A Guide to Work with Computers

**Occupational Safety and Health Branch
Labour Department**

A Guide to Work
with Computers

Contents

Introduction

With the rapid advancement of information technology, use of computers is already part of many people's daily life. Those engaged in electronic information and computer-related professionals have to use computers for long periods. Their regular and repetitive actions in operating their computers may cause repetitive strain injuries and visual fatigue if they have not adopted a proper working posture.

To avoid any involved health risk, employers and employees have to consider their conditions and environmental factors such as lighting condition, computer workstation design and working posture in the office.

Good communication and cooperation between employers and employees is required in order to improve working conditions in relation to safety and health at work. Any occupational health risks arising from the use of computers will hence be reduced and work efficiency will be increased as a result. This guide offers advice, in question and answer format, on some commonly encountered safety and health problems in relation to computer work with a view to assisting employers and employees to improve their workplace conditions.

1. Terms

Q1   What is the difference between a piece of Display Screen Equipment (DSE), a visual display unit (VDU), a visual display terminal (VDT) and a computer monitor?

Ans.   Basically all these items refer to the same thing, i.e. a display screen composing part of a computer and showing characters, numbers or graphics.

2. Workstation design

Q2.1 In selecting office furniture for a computer workstation, what factors should be considered?

Ans.   The main components of a computer workstation are the desk or display support, support for keyboard and mouse or other input device and the chair. A workstation should permit the users to adopt a healthy, comfortable posture without overloading the musculo-skeletal system. To achieve this aim, the furniture should be adjustable as far as practicable. Other requirements include sufficient space on work surfaces for documents and sufficient leg room.
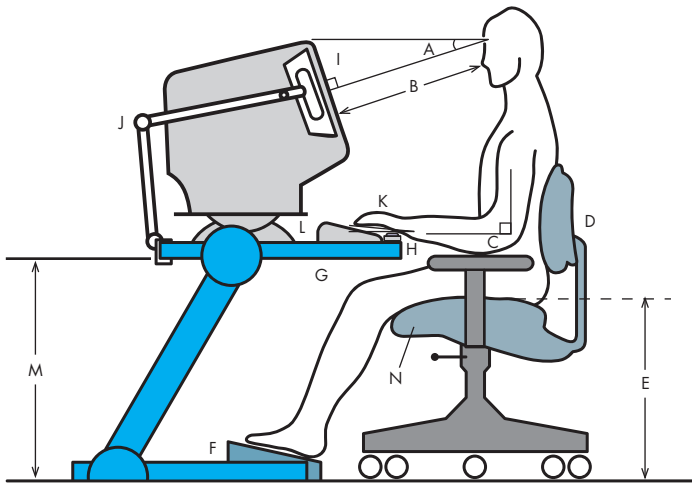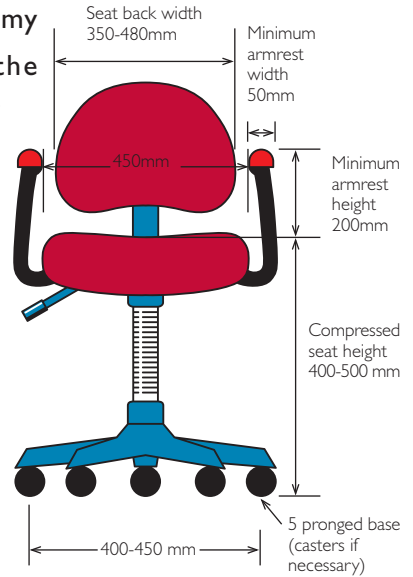
A   Comfortable viewing angle, e.g. 15° - 20°

B   Comfortable viewing distance,
    e.g. 350 - 600mm for text of normal font size

C   Forearm and arm at about right angle

D   Adjustable back rest

E   Adjustable seat height

F   Firm foot rest if required

G   Adequate knee clearance

H   Wrist rest if required

I   Screen at right angle to line of sight

J   Adjustable document holder

K   Wrist kept straight or at most slightly inclined

L   Screen support adjustable for rotation and tilting

M   Adjustable table height preferable

N   Rounded or scrolled edge seat pad

Recommended computer workstation design and working posture

Q2.2 I want to replace the old chairs for my computer operators. What are the essential features of a suitable chair?

