. A compressible gripping surface rather than hard plastic may alleviate this problem.</p>
	<p>Maintain optimal grip span. Optimum grip spans for pliers, scissors or tongs, measured from the fingers to the base of the thumb, range from 6 to 9 cm.</p>		<p>The recommended handle diameters for circular-handle tools such as screwdrivers are 3 to 5 cm when a power grip is required, and .075 to 1.5 cm when a precision finger grip is needed.</p>
	<p>Avoid sharp edges and pinch points. Select tools that will not cut or pinch the hands even when gloves are not worn.</p>		<p>Avoid repetitive trigger-finger actions. Select tool with large switches that can be operated with all four fingers. Proximity switches are the most desirable triggering mechanism.</p>
	<p>Wear gloves that fit. Gloves reduce both strength and dexterity. Tight-fitting gloves can put pressure on the hands, while loose-fitting gloves reduce grip strength and pose other safety hazards (e.g., snagging).</p>		<p>Isolate hands from heat, cold and vibration. Heat and cold can cause loss of manual dexterity and increased grip strength requirements.</p> <p>Excessive vibration can cause reduced blood circulation in the hands causing a painful condition known as white-finger syndrome.</p>