Occupational Health & Safety

Computer User Guide &
Self Assessment Checklist

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INTRODUCTION

This document has been prepared to provide computer uses with basic guidelines on managing their computer workstations from an OH&S perspective. It is by no means a complete guide to safe computer operation, however it will provide the individual with some knowledge of muscle strain injuries, the principles of ergonomics and managing their computer workstation to effectively prevent computer related injuries.

CAUSES OF COMPUTER RELATED INJURIES

It is generally perceived that the injuries that people suffer from as a result of using computers are repetitive strain injuries (RSI). This is true providing that it is clearly understood that the word "repetitive" does not just refer to a continuous action of some particular body part. RSI means damage to muscles, tendons, nerves and other soft tissue caused by repetitive work over a period of time, involving some type of force, such as keyboard work.

Continuous action of one particular body part is only one cause of soft tissue strain injuries, and often when an individual has been diagnosed with having RSI they will be at a loss as to how it occurred because they don't fully understand the causes of RSI. This doesn't really matter with regard to the medical treatment of the injury, but it does greatly affect correcting the problem at the computer workstation. Often there are several distinct causes of RSI and sometimes it is a combination of these that cause an injury.

These are:

1. Repetition or Dynamic Muscle Loading

When your body is required to continuously perform the same movements day after day with the same body part, it doesn't get the opportunity to repair, and the damage builds up till the point where it affects your ability to do your job. Unfortunately most people don't do anything about it until they get to the stage where they can't do their job at all. This is a case where RSI can develop.

2. Static Muscle Loading

This where you hold your body in the one position for prolonged periods. When you use a computer, you actually hold your body in position by contracting your muscles, particularly your upper half, being your shoulders, neck, arms, wrists and hands. When muscles are flexed, the blood flow is greatly restricted, starving the muscles of essential oxygen and nutrients. The stresses placed on the body by static muscle loading increases when the body is required to twist or reach out

3. Contact Stress

Caused by direct pressure on muscles, nerves and tendons against a hard object, possibly with an angled surface such as the edge of a desk or even a mouse pad. This affects the blood circulation and bruises the soft tissues.

4. Posture

The way you approach your computer will greatly affect the probability of being injured by the above 3 mentioned causes. Factors such as twisting of the neck, reaching out to objects and assuming inappropriate positions will place more strain on your body and injury is more likely to occur. To prevent injuries from occurring the principles of ergonomics are applied.

ERGONOMICS

To prevent computer operators from being injured, the principles of "ergonomics" are applied. The word "ergonomics", is derived from the Greek words ergos and nomos. Ergos means "work" and nomos meaning law ie "the laws of work".

Other related similar terms are human factors, human engineering or human factors engineering, or whatever you want to call it, it is essentially fitting the task to the person and not the other way around.

It should be noted that ergonomics does not just refer to the physical environment such as the design of desks and chairs. Other factors such as work organisation or how procedures can be completed are also included. The expected outcomes of applying ergonomic principles are:

1. Increased productivity and quality;
2. Increased job satisfaction;
3. Lower staff turnover;
4. Lower likelihood of injury or illness occurrence; and
5. Lower costs of replacing staff, retraining or lost time injuries.

The first step in applying ergonomics to a computer workstation is designing the workstation to allow the body to stay in "neutral", that is no undue twisting, folding arms and legs or flexing muscles.

A good example of the human body in "neutral" is the "anatomical position" (shown right). Notice how the head is facing forward with the limbs fully extended with the palms of the hands facing outward. The muscles are relaxed, which enables the blood to circulate without restriction, providing the soft tissues with the required oxygen and nutrients to stay healthy.

Of course it is impossible to operate a computer in this anatomical position, however, wherever possible, the characteristics of this position should be applied when designing and utilising a computer workstation

The spine (shown left) is another feature of the anatomical position that is relevant to computer users. The diagram below depicts a side view, where the spine forms an "S" shape. It is essential that this "S" shape is maintained when operating a computer because it is in this position the spine is at its strongest and most effective to support not only the muscles of the back, but also the neck and shoulders.

