

Health & Safety Guidelines for Screen Based Equipment Workstations

Introduction

The University is committed to continuously improving the management and standards of occupational health, safety and wellbeing of staff. This commitment extends to taking all reasonably practicable steps to prevent injury or illness as the result of using screen based equipment (SBE).

Workstation Design

The principle of good workplace design is to ensure the furniture suits the person not to fit the person to the furniture. The University will aim to provide suitable adjustable furniture to match the needs of the user i.e. a range of body shapes and sizes. If the workstation is not properly adjusted or does not suit the user poor posture may result in discomfort, fatigue, significant loss of productivity and injury.

Workstation Layout

The layout of the workstation will allow easy access to frequently used items and equipment to avoid reaching, twisting and bending. Frequently used items like keyboard, folders, files stationery items should be within the distance of the shoulder to the wrist. Less frequently used items such as the telephone and reference material should be placed within the extended arm reach.

Shelves with heavy folders and reference material should not be located above the monitor. File cabinets and drawer units should be placed so the user is required to alight from the chair rather than twist, bend and reach from the seated position. Where the SBE tasks involve counter work the workstation should be set up to allow sitting and standing.

Work Posture

Good work posture will largely depend on the furniture and equipment available however the general principles of good posture will reduce fatigue, discomfort and injury and improved productivity.

An adjustable workstation is the key to accommodating a large range of people and maintaining comfortable posture for most users. An adjustable workstation and chair will also allow frequent change in position that will minimise fatigue.

The aim of a comfortable posture for SBE users include:

- the feet are flat on the floor or supported by a foot rest,
- the thigh should be parallel to the floor surface,
- the front edge of the chair should not cause pressure on the underside of the thigh i.e. the leg should not dangle over the edge of the chair,
- the shoulders are relaxed with the upper arms and elbows close to the body and unconstrained by the arms of the chair,
- the forearms are horizontal with the wrist straight when on the keyboard,
- the back is upright or slightly reclined and supported by a medium or high back backrest, and
- the head is slightly inclined forward and relaxed.

Job Design

An important aspect of providing and maintaining health and safety of SBE users is the structure of the tasks to be undertaken. Good job design will balance the personal, social and physical needs of the person with that of the organization.

Three important aspects of good job design are variety, autonomy and feedback. Variety in the tasks performed can improve performance, satisfaction and motivation. SBE users who have a variety of tasks also experience a reduced incidence of Occupational Overuse Syndrome. Daily work tasks should be organised to take advantage of changes in posture and the use of different muscle groups. However where a variety of tasks are not possible, breaks must be taken to relieve static muscle load through 'stretch and relax' exercises.

The workload of individuals should be monitored to avoid the feeling of being 'swamped' during peak periods. Long term planning and allocation of resources will assist in managing changes in workloads during peak periods. Appropriate management of workloads will also recognise that a higher rate of injury occurs during the first year of employment and with mature staff members prior to retirement. Efforts should also be made to accommodate periods of adjustments for staff members returning from absence or following injury or illness.

As with any task typing is a learnt skill. Just as training is provided to reduce the incidence of injury in other job activities so to training in touch-typing should be encouraged. An unskilled typist will use the 'hunt and peak' method often using one or two fingers and a clenched hand. The typist will adopt a tense posture particularly of the neck as they constantly alternate between looking at the keyboard and the screen. In addition to a relaxed posture, leaning to touch type will improve speed and reduce error and repeat rate.

Equipment

Desks

Consider the size of the user and the tasks to be performed when selecting a desk design. Adequate width and depth of the desktop allows for the correct posture at the keyboard. Sufficient space must be provided for equipment, and handling documents, files and text material. The purchase of a height adjustable desk should be given priority where a fixed desk is currently used.

Important features to remember when purchasing new desks:

- Height adjustable desks only should be ordered,
- the desk top should be 25-33mm thick, and be a minimum of 1500 x 900mm for standard desks, and 1800 x 1800 x 750mm for corner desks,
- the desk surface should be light in colour with a matt finish and rounded edges,
- cable management trays should be considered,
- modesty panels should be included where a desk does not face a wall, or is likely to be relocated,
- adequate leg space will provide a minimum depth of 550mm and width of 800mm,
- corner desks should be finished with a 45° splay corner, rather than a squared corner and keyboard sleeve, and measure 1800 x 1800 x 750mm.

Fixed desks and fixed desks with drop down keyboard platforms are not recommended. The platform mechanisms can restrict leg movement and can cause injury as the leg strikes the mechanisms when the user turns to alight from the chair. In addition the platform usually does not accommodate the mouse thus the mouse is at a higher level, leading to shoulder discomfort or injury.