Ans.   An office chair should have:

- a stable base (a five-pronged base is recommended) & smooth casters if necessary
- adjustable seat height, from 400 to 500 millimeters
- a slightly concave seatpan made with a dense foam and a breathable covering
- swivel seat
- round or "waterfall" front edge
- adjustable backrest, both in height and tilt
- a pair of armrest with adjustable height if necessary

Seat back width
350-480mm

Minimum armrest width 50mm

450mm

Minimum armrest height 200mm

Compressed seat height 400-500 mm

400-450 mm

5 pronged base (casters if necessary)

Q2.3 I know that it would cause stress to the eyes if the viewing distance is too close. What is the recommended viewing distance?

Ans.   The monitor should be placed at a level where its topmost line of display is at about or just below the operator's eye level. The viewing distance between the operator's eyes and the screen should be around 350 to 600 millimeters for reading text of normal font size.

Q2.4 Should I use a document holder?

Ans.   If frequent viewing of document for data entry is required, a document holder should be used. The document holder should be stable and adjustable for height, distance and angle of viewing. It can be used on either side of the monitor, thus minimizing the need for the operator to move the head to and fro and to refocus his eyes in order to read the screen and the document.
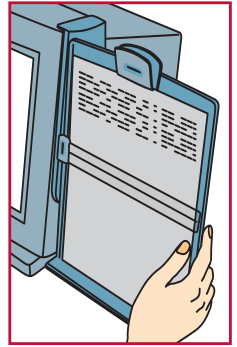

Q2.5 Should I use a foot rest for my computer work?

Ans.   A footrest is recommended if an operator cannot rest his feet flatly on the floor even if the chair height has been properly adjusted. Small sized people usually need foot rest support. The footrest should be stable, non-slippery, incline and height adjustable, and should not restrict leg movement.

## Q2.6 Should I use a wrist rest while keying in data?

Ans.   If intensive keyboard operation has to be performed, a wrist rest may be used if the user finds it more comfortable. The primary function of a wrist rest is to keep the wrist straight during keyboard use and provide padding. When a proper wrist rest is used correctly, it can reduce the risk of repetitive strain injuries. However, while keying, remember to keep the hands above the keyboard and move the whole hand to reach side keys, rather than resting the wrist on the rest and bending the wrist sideways. The wrists should only be resting on the wrist rest during pausing.
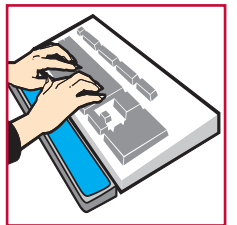
Q2.7 How should I select a suitable wrist rest?

Ans. In selecting a wrist rest, the following criteria should be considered:

a. thickness of the rest should be about the same as the front of the keyboard;

b. the rest should be wide enough (front to back) to support the wrist;

c. wrist rests should not have sharp edges; and

d. made of breathable materials.
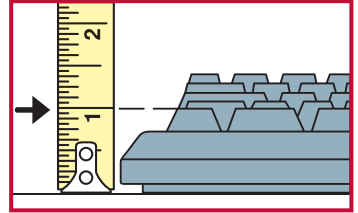
Measure the distance from the top of the space bar to the tabletop. Choose the wrist rest to match that dimension.

3. Equipment

Q3.1 Some anti-glare screen suppliers claim that their anti-glare screens can reduce radiation and prevent myopia. Is this true?

Ans. Anti-glare screens improve screen visibility by reducing bright spots or washout caused by ambient light on monitor screens. Thus, these screens may be used to reduce screen reflections. Radiation emitted by a computer monitor is well below the limits set by international bodies for limiting health risks. It is therefore not necessary to add any filter to reduce the emission. In any case, the anti-glare screens are not designed for effective screening of radiation.

Currently, there is no scientific evidence that prolonged computer work will cause permanent damage to the eyes or eyesight. However, prolonged use of computer can lead to eye strain. The best preventive measure to reduce eye strain is to view distant objects on a regular basis and do eye exercises.

Q3.2 My routine duties include answering phone call while operating the computer. Could this be related to my neck sores?