PREVENTING WORKPLACE INJURIES

1.

The main objective in managing your computer workstation is to stay healthy and prevent injuries from occurring in the first place.

2.

The appropriate furniture and equipment for the task, and organising your computer workstation appropriately will provide you with the basic tools to minimise the risk of injury, but that is only half of it.

3.

All the ergonomic furniture and equipment in the world will serve you little purpose unless you are prepared to look after yourself. Hammering away at the keyboard for hours on end, without taking breaks and ignoring pain is asking for trouble. Think about the task you are doing, use this document to assist you in managing your computer workstation more safely.

COMPUTER WORKSTATION SELF ASSESSMENT

Name: ………………..………….....……………….……….. Date ___/___/_____

Use this assessment to check off each step as you work through the Computer Users Guide.   If your computer workstation meets the requirements of Steps 1-9 or, if you have made the changes as recommended, tick the "YES" box. If your workstation doesn't meet the requirements and you haven't been able make suitable changes, tick the "NO" box. Note in each step any changes that need to be made to your workstation and any issues that you feel are important to manage your computer usage more effectively.

STEP 1. THE CHAIR FOR COMPUTER OPERATION

Step	Completed & OK (✔)		Note the following: Changes that need to be made to your workstation; and/or Aany issues, such as potential problems or things you think may be helpful in managing your workstation
	YES	**NO**	
1a			
1b			
1c			
1d			

STEP 2. ADJUSTING YOUR CHAIR

Step	Completed & OK (✔)		Note the following: Changes that need to be made to your workstation; and/or Any issues, such as potential problems or things you think may be helpful in managing your workstation
	YES	**NO**	
2a			
2b			
2c			
2d			

STEP 3. SITTING AT YOUR DESK

Step	Completed & OK (✔)		Note the following: Changes that need to be made to your workstation; and/or Any issues, such as potential problems or things you think may be helpful in managing your workstation
	YES	**NO**	
3a			
3b			
3c			
3d			

STEP 4. POSITIONING THE MONITOR

Step	Completed & OK (✔)		Note the following: Changes that need to be made to your workstation; and/or Any issues, such as potential problems or things you think may be helpful in managing your workstation
	YES	**NO**	
4a			
4b			
4c			

STEP 5. ORGANISING YOUR WORK-SPACE

Step	Completed & OK (✔)		Note the following: Changes that need to be made to your workstation; and/or Any issues, such as potential problems or things you think may be helpful in managing your workstation
	YES	**NO**	
5a			
5b			
5c			
5d			
5e			
5f			

STEP 6. KEYBOARD BASICS

Step	Completed & OK (✔)		Note the following: Changes that need to be made to your workstation; and/or Any issues, such as potential problems or things you think may be helpful in managing your workstation
	YES	**NO**	
6a			
6b			
6c			

STEP 7. MOUSE BASICS

Step	Completed & OK (✔)		Note the following: Changes that need to be made to your workstation; and/or Any issues, such as potential problems or things you think may be helpful in managing your workstation
	YES	**NO**	
7a			
7b			
7c			

STEP 8. PHONE BASICS

Step	Completed & OK (✔)		Note the following: Changes that need to be made to your workstation; and/or Any issues, such as potential problems or things you think may be helpful in managing your workstation
	YES	**NO**	
8a			
8b			
8c			

STEP 9. EYE BASICS

Step	Completed & OK (✔)		Note the following: Changes that need to be made to your workstation; and/or Any issues, such as potential problems or things you think may be helpful in managing your workstation
	YES	**NO**	
9a			
9b			
9c			

STEP 10. EXERCISES

Do you intend to follow the recommendations in the Step (✔)?