For standing height benches such as laboratory benches or reception counters, an adjustable height is preferred to suit workers of different heights. In most offices, having a higher work area is often useful to provide safe and efficient working postures for layout, sorting and collating of documents.

Australian Standard 3590.2 – 1990 states:

- Fixed height for standing work tables should be approximately 950mm,
- Adjustable height for standing work tables should be adjustable between 900 and 1100mm.

Chairs

A well-designed chair that is easily adjusted for frequent change in posture is essential. Important aspects to consider when purchasing new chairs include:

- Stability (a five star base),
- seat and backrest height adjustment,
- independent tilt adjustment of the seat and backrest,
- Freely moving casters on carpet (glides on linoleum),
- A height range that suits the person,
- Workers of large stature require a chair with a longer seat base,
- Woven fabric upholstery (except for chemical and biological laboratories where vinyl is required),
- A padded backrest contoured to fit and support the small of the back, whilst not impeding keying posture,
- Height adjustable short 'T' pad arms or arms that do not restrict movement close to the keyboard are recommended for most users who alight from the chair for other tasks frequently during the day,
- A chair without arms is recommended for users who predominantly perform keyboard tasks, and
- The chair should have a 'waterfall' front edge that reduces the pressure on the under part of the thighs, thus reducing restriction of circulation to the lower legs.

Monitors

To decrease static load on the neck muscles the top of the monitor screen should be level with the eye. Adjustable monitor arms and monitor risers enable optimum screen placement. The plane of the screen should be approximately at right angles to the user.

Individual's focal length will vary however it is important that appropriate focal length is achieved. However as a guide a distance of 600mm would be acceptable to most people. Persons using multifocal glasses may find the screen needs to be closer to achieve a balance between relaxed head posture and viewing through the correct part of the lens. In this instance assistance may be sought from Health & Safety Unit Staff to identify the correct screen position.

There is no scientifically acceptable evidence that use of SBE damages the eyes or eyesight. However, any staff member engaged in a visual task for long periods may experience visual fatigue. This is a natural consequence of using the eye muscles continuously to move the eyeballs and focus on the image.

Visual fatigue may be reduced by:

- Adjusting the screen contrast and brightness,
- Changing display settings to large icons,
- View and work documents in 100% page view or greater,
- Report flickering or other screen problems promptly,
- Ensure you do not work in areas with low light levels,
- Avoid working with excess glare behind the screen (unshielded window),
- Return documents of poor legibility (untidy or small handwriting)
- Avoid long periods of continual keying without a break,
- Ensure your screen is frequently cleaned, and
- Ensure existing visual defects are examined and corrected.

Keyboards

The keyboard should be placed 60-70mm from the front edge of the desk and parallel to the screen. The wrist should be straight with the elbow flexed at 90° and the forearms level with work height.

There are various keyboard designs, including compact, cordless, "Internet", "ergonomic" and split. Contact the Health and Safety Unit prior to purchase as these may need to be trialled to check whether the design matches the hand size, finger reach and keying style of the user.

The keyboard should be as thin as possible with the height at the home row of keys no greater than 30mm and a slope no steeper than 12°.

The keys should provide feedback (sound or touch) to the operator, and should have a matt finish. The connecting cable should stretch at least 300mm but preferably be 1 metre in length.

Over stretching the fingers to reach shift and function keys should be avoided. Micro pauses in between program operations are important eg resting the hands in the lap whilst the document saves. Touch typing skills and keyboard short cuts are advantageous as they cut down on keystrokes and mouse use.

Mouse

There are a large variety of mouse and trackballs available. The problems associated with work without breaks or repetitive or intensive mouse work will not be solved by mouse design alone however some hand, arm and shoulder discomfort can be eased by a change in mouse.

Since mouse problems predominately arise from postural and repetitive actions ensure the hand is in a relaxed position with a straight wrist and frequent breaks or micro pauses are taken.

To avoid over reaching the mouse should be placed directly beside the end of the keyboard on a small clean mouse mat.

Easy alteration between left and right hands should be considered if extensive mouse orientated software programs are used. To alternate muscle load and postures a different mouse design can be used at home to that used at work eg a standard mouse at work and a trackball at home.

A concerted effort should be made to learn keyboard shortcuts, relax the grip on the mouse and release the mouse when not in use. A mouse with minimal activation force for button operation is desirable.

