

## **Set up for Life**

Ensuring that your computer workstations are correctly designed and that workers are given adequate training in usage are vital steps in improving office ergonomics. Les Hogg, FSIA, RSP (Aust), CPE, Manager, Health and Safety Unit, University of Canberra, explains.

Computers are magnificent tools for work and leisure. Collectively they can be referred to as screen-based equipment (SBE), a term that is mutually inclusive of desktops, laptops, keyboards, pointing devices and other accessories relating to computer use. But don't forget the human factor. People come in different heights, weights, shapes and strengths and have many different perceptions about what goes on in their environment. All of this is very natural, but what is not necessarily natural is the physical relationship between a person and the SBE layout. If the user is not aware of any problems, then injury may result.

The majority of injuries arising from SBE can be collectively termed occupational overuse syndrome (OOS), which is once referred to as repetitive strain injury (RSI), and it relates to musculoskeletal injury. Generally, the injury arises because of repetitive actions and the use of excessive force, with postural problems exacerbating the effects. The term "postural problem" is a loose term because it is not only dependent on the human form but also on external matters, such as chair, desk and SBE positioning, draughts due to air flow, glare and reflection from natural and artificial lighting, noise and other similar distractions, any of which may cause the user to adopt an inappropriate posture.

### **Setting up a workstation**

**Chair:** it is advisable to have an adjustable chair. Have a look for one with five Standards Australia ticks on the label. Adjust the seat pan until it is level (if it has tilt function) and raise or lower its height until it is at the user's popliteal height (the crease at the back of the knee). Next, adjust the backrest so that the back is at a comfortable angle and then adjust its height until you feel good lumbar support (at the back, opposite the belly button). Finetune your adjustments until the chair is in the most comfortable position.

Regarding arms on chairs, they are very useful in getting in and out of the area and very much the user's choice; however, the user must ensure that the arms do not impede the tasks in hand nor prevent good posture.

**Desk:** in the case of multi-users or job sharing, it is advantageous to have a totally adjustable surface desk. Its surface area will depend on the tasks that the user undertakes but visual requirements, and to a lesser extent work envelope, should indicate that it not be less than 900mm deep (where the screen is). If there is no choice but to have a fixed-height desk, then adjust the chair higher and use a footrest.

Fixed-height desks with drop-down keyboards are reasonably popular. However, some people have experienced problems with the knees striking the drop-down mechanism, with papers and cords disappearing among mechanisms and especially with the restriction on where keyboards and pointing devices are able to be placed.

**Keyboard:** the keyboard height should be at sitting elbow height (with the arms tucked in and vertical). The Keyboard should be placed parallel to the screen and about 75mm from the front edge of the desk.

When choosing a keyboard it may be worthwhile determining the tasks to be undertaken. Where it is possible, and when the number pad is seldom used, purchase a shortened keyboard without the number pad. The reasoning behind this is to keep the mouse as close to the end of the keyboard as is practicable, as reaching for the elusive mouse increases static load on shoulder and arm muscle groups.

Mouse: the mouse is one of the tools described as a pointing device. The mouse should fit comfortably in the hand and be lightly gripped. It should be kept close to the keyboard on the user's preferred side. Reaching for the mouse and/or using the mouse at another level (height) must be avoided.

Monitor: the monitor (or screen) height should be at or just below horizontal eye level and about 600mm distant for normally sighted people or those with corrected sight. A lot will depend on the type of screen and its resolution. Adjustable monitor arms may be necessary as problems associated with monitor height are related to static or awkward postures, such as neck extension if the monitor is too high, flexion if too low, or neck rotation if not directly in front of the screen. Dry eyes or visual strain are also reported.

Flat screens are becoming more popular. The advantages are that they eliminate or reduce the 50-cycle flicker that some users see, they use less power and they emit less heat. They are also more environmentally friendly for disposal purposes.

Laptops: regarding laptop machines, the combined laptop keyboard, pointing device and screen relationship exacerbates any incompatibilities with the human (body) segments. For example, if the keyboard is placed in an appropriate position for the hands then it is rarely possible that the optimum screen height and focal length can be met.

Conversely, if the screen can be positioned for the eyes and head position (and to a lesser degree the back), then the hands and arms are put at risk of injury.

Current literature indicates that laptop use should be restricted to no more than two hours per day and then be alternating tasks each 20 minutes. The most salient point to be made is that a laptop should never be used as a substitute for a desktop machine, unless it can be configured so that focal length and height and appropriate placement of a separate keyboard and mouse can be ensured. Alternatively, the keyboard of the laptop can be used with a separate monitor and mouse.

Footrests: footrests, if used, should be 450mm x 300mm and achieve an angle of about 15°. The seat pan height should be raised to ensure the new popliteal height is maintained.

Slope boards and document holders: these are useful for some people and should be kept at screen focal length and immediately either side of the screen, or between the screen and the keyboard.

Wrist rests: these are useful for some people, predominantly for non-touch typists who raise their wrists while keying. The reality is that they are for resting the palm of the hand during micro-pauses.

Pauses: research indicates that rest pauses, or alternating tasks with keying, mean doing something else for around five minutes each 30 minutes. Pointing the hands towards the floor and gently shaking or rotating the wrists are useful exercises during pauses or as the hands tire.