YES ☐

NO ☐

Comments:

STEP 11. MICRO-BREAKS

Do you intend to follow the recommendations in the Step (✔)?
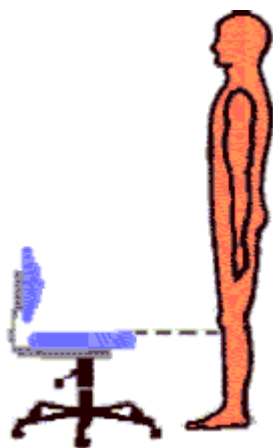
YES ☐

NO ☐

Comments:

STEP 1. THE CHAIR FOR COMPUTER OPERATION

It is essential to have a suitable chair when operating a computer and it should possess the features depicted in the diagram below.

1a. Adjustable Back Rest Angle

1e. Height Adjustable backrest

1b. Tilting seat-pan

1c. Height Adjustable seat-pan

1d. 5-star base with:
- wheels for carpeted areas; or
- castors for hard surfaces
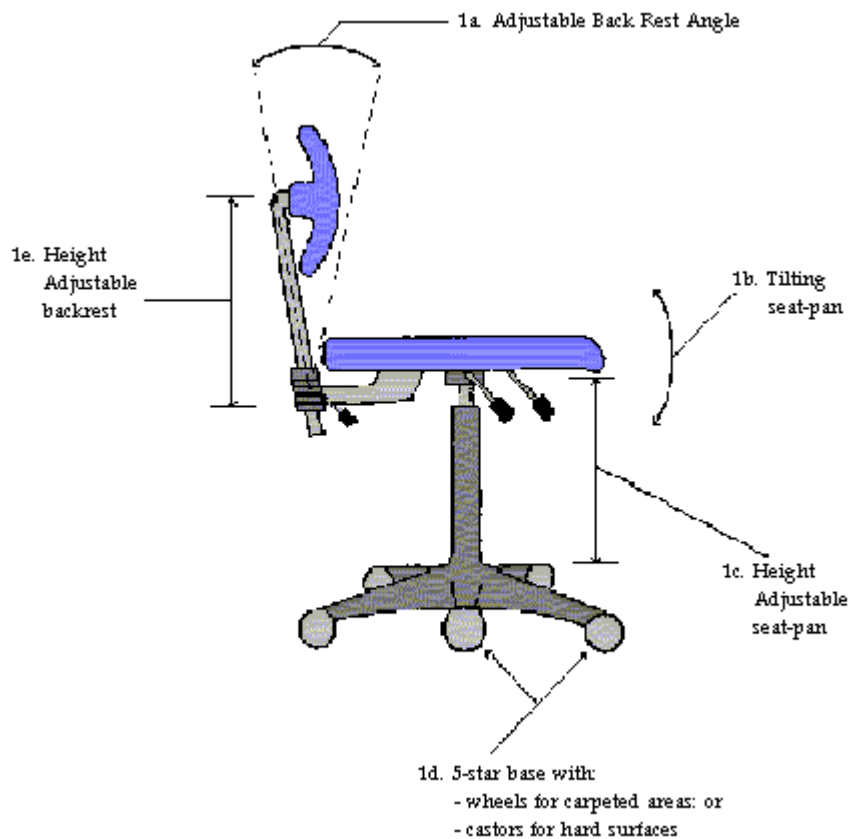
STEP 2. ADJUSTING YOUR CHAIR

2a.

- Place the chair in front of you, adjust the height so that the front of the seat pan is just below your knee

2b.

- Sit on the chair and keep your feet flat on the floor.
- Grasp the back of your legs between the seat-pan and the back of your knee.
- Wiggle back or forward until you can just fit your hand comfortably between the seat-pan and the back of your knee.

2c.

- Adjust the backrest up and down so that it fits into the small of your back. To find the small of your back, place your hands on your waist (not to be confused with your hips). Note where your thumbs are, and that is the area of your back to be supported.
- Lean against the backrest until your back is at least 90° to your legs, although a slightly more open posture is better, up to 10° more (100°).
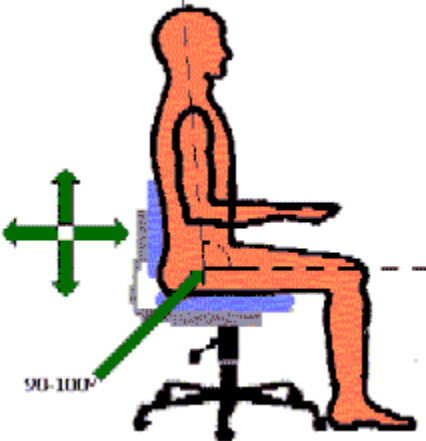
2d.

