



ERGONOMIC STRATEGIES-COMPUTER KEYBOARDS

Problems Caused by Computer Keyboards

- Computer keyboards can increase carpal tunnel pressure whenever the hands deviate sufficiently from a neutral position, which can prevent the free flow of fluids into the palm of the hand.
 - Research has shown that sustained increases in carpal tunnel pressure of > 30 mm Hg disrupt blood flow and impair the nerves of the wrist and hand. Carpal tunnel pressure is typically ≥ 40 mm Hg when flexing or extending the wrists during typing tasks.
 - Maintaining this position for an extended period of time can lead to injury of arm and hand musculature as well as the tendons and nerves within the wrist and hand.
- In addition to increased carpal tunnel pressure, repetitiveness and exaggerated force application when using a keyboard are risk factors directly related to repetitive stress injury.
- The standard, flat design of a typical keyboard requires users to make unhealthy postural adaptations to conform to the keyboard, and when using a computer keyboard for > 5 hours, the likelihood of injury significantly increases.

Tips for Proper Keyboard Use

- Using a downward tilting keyboard tray (with no more than a 15° tilt):
 - significantly reduces wrist extension while typing and at rest
 - considerably improves both low back pain and shoulder pain
 - wrists and hands maintain a more neutral position $> 60\%$ of typing time
- Open or fixed keyboards are better ergonomically than standard keyboards.
 - Open keyboards (with keys that slope up at an angle from the keyboard base) cause significantly less twisting of the wrist when typing.
 - Fixed keyboards (with keys split down the middle and angled) decrease the amount of wrist motion from left to right and maintain the wrist in a more neutral position.
- Don't use a wrist rest!
 - Research has shown that using a wrist rest doubles the pressure inside the carpal tunnel
 - This is because the floor of the carpal tunnel is a more flexible ligament that transmits external pressures directly into the carpal tunnel.
- Keyboard keys should not stick or need excessive force to be operated.
- Longer horizontal distances between the keyboard and the edge of the desk keep the wrist in a more neutral position and reduce chronic injury.



QUESTIONS? Contact Rachel Neuman: raneuman@bu.edu or Karen Jacobs: kjacobs@bu.edu

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