Ans. Muscles of the neck may be sore if the phone receiver is cradled between the head and shoulder for a long time. When a computer and a telephone have to be used at the same time, it is recommended for the operator to use a headset.
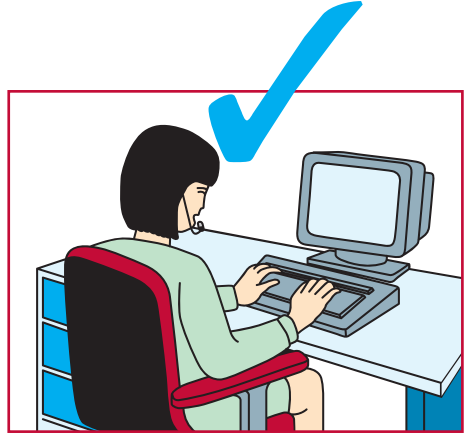

Q3.3 I have to use a notebook all the time and I have developed some aches and pains in my fingers and hands. What can I do ?

Ans. The small size of the keyboard and the pointing device of a notebook computer lead to cramped postures of fingers and hands, thus causing early fatigue if the equipment is used for a prolonged period. It is recommended that a detachable keyboard and mouse be used if a notebook has to be used for long hours.

Q3.4 I have heard that a V-shaped keyboard is available. Will it do me any good?

Ans. When operating a traditional keyboard, some computer users may have to bend their wrists to the side to type. This posture is unnatural and may strain the wrists. A V-shaped
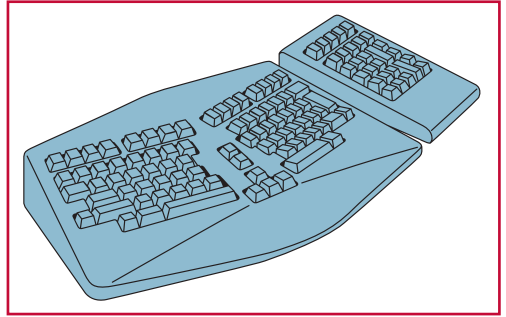

keyboard may help a user to position his hands naturally while keying in data. If a user is working well with a traditional keyboard, he/she may not need to change to this new type. If one wants to change to a new design, an evaluation should be made to ensure that the users can work comfortably with the new keyboard.

4. Environment

Q4.1 There are bright spots on my screen and it is difficult to see the characters clearly. What should I do to reduce glare from the screen?

Ans. One of the main causes of eye complaint made by a computer operator is glare. Glare can be reduced by:

a) changing the position of any light sources causing the glare;

b) fitting the light sources with appropriate diffusers or lampshade;

c) providing curtains or blinds to windows;

d) ensuring that the screen is perpendicular to the light sources or windows;

e) using anti-glare screen only if the glare cannot be effectively eliminated by other means.
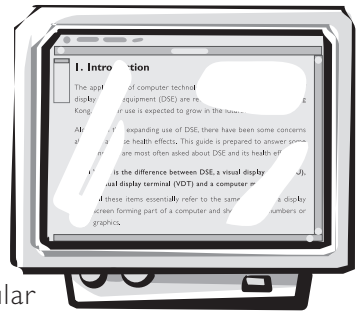
Q4.2 My office lighting is too bright. What is the recommended lighting level for a computer room ?