- Tilting the seat-pan a fraction downward helps give your body a slightly more open posture and relieves any pressure you might have under your legs.

THE BACKREST IS THERE TO SUPPORT YOUR BACK, MAKE SURE YOU USE IT!

STEP 3. SITTING AT YOUR DESK

3a.

- Approach your desk and place the keyboard directly in front of you, but give yourself enough space between the keyboard and the edge of the desk so that you can rest the pad of your thumb lightly on the desk for a moment when you are not typing. Never rest your wrist on the on the desk.
- Keeping your wrists straight, observe the angle of your forearm. If it is parallel to the floor, or slightly more open, up to a 100° angle at the elbow joint, then move on to Step 4. If not, then proceed to 3b.

Note:
Taller people may find that the drop keyboard mechanism interferes with the top of their legs. If this is the case, arrange to have the mechanism removed and the keyboard fixed, but make sure that the mechanism remains readily accessible because the next person to use the desk after you may need to have it refitted.

3b.
If you find that your elbow joint is open more than 110° adjust your chair or desk height . If your elbow joint is less than 90°, then follow the flow chart below.

9
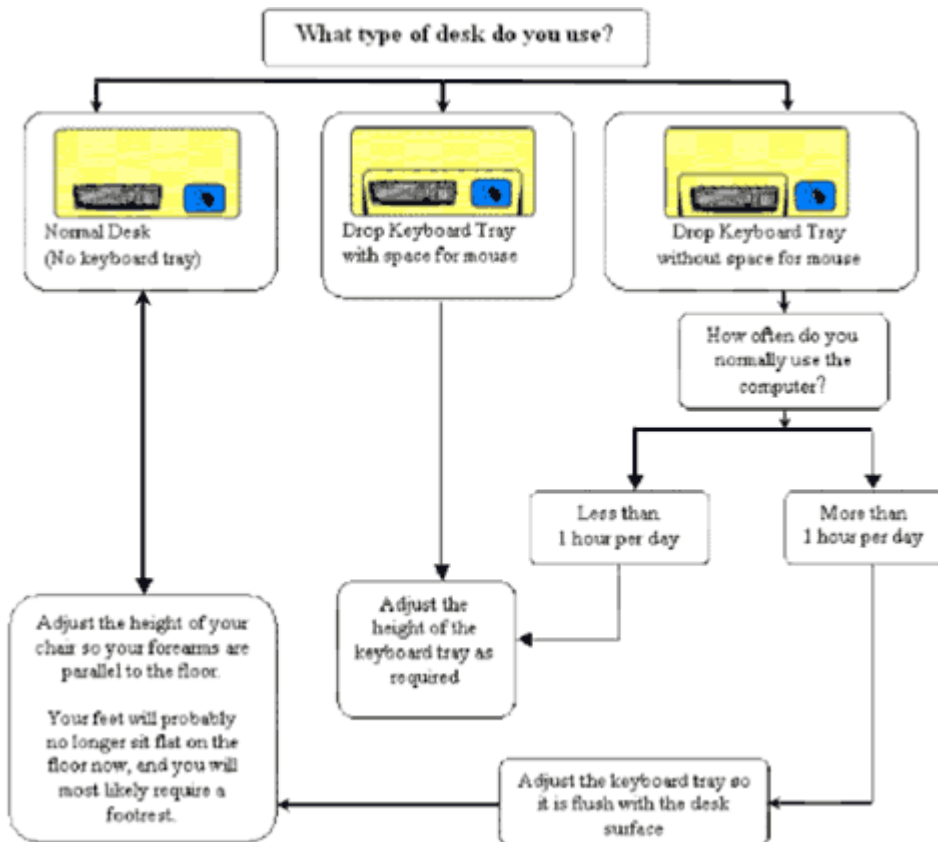
STEP 4. POSITIONING THE MONITOR

4a.

