

## Computer Screens and Vision

One of the most significant changes to modern office procedures have been the introduction of the computer; a change that has brought important benefits to business and industry. As with many success stories, there have been some unexpected problems. Eyestrain and vision problems are among the most frequent complaints.

### Visual demands on computer operators.

Computer work involves concentration on a task usually 50 cm or less away. To see clearly at these distances requires an unconscious effort. There are 18 muscles working in unison to direct eye positioning and focusing. Each one of these muscles needs to work to extreme accuracy to align vision and allow gaze to fix on the screen, and track and follow across the screen. Most muscle fibres have a 1:10 nerve fibre to muscle fibre ratio, but those controlling the positioning of the eyes have a 1:1 ratio. When there is long term focus required at a set distance any inaccuracy in eye teaming or focussing is likely to surface as eyestrain, headaches and fatigue. When concentrating we blink less, leading to frequent dry eye problems for computer operators.

### Common complaints of computer operators.

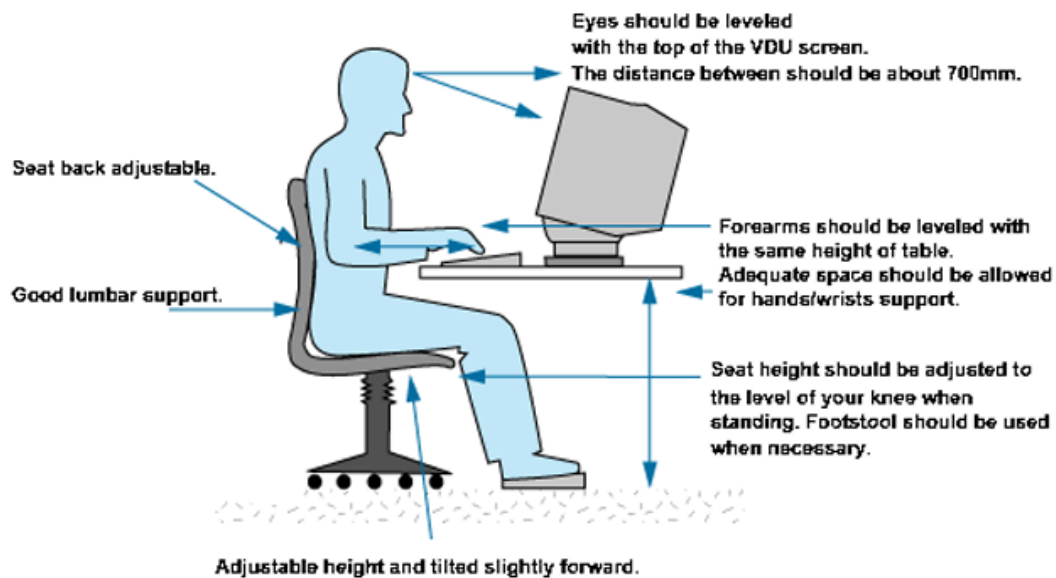
There are many common complaints related to computer use. These include: headaches, blurred vision (for either near or far viewing distances), itching, burning, eye fatigue, flickering sensations, double vision, slow refocusing, frequently losing place, and distance blur after prolonged computer use. These complaints are symptoms of what is now called digital eye strain.



## Furniture, posture, and position.

The use of appropriate furniture and proper positioning of hard copy can help prevent computer operator discomfort and reduce the frequency of work-related problems experienced computer operators.

- Adjustable chairs allow the user to set the chair for the most comfortable height and back support.
- The top of the computer screen usually should be 10 degrees (and the centre of the screen 20 degrees) below the user's straight-ahead seeing position. The appropriate distance from the viewer's eyes to the screen should be approximately 35 to 50 cm.
- Reference material should be placed as close as possible to the computer screen. This avoids large head and eye movements, which are tiring.
- Where possible, reference material and the computer should be placed the same distance away from the eyes. This reduces the need for frequent changes of focus that can contribute to visual discomfort caused by unconscious effort.



## Tips on lighting and glare control for computers

Lighting needs vary with individuals, with the nature of the task at hand and office layout. The below are some tips to remove glare from your work environment.

- There should be a high degree of contrast between the characters on the screen and the background.

- Reflected glare on computer screens should be minimised by positioning screens so that windows and other sources of bright light are neither behind the operator nor behind the screen. Operators should not sit facing an unshaded window or other source of bright light. Curtains, blinds and other means of shading should be used to reduce glare. A small hood can be attached to the screen to shield it from excessive overhead light.
- Special monitor shields or anti-glare screen filters are available that can be fastened to the front of the screen to eliminate troublesome glare and reflection.
- Localised lighting sources such as flexible lamps can be used for other deskwork. These should be shielded to avoid glare on the work surface or computer screen and to prevent sharp contrasts.
- Avoid white or coloured clothing if it causes a reflection on the screen.