Ans. Lighting levels ranging from 300 to 500 lux are appropriate for most computer desk work. Generally, the maximum lighting level should not exceed 750 lux. Excessive lighting levels have a "masking" effect and make it difficult for the operator to see the display on the screen.
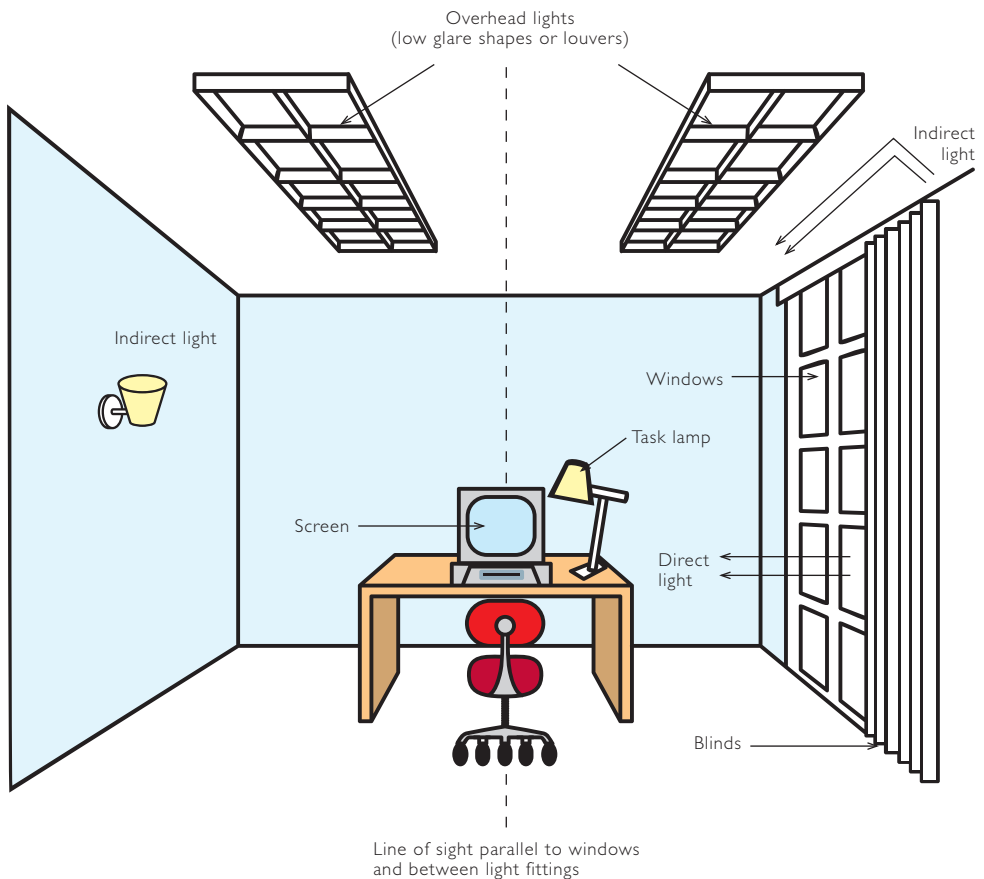
*Recommended lighting arrangement for a computer workstation*

5. Working posture

Q5.1 I feel aches and pains in my arms and wrists after work. Could this be related to my working posture?

Ans. If maintained for a prolonged period of time, improper working posture may result in pains and aches in the back, arms, neck and wrists. While operating a computer, an operator should adopt a natural and relaxed posture. Please refer to the diagram on page 3 for a recommended working posture. However, even if the posture is proper, keeping it for a long time is also stressful. Therefore, remember to change the posture frequently or have a task break, e.g. doing alternative work.

Q5.2 Would improper mousing cause hand injury? What is the proper way of using a mouse?

Ans. An operator should adopt the following practices in mousing:
   a) avoid squeezing the mouse or pressing the mouse buttons with excessive force;
   b) avoid bending the wrist sideways and/or forward; and
   c) perform mousing and the keyboard operation at the same height.
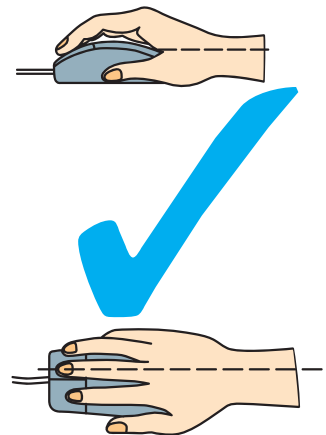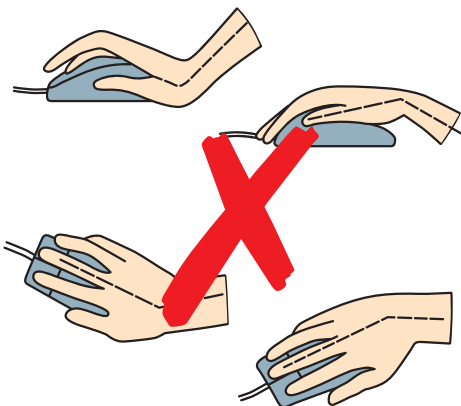
6. Personal factors

Q6.1 I feel tired and have symptoms like headache and burning eyes after working on the computer for a few hours. What should I do to take care of my eyes?

