The Canadian Centre for Occupational Health and Safety
(CCOHS) promotes a safe and healthy working environment by providing information and advice about occupational health and safety.

Mouse Talk: A useful tool made more bearable

The computer has proven to be a major time saver for navigating files and documents since its popularity skyrocketed in the 1990s. But using a mouse requires a person to make small, exact movements with their hand, fingers, and thumb. By positioning, traveling, scrolling and clicking the mouse again and again, the same small muscles can become tired and overworked. It can lead to discomfort, pain, and even Workplace Musculoskeletal Disorders (WMSDs), such as Carpal Tunnel Syndrome.

Just as disconcerting is the placement of the mouse, usually to the top right or top left of the keyboard – the result of a lack of space and the fact that many workstations were built before the mouse became standard. The mouse is out of easy reach in this position and in order to use it, the person must reach their arm outward and forward and hold it there unsupported until their task is finished. This extended reach can cause problems for the neck, upper back, shoulder and mouse hand. CCOHS has a wealth of tips and solutions for both issues, available through the links below.

While researchers have not discovered what mouse design best helps prevent injuries from repetitive use, a battery-powered, cordless mouse is most recommended, because there is no cord to get in the way. Regardless, the mouse should fit the hand, be similarly shaped on both sides and offer buttons that respond to a light, but not too sensitive, touch. In addition, wrist rests should be avoided. Using a wrist-rest puts more pressure on the carpal tunnel in your wrist.

There are two inexpensive routes to solve the issue of mouse placement: Mouse platforms and shorter keyboards. When desk space is at a premium, mouse platforms put the mouse within easy reach. A mouse platform covers the numerical pad on the right side of the keyboard - which is rarely used in many office functions - and serves as a place for the mouse to sit. Because the mouse is on a platform, it is easier to avoid the tendency to wiggle it further and further away, which would increase the reach and cause muscle strain.

Shorter keyboards, usually without the numerical keyboard and arrows, allow the mouse to be placed closer in line with the shoulder and arm. The extra four inches gained with such a keyboard reduces sideways movements, making injury less likely.

Why isn't the most common placement of the computer mouse the best?

Since the computer mouse is a fairly new development, most computer workstations were built before it was in use. When the mouse came along, it was usually positioned in the only spot where there was room: the top right of the desk, beside the keyboard (Figure 1).

Figure 1

This was not the easiest place to reach, however. Having 'extra keys' to the right of the commonly-used letter and number keys (for example, arrow keys, insert, page down and the number pad) do not allow users to place the mouse more directly in line with their arm and shoulder. As the use of mice became more and more common, more and more people began to complain of discomfort, aches, and pains in the neck and shoulder area, and along the whole arm with which they used the mouse. Reaching your arm forwards beyond an "easy reach" zone can lead to these discomfort and even injury. (For more on this, please see the OSH Answers document "Computer Mouse: What Kind of Problems Can it Cause?").

Where is the right place for a computer mouse?

A typical computer workstation (Figure 1) does not have enough space to properly position a mouse, but a space must be made so that the workstation is safe and comfortable. One way to make this space is by using a mouse platform. Another way to make this space is by using a shorter keyboard (for example, one without a number pad).

How can a mouse platform help computer users?

When there is not enough space on the desk to position a mouse within easy reach, you can use a mouse platform. A mouse platform covers the numerical pad on the right side of the keyboard - which is rarely used in many office functions - and serves as a place for the mouse to sit. (Figure 2). The mouse is then closer to the person using it. As well, because the mouse is on a platform, you avoid the tendency to wiggle it further and further away, which would make you reach even further and cause muscle strain.

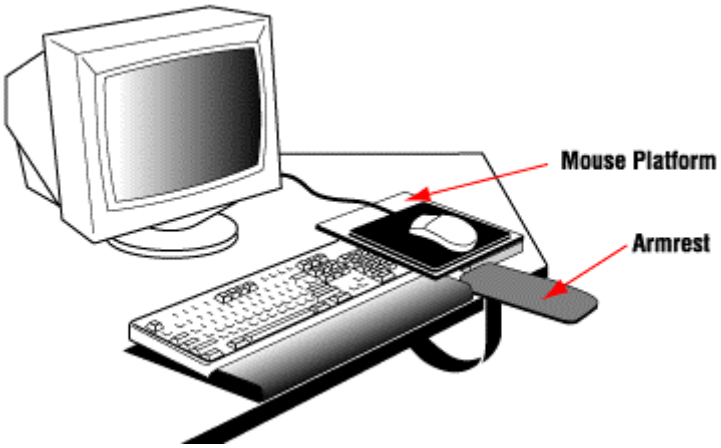

Figure 2

However, the height of the mouse platform puts your hand in a slightly unnatural position. To make using it more comfortable, you can use a forearm support. (Figure 3).

Figure 3

Advantages of a mouse platform:

- Reduces sideways and forward reaching.
- Reduces the overall area in which you use the mouse.

Disadvantages of a mouse platform:

- The platform raises the mouse a little above the keyboard. Using a slightly higher arm support with the platform can position your hand more naturally.

How can a shorter keyboard help computer users?

Figure 4

Computer keyboards come in many sizes. By using a shorter (14" long) keyboard instead of a regular (18" long) one, you will have 4 extra inches of space at the side of the keyboard where the mouse can be placed (Figure 4).

Advantages of a shorter keyboard:

- The extra 4 inches gained by using a shorter keyboard will make you have to reach sideways much less.
- Fewer sideways movements mean you will be more comfortable and less likely to get injured.