## Poor vision and computer use are a bad combination.

Computer work imposes greater visual demands than traditional office work. It is likely that previously unnoticed vision disorders are one of the most common reasons for vision-related complaints by computer operators. Optometrists Association Australia recommends that staff members have their eyes examined thoroughly before they begin work with screenbased equipment and then on a regular basis. The examining optometrist should be advised that the person is, or will be, a computer operator, and told of any specific visual problems that the person has experienced. The distance and angle of the computer screen at which the operator is working should be described. Proper optometric care can solve most vision problems.

## Taking rest breaks can reduce fatigue.

Rest breaks are important because computer operation often requires intense concentration. Work with screen-based equipment should be interspersed with other tasks. Rest breaks may need to be scheduled into a work routine. Glancing away from the screen for a second or two every few minutes will make work with computers more comfortable.



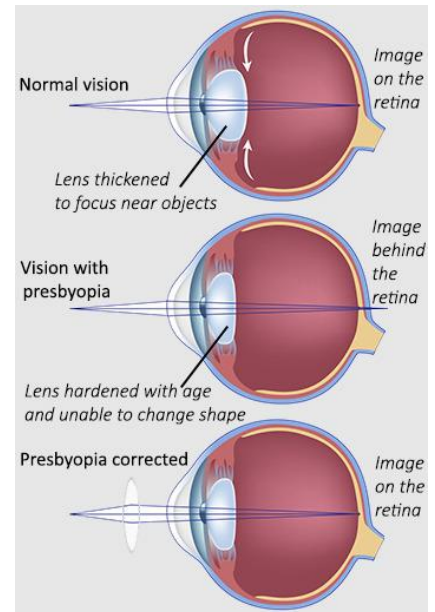
## Vision problems that may affect computer work.

Longsighted people see distant objects more clearly than they see close objects. A mildly longsighted person who is generally able to perform normal seeing tasks such as driving or reading without prescription spectacles may require them to overcome blurred vision or visual discomfort when working at a computer.

Presbyopia is a vision condition that is part of the natural ageing process and usually is first noticed in the mid 40s. Presbyopia reduces a person's ability to focus clearly on close work. Reading glasses for use while operating a computer may be required. If bifocal, trifocal or progressive glasses are to be prescribed, information such as the measurement of the distance from the operator's eyes to the screen must be given to the optometrist.

Astigmatism is a common vision disorder that blurs vision at all distances and may cause discomfort to the computer operator. It is caused by the front surface of the eye being oval and not round. Prescription lenses that are worn only when using a computer can help operators with mild astigmatism but people with greater astigmatism may need to wear glasses all the time.

Many other conditions can make the computer screen appear blurred, increase susceptibility to glare, or otherwise make computer use difficult. They include poor eye coordination, shortsightedness and eye focusing problems. Your optometrist can diagnose these conditions and advise you on treatment suitable for computer operation.



## How can glasses help make computer work easier?

Using glasses with an anti-glare coating while using digital screens reduces the impact of light reflections on your eyes, ultimately minimizing strain.

While progressive lenses are designed to provide a seamless transition from distance to near vision, and bifocals offer two distinct viewing zones, extended focus lenses are specifically optimized for intermediate tasks like computer work. For individuals who spend a significant amount of time in front of screens, extended focus lenses can offer superior comfort and functionality.

Extended focus lenses, also known as office or computer lenses, are specifically designed to improve visual comfort and performance for tasks involving close to intermediate distances,

such as computer work. Advantages of using extended focus lenses over progressive or bifocal lenses for computer work include:

- **Optimized for Intermediate and Near Vision:** Extended focus lenses are tailored for the distance at which computer screens are typically placed. They provide a wider field of clear vision for this specific range, reducing the need to tilt the head or adjust posture frequently.
- **Reduced Eye Strain:** Since these lenses are designed for the specific distance of computer screens, they reduce the strain on the eyes caused by constantly adjusting focus. This can help prevent symptoms of digital eye strain, such as headaches, dry eyes, and blurred vision.
- **Wider Viewing Area:** Compared to progressive lenses, which have a gradual change in prescription from top to bottom, extended focus lenses offer a wider and more stable intermediate viewing area. This means less distortion and a larger area of clear vision, making it easier to view the entire screen without moving the head excessively.
- **Comfortable Posture:** Extended focus lenses can help maintain a more natural and comfortable posture. Unlike bifocals, where the user has to tilt their head back to see the screen through the lower segment, extended focus lenses allow for a more straightforward and ergonomic viewing angle.
- **Enhanced Productivity:** By providing clear and comfortable vision for computer work, extended focus lenses can help improve productivity. Users can focus more on their tasks without frequent interruptions to adjust their glasses or posture.
- **Customizable Design:** These lenses can be tailored to an individual's specific working distance and environment. This customization can further enhance visual comfort and effectiveness.