- Position the monitor directly in front of you at a comfortable distance in between 350-750mm. See also EYE BASICS
- The top of the monitor screen should be no higher than eye level. Placing the monitor a few inches lower is quite acceptable.
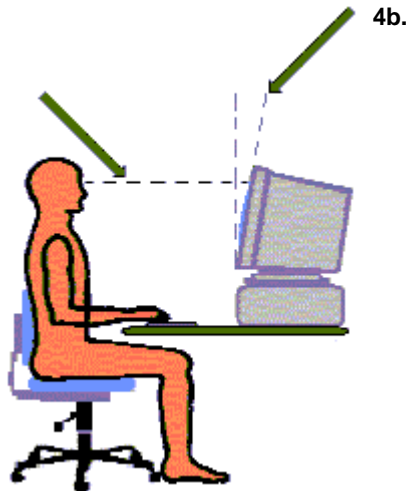
4b.

- Tilt the monitor screen back between 10-15°, depending on your comfort. Use the monitor angle guide below to assist you in establishing the correct monitor angle.

Monitor Angle Guide

Place this guide on the same surface and along side of your monitor. Looking at your monitor from the side-view, set the angle of the monitor so the front face is within the shaded area of the inverted triangle.
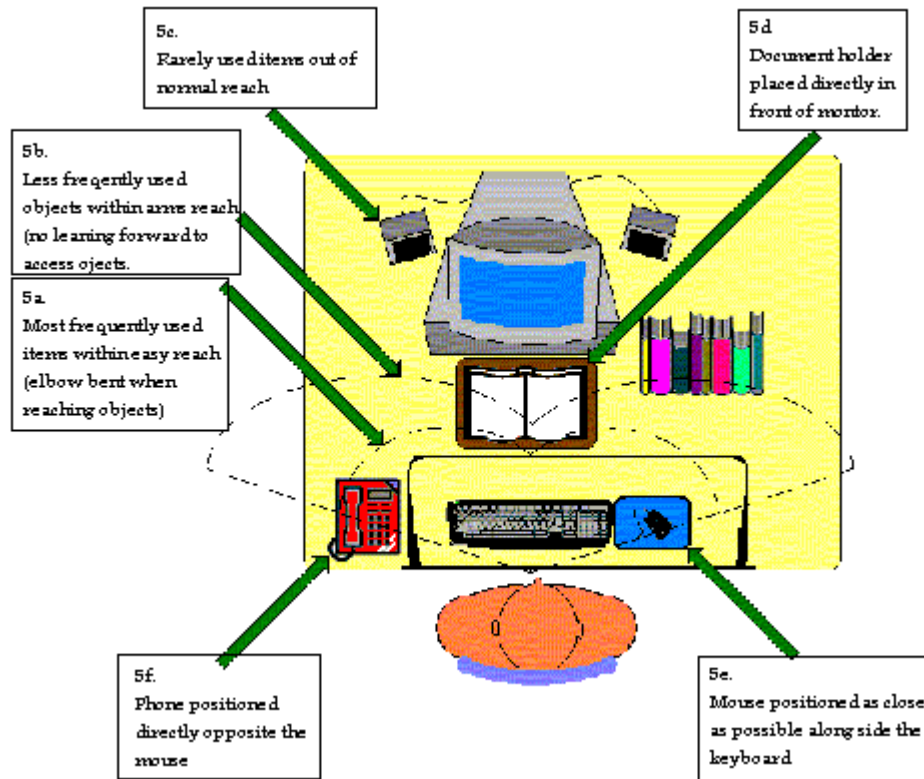
If you want to use the Monitor Angle Guide - You can download a copy of the computer user guide from our website by clicking on the icon below-

STEP 5. ORGANISING YOUR WORK-SPACE

Organise your work-space so that the most commonly used items are closest to you and the less used items are further away, because the further you reach out, the more strain you place on your body. Wherever possible avoid twisting of the head and torso.