Disadvantages of a shorter keyboard:

- A shorter keyboard means you have to get used to a slightly different key arrangement. However, most people don't mind this as long as using the mouse becomes more comfortable.

Note: Whatever shape, size, or application of mouse you use, a battery-powered *cordless* mouse is highly recommended. It eliminates one of the most common problems with using a mouse: the cord getting stuck or in the way.

How do I select the right mouse?

There are so many different designs of computer mice available, yet researchers have not yet discovered what design best helps prevent injuries. Although employees should be allowed to try different models and see which suits their needs, we have some tips that may be helpful:

- A battery-powered cordless mouse is highly recommended, because there is no cord to get in the way.
- Shape:
    - Choose a mouse that fits your hand. Many people find the "teardrop" shape comfortable.

Figure 1

    - Choose a flat shaped mouse, which reduces wrist extension.
    - Choose a mouse that is shaped the same on both sides.
    - Avoid a curved mouse.
- Size:

- Choose a mouse that is large enough to support the natural curve of your hand.

A larger mouse that still fits in the palm of your hand helps you use your larger arm muscles rather than the smaller wrist muscles, which tire easily and are more likely to experience Workplace Musculoskeletal Disorders (WMSDs).

- Buttons:
  - Choose a mouse with buttons that respond to a light touch, so that you don't have to press too hard to make it work, but one that isn't so sensitive that you hardly have to press it to activate it.
  - Choose a mouse with buttons that neither cramps the fingers nor spreads them out too far apart.
  - Choose a mouse with a "drag lock" or "click lock" function.

How can I reduce the chance of getting sore, tired, or injured while using the computer mouse?

A well-designed workstation with a properly selected computer mouse helps prevent discomfort and injury. By following the suggestions below, which tell you the safest way to use the mouse, you can further prevent such problems.

- Don't squeeze the mouse. Hold it loosely in your hand with a relaxed grip. A tight grip will not help you position the pointer any better or faster.
- Keep your wrist straight. Your forearm, wrist, and fingers should all be in a straight line (Figure 2).

Figure 2

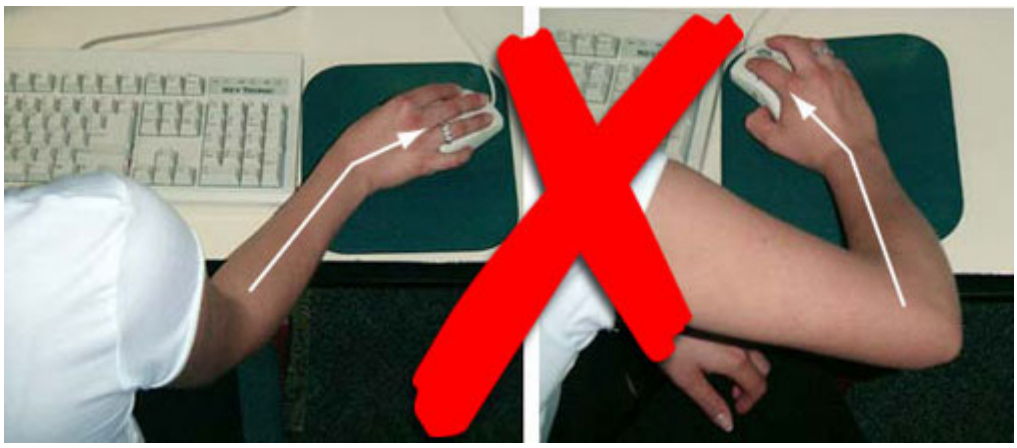

Figure 3

Figure 4

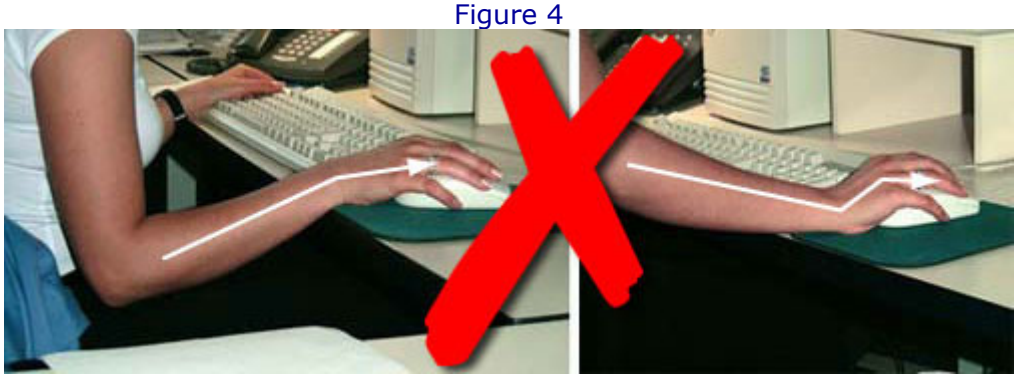

Figure 5

- Protect your wrist - do NOT use a wrist-rest. Using a wrist-rest puts more pressure on the carpal tunnel in your wrist, which can cause painful Carpal Tunnel Syndrome (CTS). Using a wrist-rest also restricts the flow of blood to and from your hand.
- Keep the mouse clean. If the mouse becomes jumpy or less sensitive, the problem may be a build-up of dust on the rollers.
- Alternate the hand using the mouse, if possible.
- Use the shortcut and function keys on the keyboard instead of the mouse whenever possible.