Ans. Computer users may experience visual fatigue and discomfort after prolonged computer work. Symptoms include burning eyes, blurred vision and headache. To alleviate eyestrain, a short task break (5 - 15 minutes) taken after 1 - 2 hours of continuous computer work is recommended. During the task break, the computer user should do alternative work, like filing, photocopying, etc., or get up, stretch and view distant objects. Proper eye glasses should be used to correct vision where necessary.

Q6.2 I wear bifocal lens. Can I use it in my computer work?

Ans. Yes. A computer user who wears bifocals tends to tilt the head back to view the monitor through the lower close-vision part of the glasses. The top of the screen should be at 50 to 100 millimeters below eye level. If you still cannot work comfortably with bifocals, you may need another type of spectacles, e.g. a pair of monofocal glasses.

Q6.3 I am pregnant. I am concerned about the health effects of radiation from the monitor. Can I continue my work as a computer operator?

Ans. The emission of radiation from a monitor is generally found to be substantially below the limits set by international bodies for limiting risk to human health. There is no conclusive scientific evidence to indicate any adverse health effect to the operator or the foetus.

Q6.4 Can computer work trigger epileptic fits?

Ans.   Most people with epilepsy are completely unaffected by computer work. Even people suffering from the very rare photosensitive epilepsy, who are susceptible to flickering lights and strip patterns, also find computer work not affecting them in normal cases.
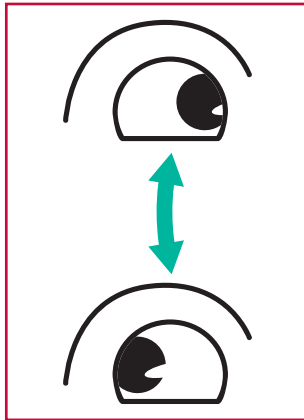
7. Exercises

Q7.1 I have to use computer for a long time everyday. Would you recommend some simple physical exercises to relax myself during a break?

Ans.   During a break, you may follow the following recommended exercises to relax yourself. This can prevent early fatigue and musculo-skeletal disorders. You may repeat each exercise for several times. However, should you really have a health complaint, you should consult a physician.

Exercises for the eyes
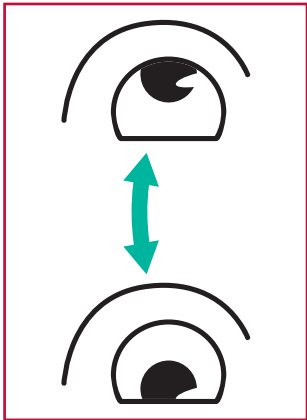
(1) Keep the body and the head upright. Turn the eyes up to look at the ceiling, then turn down to look at the floor.
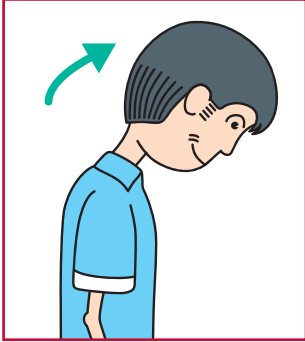
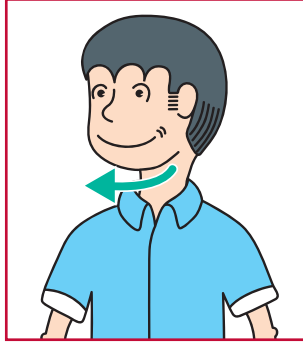(2) Turn the eyes left and right slowly to look at objects on the two sides.
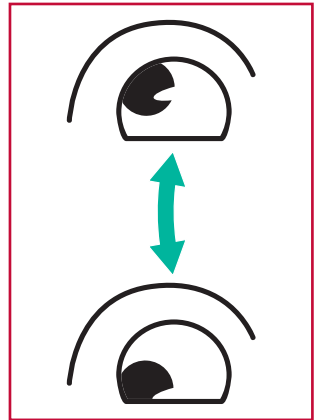
(3) Turn the eyes to look at objects at the right upper direction and then the right lower direction. Repeat for the left upper and left lower directions.
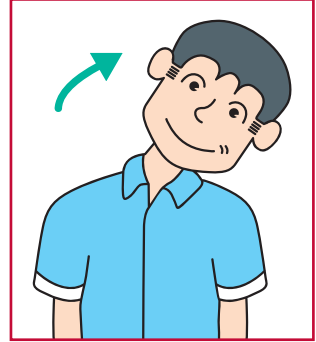
Exercises for the neck

- Keep the arms relaxed at your side.
- Bend your head forward slightly to stretch the neck.
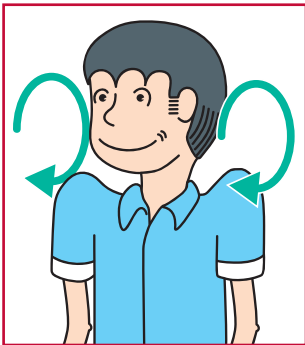- Hold for 5 seconds.

