Safe use of Laptop Computers

Items to consider in the safe use of laptop include; posture, keyboard, mouse, screen, and transporting the machine.

Posture

In compacting the laptop, the design may violate basic ergonomic design requirements in flexible positioning of external accessories. There may be a trade-off between poor neck/head posture and poor hand/wrist posture. If the laptop is raised to prevent neck stretching, the keyboard is then too high for the hands, increasing the risk of straining hands, arms, and shoulders.

Posture recommendations are affected by the amount of laptop computer use. Occasional users work on laptops for short periods of time whereas full-time users rely on the laptop as their main computer. Occasional users have a lower risk of problems than full-time users. All users should pay some attention to how they use their laptop, particularly full-time users who are likely to have more problems.

- **Occasional Users -** because the neck/head position is determined by the actions of large muscles, it would be better to concentrate on your wrist posture. Posture recommendations for occasional use are:
    - Find a chair that is comfortable and that you can sit back in.
    - Positioning your laptop in your lap for the most neutral wrist posture that you can achieve.
    - Angling the laptop screen so that you can see this with the least amount of neck deviation.

- **Full-time Users -** if you use your laptop as your main computer, posture recommendations are:
    - Position the laptop on your desk/work surface in front of you so that you can see the screen without bending your neck. This may require that you elevate the laptop off the desk surface using a stable support surface, such as a computer monitor pedestal.
    - Use a separate keyboard and mouse. You should be able to connect a keyboard and mouse directly to the back of the laptop or to a docking station.
    - Ensure a neutral wrist posture. (i.e. the tops of the hands in line with forearm).
    - Use the mouse on the same surface that supports the keyboard.
    - For more information see;
        - "How to use your visual display unit safely." A Department of Labour publication, November 1995 - aimed at employees. A concise computer users guide. Copies are available from the Health and Safety Office.

- "Approved Code of Practice for the use of visual display units" A Department of Labour publication aimed at employers. An extensive guide to good computer practice.

Keyboard and Mouse

The laptop keyboard should be as large as possible. However, if the laptop keyboard is still too small, a separate keyboard and pointing devices (mouse) are recommended. The keyboard and pointing devices are small on a laptop so require precise hand movements to operate them. This leads to the adoption of fixed postures with very limited hand movements. Over a period of time, there is the potential for muscles to become tired and stiff, which increases the likelihood of overuse injuries. Using a separate mouse and keyboard will allow more relaxed precision in locating the cursor on the screen.

Screen

Select as large a screen and keyboard as possible. Many laptops offer large screens (15" plus) and can work as desktop replacements (giving the viewing area of a 17" monitor). However, think about where you will most use your laptop to help you choose the best size. The larger the screen, the more difficult it will be to use the laptop in mobile locations (e.g. airplane, car, train). Selecting a smaller notebook and ultra portable laptop may give problems with small screen size and screen resolution. Smaller screens should be checked for clarity using test characters 'V' & 'U', 'B' & '8', '5' & 'S', and you need to check that you can easily use the input device to point to areas on the screen.

Transportation

If you are a mobile professional who will be frequently transporting your laptop, think about the weight of the laptop plus the required accessories (e.g. power supply, spare battery, external disk drive, zip drive, CD_RW etc.). Many lightweight portables can become as heavy as regular laptops when you add the weight of all the components together. If your laptop and components weigh 4-5kgs or more then consider using a wheeled carry-on bag that you can pull along. If you want a smaller bag and can comfortably carry your laptop consider a good shoulder bag design.

Other things to remember:

Micropauses, rest breaks, exercise

Micropauses need to be done frequently, as often as every 4-5 minutes for 5 seconds during the day. There is software available to remind you to take these, available from ITS. Rest breaks are important; smaller and more frequent breaks are more beneficial than longer and less frequent breaks. Exercise can assist with reducing muscular tension and maintaining strength and stamina.

Work Environment

Working in environments of where extremes of temperature, noise, or light occur increases the effort required to concentrate on laptop use. Likewise, extreme postures such as reaching, leaning and stooping need to be assessed, reduced or managed.

Early reporting of discomfort

The reporting of discomfort or injury will assist with the effective management of the injury and if prompt support for the return to work is required. The Massey forms are available through the health and safety web site. Please contact the Health and Safety Administrator if a workplace assessment is required or any related information is required.

Appendix 1: Risk factors with Laptops

Laptops have the advantage that you can work wherever and whenever you wish or need to. However, if the laptop is not set up correctly your body can often pay the price for this flexibility.

Time at the laptop needs to be managed. You need to be conscious that you give yourself adequate breaks and micropauses. This assists with keeping your wrists, arms, shoulders and neck as free of muscle tension as possible.

Some of the reasons the set up of a laptop is unhelpful to ergonomics are set out below:

- The keyboard and the screen are connected. If the keyboard position is correct for typing, then the head and neck are flexed forward. This posture causes stretching of the neck, upper back and shoulder structures, which leads to an increased possibility of pain in these areas.
- If the laptop is raised to prevent the neck stretching, the keyboard is then too high for the hands, increasing the risk of straining hands, arms, and shoulders.
- The keyboard mounted pointing devices are small so that fine movements are needed to operate them. This leads to the adoption of fixed postures with very limited hand movements. Over a long period of time, there is the potential for muscles to become tired and stiff, which increases the likelihood of overuse injuries.

Please note: If a laptop is to be used for document typing or other extended use, an external keyboard, monitor and mouse should be fitted, and set up for the operator using correct ergonomic principles.

If you require further information regarding the use, set up and equipment related to laptops, please contact your Regional Health and Safety Advisor or the Health and Safety Office.