# Tool Safety

Cumulative trauma disorders, (CTS) are often a result of workers using poorly designed tools or from using the wrong tool for the job. Using the tool for something other than the task it was designed for will force the body into awkward positions and lead to pain and injury.

The risk factors associated with hand tool problems include:

- hand/wrist position
- grip - force requirement
- handle design

## Hand/Wrist Positions

Regardless of what tool is being used, wrist(s) should be kept straight. To reduce the potential for injury you should think about: how you hold the object you are working on, the position of your hands and wrist, and the tool that you are using on the object.

In some cases, when working on an object, vises may be used to secure an object. The vise allows the worker to manipulate the object rather than the body thereby avoiding awkward postures and hand positions.

## Grip – Force Requirement

The force necessary to perform a task is related to hand position(s), the tool or object being grasped, and the friction between the hand and tool.

If a large, downward force is required, a flange[1] will decrease the amount of force necessary to maintain a grip. Screwdrivers are examples of tools that should have flanges at the bases of the handles to keep the hand from slipping and becoming injured.

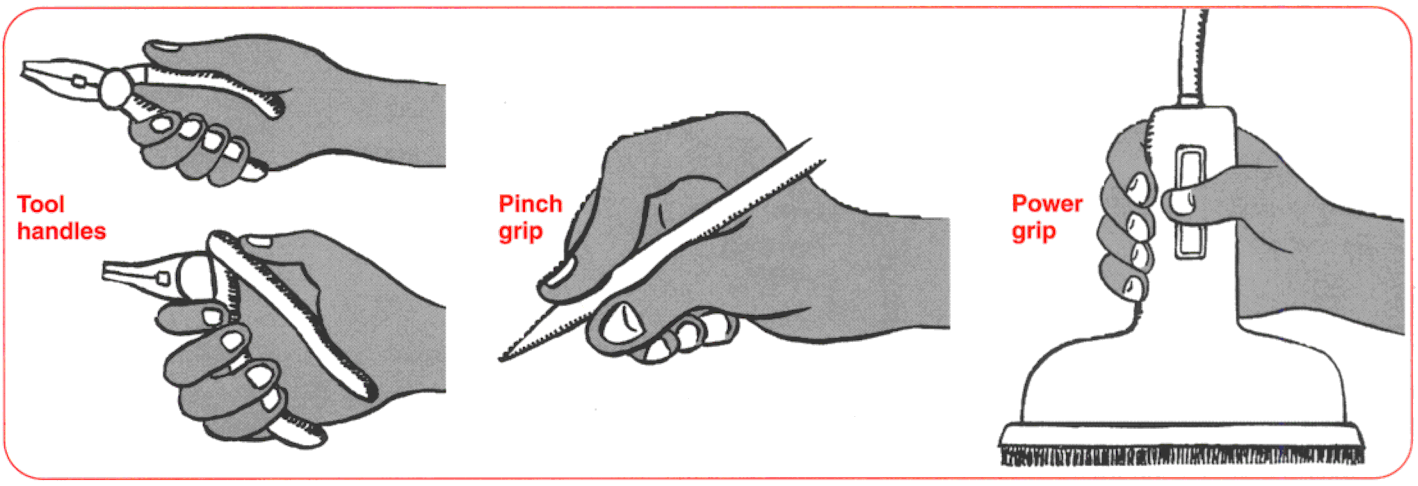
[1] a rim used for strengthening or guiding something.

Tools should be held at the center of gravity so that the weight does not cause the worker to drop the tool. A well-balanced tool will easily stay in the proper position with no effort required from the worker's hand(s) to balance the tool. A well-balanced tool prevents the extra strength required to hold an unbalanced tool in place while operating it.

If the tool is not well balanced, modifications can be made:

1. Stands can be designed to support the weight of the tool. A stand will allow the worker to easily guide the tool while relieving the stress exerted on the muscles of the back, neck, and arms.
2. Support handles on tools allow workers to support the weight of the tools with both hands.
3. The cord of a power tool can displace the balance of a tool. Suspending the cord on a ring above the worker's head will allow the worker more flexibility and manipulation.
4. Heavy tools can be suspended with balancers.

Workers need to exert more force when using non-powered tools. Workers must avoid awkward hand positions and pressure on tissues and joints when using non-power tools.



Sharp edges on corners or hand tools or work surfaces exert pressure on the sides of the fingers, wrists, and forearms causing damage to the nerves and blood vessels located close to the top layers of the skin.