5c.
Rarely used items out of normal reach

5d
Document holder placed directly in front of monitor.

5b.
Less freqently used objects within arms reach (no leaning forward to access ojects.

5a.
Most frequently used items within easy reach (elbow bent when reaching objects)

5f.
Phone positioned directly opposite the mouse

5e.
Mouse positioned as close as possible along side the keyboard

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6. KEYBOARD BASICS

The general rule of thumb is to keep the hand and wrist straight when operating the keyboard. For short pauses (1-3 seconds), when typing, it is OK to allow the pad of the thumb to lightly rest on the desk, this gives the muscles of the hands, arms and shoulders a few moments to recover. For rest periods longer than a few seconds, say reading a paragraph, take your hands away from the desk surface and rest them on your lap or do a couple of exercises.
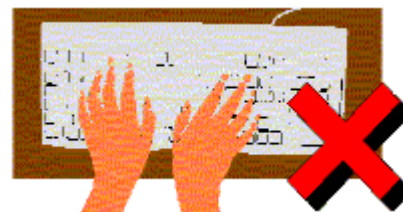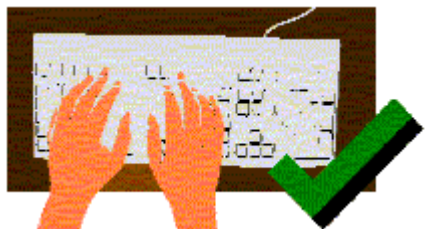
6a.
When using the keyboard, the top of the hand should be an extension of the top of the forearm with the fingers slightly curved. The wrist should never be placed on the desk surface while operating the keyboard due to the angle of the wrist and pressure placed on the wrist joint.
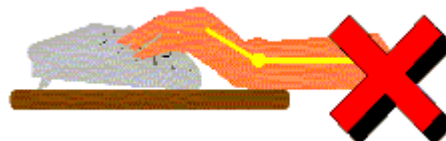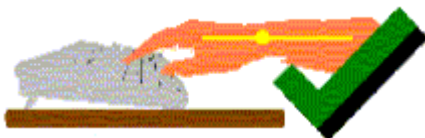
6b.
The wrists should be straight, with the middle finger in-line with your forearm.

6c.
Don't peck at the keyboard. Using excessive force when keying is not only unnecessary, but it also places strain on the

soft tissues of the fingers. If you currently don't touch type, it would be much healthier for you to learn

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7. MOUSE BASICS

Avoiding the mouse trap

Computer mouse use is ever increasing and unfortunately for computer operators is not without its hazards. Current ergonomic advice is that the majority of injuries to computer users are derived from mouse use. Injuries to the fingers, wrist, arm, elbow, shoulder and neck are common, however they are preventable. By following these tips below (or at least some of them), you are taking a big step to safer computing.

7a. Is your mouse working properly?

Take a good look and inspect your mouse. Does is function properly? Check that the track ball is not full of grit and is in good working order. If you have to lift your mouse off the mouse pad to get the pointer to go where you want it to, then it doesn't work properly, the tract ball may need a clean, or it may even be worn out. Also you need to check your mouse pad, If you find that you are chasing your mouse around the desk because your mouse pad won't grip the desk surface it either needs to be cleaned or replaced.

7b. Position your mouse correctly

Your mouse should be as close to you as possible. If you have to extend your arm at the elbow any more than you need to operate your keyboard, then it is too far away, and no, leaning forward doesn't count. Ideally your mouse should be positioned alongside and at the same height as the keyboard. A good rule of thumb is if the mouse pad touches the side of the keyboard, it's OK.

7c. Place your hand on your mouse only when you are using it

Place your hand on your mouse only to use it, and when your not using it, take it off and place your hand on your lap or down by your side or even better still, once in a while do some exercises. Also, don't choke the mouse, only apply the pressure necessary to manipulate it.