- Keep the arms relaxed at your side.
- Turn the head to one side and hold for 5 seconds.
- Repeat for the other side.

- Keep the arms relaxed at your side.
- Swing the head to the left and hold for 5 seconds.
- Repeat for the other side.
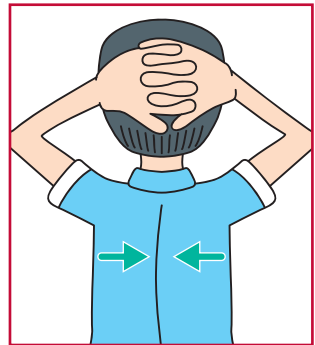
Exercises for the shoulders

- Raise the shoulders and rotate backward slowly. Repeat 10 times.

Exercises for the upper limbs

- Cross the fingers and lift both arms up, flip the palms upwards and stretch the upper limbs.
- Hold for 10 - 15 seconds.
- Then relax the shoulders.
- Breathe deeply during the exercise.

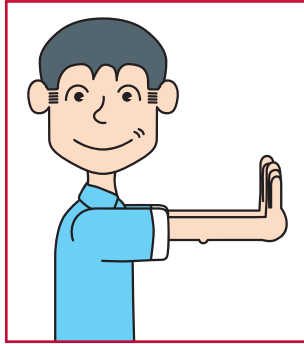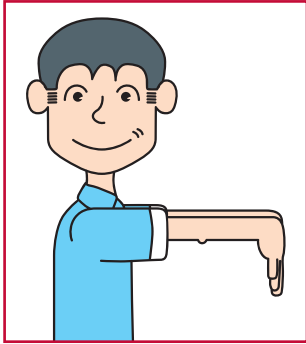## Exercises for the shoulders and the upper back

- Sit upright, hold your hands behind your head and stretch your elbows outwards.
- Force the scapulas inwards and feel the pressure at the upper back and the scapulas.
- Hold for 5 seconds and relax.

Exercises for the hands
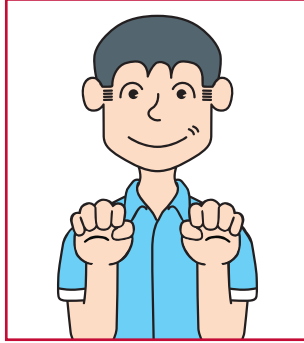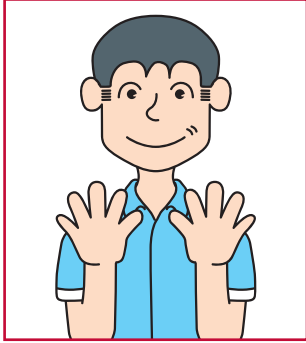
(1) Stretch the fingers and hold for 10 seconds, then relax.

(2) Lift your arms to chest level with the palms facing downwards. Slowly turn the wrists upwards and hold for ten seconds. Slowly turn the wrists downwards and hold for ten seconds.

8. Enquiries

If you wish to enquire about this guide or require advice on occupational health and hygiene issues, please contact the Occupational Safety and Health Branch of the Labour Department through:

Address :   15th floor, Harbour Building, 38 Pier Road, Central, Hong Kong.

Telephone : 2852 4041

Facsimile :   2581 2049

E-mail Address: enquiry@labour.gov.hk

Information on the services provided by the Occupational Safety and Health Council can be obtainted through its hotline 2739 9000 and website http://www.oshc.org.hk.

9. Complaints

If you have any complaints about unsafe workplaces and practices, please call the Labour Department's Occupational Safety and Health Complaint Hotline on 2542 2172. All complaints will be treated in the strictest confidence.