## Tool Handles

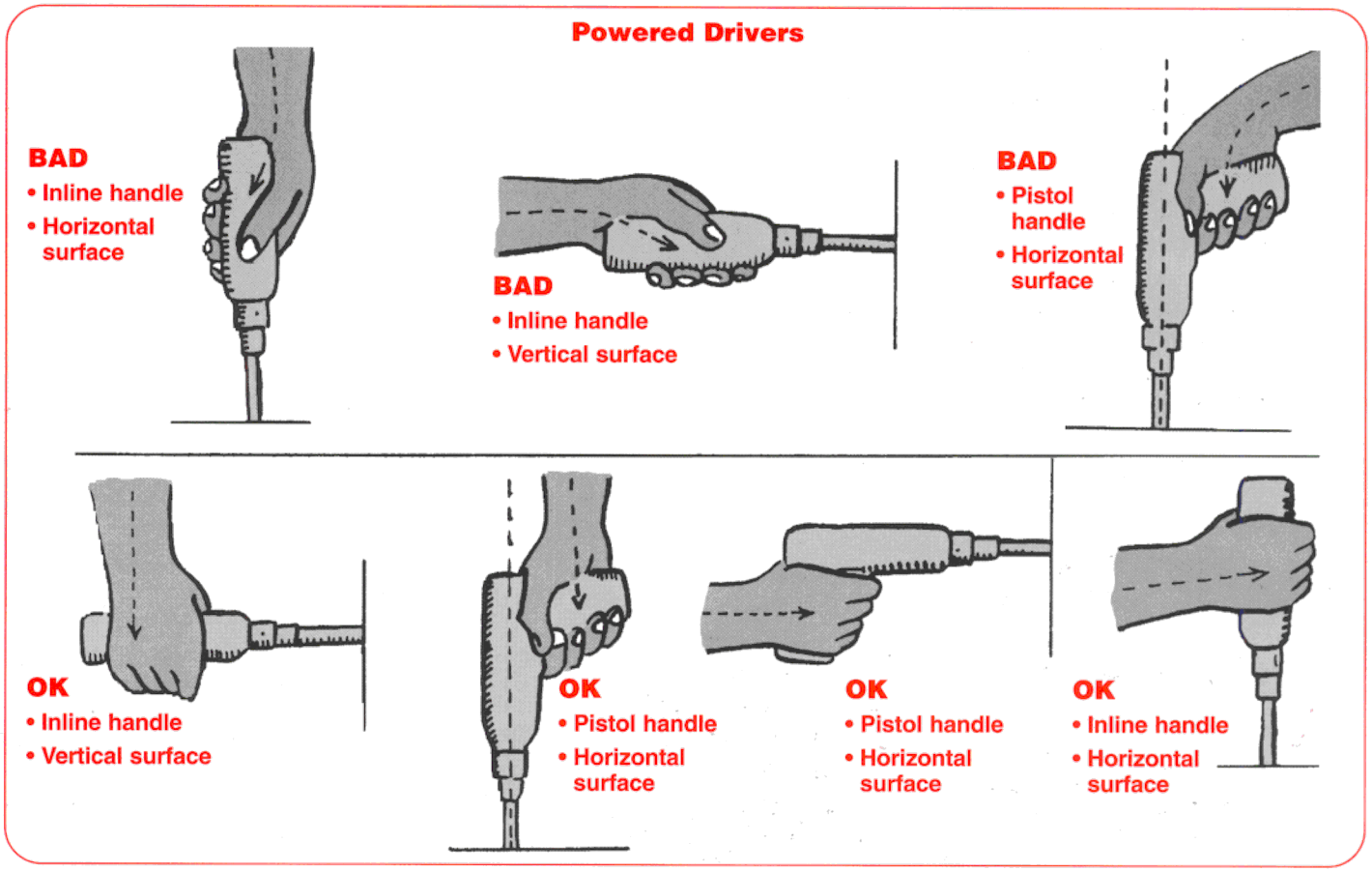
The way a tool is gripped can prevent wrist problems. A good grip design on the handle is one that will keep the worker's grip as straight as possible. Gripping with the full hand instead of one or two fingers allows the worker to use more power while reducing stress on the tendons of the fingers.

The handle of any tool should be:

- Long enough to pass along the whole hand/palm. The tool should not dig into a worker's palm.
- Without sharp edges or areas that dig into the fingers or palm of the hand.
- Without grooves. Grooves add extra pressure because hands vary in size and do not always conform to the grooves.
- Oval or cylindrical to reduce grip – force requirements.
- Fitted with finger stops at the base to allow for better control of the tool and decrease the amount of force needed for the grip.
- Covered with material that produces a slight amount of friction. The material should be able to breath but not allow penetration of oils, chemicals and sharp objects.

## To minimize the potential for pain and injury, consider the following:

- Use power tools where possible.
- Use mounted or suspended tools that require several fingers to operate.
- Use tools that can be used with either hand.
- Wear gloves to protect hands from heat and cold.
- Choose the right glove. When working with tools, gloves can reduce manual dexterity, decrease tactility of the hands, and increase grip force requirements.




"Powered Drivers" courtesy of the United Brotherhood of Carpenters, Health and Safety Fund.

This factsheet was produced through a grant from the NYS Department of Labor, Occupational Safety & Health Training and Education Program (C7666) by District Council 37, AFSCME, Education Fund, Safety & Health Unit.