7d. Alternate between left and right hands when using the mouse

Teach yourself to use the mouse with your opposite hand. It may seem very difficult at first, however with patience and a good practice regime, you can do it. A good way is to start is with 5 minutes after morning tea and 5 minutes after lunch. Gradually as you get better increase the time frame until you find that you use the mouse an equal amount of time with either hand.

7e. Use Different Moving Parts

You don't always have to move your mouse from the upper arm. You can also use or your wrist and fingers to move your mouse around the mouse pad, although not as much. Try the 90/10 rule. That is use or upper arm 90% of the time and your wrist and fingers 10% of the time. This gives your shoulder and neck a rest-break.

7f. Alternate Devices

There are other devices available on the market today, however whether these are a better option or not, is yet to be fully determined. However recent studies on alternate pointing devices have identified the "track ball" as the most likely alternative to benefit mouse users. Depending on the individual, it might be better to use the trackball in conjunction with the mouse.

7g. Listen to your body

If your shoulder, arm, elbow, wrist or fingers are sore from using the computer, your body is trying to tell you it needs a rest break. If you follow the recommendations later in this document regarding exercising and rest breaks it shouldn't get to this stage.

However, if you choose not to exercise, take breaks or ignore pain because you think that you are too busy, or it'll ruin your train of thought, then you are asking for trouble, because it is under these circumstances that injury is most likely to occur.

8. PHONE BASICS

8a.
The one major hazard associated with using the phone is holding the phone-piece between your ear and your shoulder to free your hands to do other tasks. This is extremely stressful to the muscles of the shoulder and neck, particularly because your hands are either writing or keying, which places added strain on the muscles.

Telephone headsets allow the keyboard operator to have their hands free to do tasks other than holding the phone-piece. These items can be expensive so selecting the right one the first time is essential. From an ergonomic point of view, there are two main types. These are:

1. Ear-piece type	**2. Headband type**

Advantages: Easily attached with one hand.

Disadvantage: Can be uncomfortable for some operators due to the pressure on the side of the over long periods.

Advantage: More comfortable than Ear-piece Type.

Disadvantage: Difficult to attach with one hand, can mess-up your hair.

Telephone headset should have a peak impulse noise regulator as a minimum requirement to prevent hearing damage.

Alternatively a hands free phone can be used, however this may affect the comfort and concentration of staff around you and is most suited to single offices, where privacy can be maintained.

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9. EYE BASICS

The eye problems experienced by computer operators are sharp and dull pains, dry or watering eyes, burning sensations, tightness, tiredness, headaches, and other forms of discomfort, which can all be called "eyestrain".

There is very little evidence to support that using the computer can cause eye damage, it is more likely that using the computer makes the operator realise that they need glasses. The eyestrain that most people suffer from can be as a result of a number of factors, and in the vast majority of cases, it is only a temporary situation. The discomfort will subside once the cause of the eye strain corrected. Causes of eyestrain are listed below.

9a. Direct Glare:
Caused by overhead lights and lamps shining directly into your eyes. Direct glare can also be a problem when a computer is positioned directly in front of a window. To find out whether direct glare is a problem, temporarily shield the light source and you will immediately notice the difference.
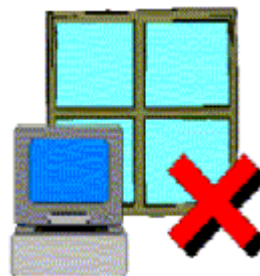
9b. Indirect or Reflected Glare:
Caused by light deflecting off surfaces and into your eyes. Objects and walls in glossy dark colours or shiny metal surfaces even as small as your watch face can cause this. Indirect glare is unlikely do you any permanent harm, but can certainly be very annoying.