Scroll wheels can reduce prolonged holding down of the mouse buttons e.g. during web searches, however care should be taken that the wheel use does not cause extra finger strain.

Footstools

A footrest should be used for persons of short stature or at fixed desks to raise the knee height to keep the thigh parallel to the floor. The use of a footstool in these circumstances will prevent pressure of the back of the thigh that may impede good circulation. A footrest should be stable, adjustable and large enough to accommodate changes in the position of the feet. A footrest can be obtained through the University Stationery Stores.

Document Holders

A document holder should be used when a document is referred to during keying to reduce prolonged or repeated turning and flexing of the head and neck. Document holders should be positioned beside the screen or between the keyboard and the screen. Desk clamp-on document holders can be obtained through the University Stationery Stores.

Slope Boards

Continuous reading or writing can cause discomfort as the head is flexed forward for prolonged periods. An adjustable desk may be raised during these tasks alternatively a slope board may be used to elevate the document, files and books at an angle to the desk. A slope board may also be used between the screen and the keyboard when files are referred to during keyboard work.

Wrist Rests

A wrist rest provides a soft padded cushion in front of the keyboard and/or mouse. A wrist rest is a useful cushion for users who rest the heel of the hands on the desk in between keyboard and mouse actions (predominantly the non-touch typer). Wrist rests are not designed to be used during typing rather during micro pauses. The use of a wrist rest is a personal choice and may be obtained through the University Stationery Stores.

Laptops

Laptops are of great benefit where portability is required e.g. field trips and conferences, however prolonged use will cause visual fatigue and physical discomfort. Most laptops have a liquid crystal display which may be more difficult to read than with standard SBE. In addition the screen is too low and distance to the user is too close. The small keyboards of most Laptops causes the user to hunch over the keyboard and prolonged fine finger movement is required when using the trackball or scroll functions. Therefore Laptops are not recommended for the work or home office unless connected to a standard keyboard mouse and screen.

Telephones

Telephones should be located on the non-dominant side of the desk and within easy reach. The user should not have to over extend the arm or twist the body to use the phone. An Accodata telephone platform clamps on the side of the desk elevating the phone off the desk whilst placing it within easy reach. The telephone platform can be obtained through the University Stationery Stores.

The telephone should not be cradled between the shoulder and ear when in use. Staff members who perform a large volume of telephone work may benefit from the use of a telephone headset.

Work Environment

Lighting, Glare & Reflection

Careful positioning of SBE taking into account natural and artificial light will reduce visual fatigue of the user. Monitors should be at 90° to a window, not directly behind or facing the screen. Walls, ceilings and shelving should have a matt finish. Windows should be curtained and overhead lighting should be fitted with clean glare diffusers.

SBE users should be able to change focal length by viewing the outside environment or a picture with depth when the desk backs to a wall. To reduce reflection the screen should be flat to the user or tilted very slightly downwards. Negative contrast on the screen i.e. dark characters on a light background, will also assist in reducing reflectance.

Efforts should be made to reduce glare and reflection rather than the fitting of monitor glare filters. However where monitor glare filters are used they should be cleaned frequently and the brilliance and contrast of the screen will need to be adjusted to compensate for the filter.

The Health and Safety Unit or the Facilities and Services Unit can provide advise on task specific interior lighting levels in accordance with the Australian Standard AS 1680.2.2 – 1994 Interior Lighting.

Noise

Although general office noise is well below that which may affect hearing a quiet office reduces fatigue and improves productivity. Carpets, wall hangings and curtains will assist in reducing noise, whilst hard surfaces such as glass walls and whiteboards will reflect noise. The computer hard drive should not hum or emit sounds likely to disturb the user or other staff in the area. Older printers that emit distracting noise levels may require an acoustic hood. Open plan work areas will benefit from soft furnishing barriers and a 'quite office' staff agreement.

Climate

The University has developed policy guidelines on indoor thermal comfort. This document can be viewed at <http://www.canberra.edu.au/hr/health-safety/management/procedures>

Difficulties with thermal comfort should be reported to the supervisor and the Facilities and Services Unit.

Radiation

Radiation emissions from computer monitors used in Australia are well below recommended international exposure limits, and for non-ionising radiation below that emitted by some household electrical appliances.

References

The National Code of Practice for the Prevention of Occupational Overuse Syndrome

Guidance Note for the Prevention of Occupational Overuse Syndrome in Keyboard Employment, Worksafe Australia

Australian Standard 3590, 1990

Further Information

Health & Safety Unit, Building 1 South, Room 1C11