Light reflected off the computer monitor is also unlikely to cause eyestrain, however it may make you assume an inappropriate posture in order to see the screen. The same method of determining if indirect glare is a problem applies as mentioned above.
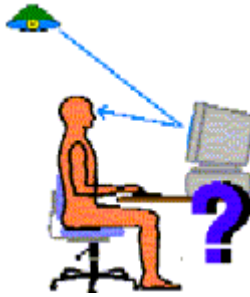
9c. Bifocal Glasses:
If you wear bifocal glasses, you may find that you are tilting your head backward in order to see the screen. This places strain on the neck and shoulders and should be avoided. Bifocals are designed for reading, not computer work and you should see your optometrist about options available to you.

In the short term you can place the monitor directly onto the table surface so you are looking down without pushing your head backward to see the screen, but you should see your optometrist soon.

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10. EXERCISES

Exercising is one of the most effective ways of reducing muscle fatigue and the possibility of injury occurrence when using the computer. Warm-up exercises prepare your body for your next period of work, and Micro-breaks keep the body loose while using the computer. However there are rules to exercising which are;

1. **Never** stretch to the point where you feel pain;

2. If you have a medical condition or are under going any type of medical treatment, you **must** consult your medical practitioner **before** doing any of these exercises;

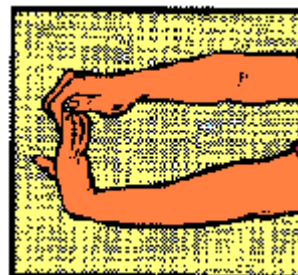3. **Always** apply a slow and gentle stretching action.

2-MINUTE WARM-UP EXERCISES

Do these before commencing work and after lunch.
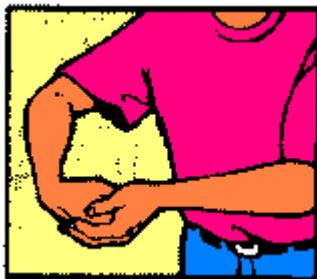
Exercise 1
Bend your wrist and fingers with your other hand, bending your elbow slightly at the same time, until you feel the stretch over the back of your forearm. Hold the position for 30 seconds
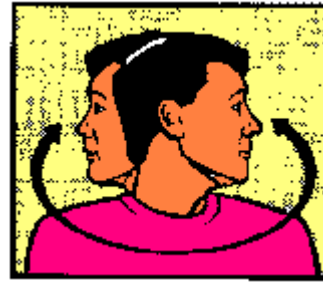
Exercise 2
Stretch your arm out in front of you with your elbow straight, palm facing away from you (fingers pointing up or down). With your other hand pull your fingers backward until your feel the stretch over the front of your forearm. Hold the position for 30 seconds

Exercise 3
Tuck your chin down onto your chest and gently turn your head from side to side, keeping your chin on your chest. Do this ten times.

Exercise 4
Turn your head slowly from side to side ten times.

11. MICRO-BREAKS

Micro-breaks are rest pauses and exercises that can be done while you are at your computer workstation. These can be done to prevent your body from becoming fatigued during your working day. A good way to apply these Micro-break exercises is to follow the "30/30/30" rule, which is:

Every 30 minutes, take a 30-second break, and look at an object 30 metres away and while doing this, do one or more of the following exercises, and follow these rules;

1. **Never** stretch to the point where you feel pain;

2. If you have a medical condition or are under going any type of medical treatment, you **must** consult your medical practitioner **before** doing any of these exercises;

3. **Always** apply a slow and gentle stretching action.

Exercise 1. Tall stretch:
Interlock fingers, palms up. Stretch arms above the head until they are straight. Do not arch the back.

Exercise 2. Shoulder roll:
Roll the shoulders - raise them, pull them back, then drop them and relax. Repeat in the opposite direction.

Exercise 3. Side stretch:
Drop left shoulder, reaching left hand towards the floor. Return to starting position. Repeat on right side.

Exercise 4. Back curl:
Grasp shin, lift leg off the floor. Send forward curling the back, with nose towards the knee. Note: This exercise should not be used in pre-post-natal conditions

If you feel as though one or some of the exercises are not working for you, or cause you discomfort, then don't continue. What works for some, doesn't always work for everyone