

The problem with computers...

Is that an increasing number of people are suffering from musculoskeletal pain as a result of using them. A recent assessment by the Musculoskeletal Occupational Surveillance Scheme (MOSS – see the website at <http://www.coeh.man.ac.uk/thor/moss.htm>) suggested that nearly 40% of people seen by rheumatologists or occupational health physicians with upper limb pain may be computer users. Why?

Perhaps a more interesting question is – what? For years people have appeared in clinics with pains that have been classified as repetitive strain injury. This is an awkward and unhelpful term, as it implies that the cause is repetitive (true) that it is a muscle strain (usually not true) and that it is due to some acute event which, of course, is not the case given the repetitive stimulus. Professionals have struggled to find a better term, and work-related upper limb disorder, or non-specific upper limb pain, are two such. These give a much fairer descriptive label and do not imply that some injury is responsible. But, in fact, many of the problems are nothing to do with joints, ligaments or tendons at all, but are problems of muscles or the nerves that make them work.

Most people have heard of writer's cramp. This is a nuisance problem afflicting those who write a lot and who find that as time passes it becomes more and more difficult to hold a pen because the hand and forearm muscles tense up. Indeed many sufferers discover that the symptoms arrive more and more quickly. Worse still, when they try to switch to using the other hand to write, the symptoms begin on that side also. It is now recognised that writer's cramp is an abnormality of muscle tone; in other words, when the muscles send their signals to the brain and vice-versa, the signals become amplified and tighten the relevant muscles in an abnormal way. Medical treatments for this problem, known as dystonia, include the use of special drugs that interfere with nerve transmission (gabapentin and pregabalin are two) and muscle paralysing injections with botulinum toxin, popularly known as Botox, although this is a trade name. However the only reliable way of keeping the condition away is to avoid the activity that provokes it.

Many computer users have a very similar problem and it is often due to overuse of particular muscle groups. It presents itself as an aching, cramp-like pain in one or both arms. This gets worse as time on the computer passes, but it is often worse in the arm with which the mouse is used – hence our popular term “mouse arm”. Typically you will find that the problem settles if you are away from the keyboard and mouse, for example on holiday. The usual cause is poor keyboard and mouse positioning. If you are at a stretch, you will get into trouble, and it will often last for minutes or hours after you stop work.

Test this for yourself by standing up and holding your hands and arms up as if you are placing them on the shoulders of someone in front of you. Hold them quite steady, and after about a minute you will be feeling quite uncomfortable.

If you are working at a computer for any time it is essential that your arm muscles are not under strain. Sit in your office chair, with your forearms on the arms of the chair and shoulders relaxed, and your hands should fall naturally onto the keyboard. In

many offices, or even at home, this will not happen, as the keyboard is on a normal height desk, which is too high. It needs to be on a keyboard slide about 3-5 inches below the desk itself, and the mouse needs to be right next door. Examine the photograph below. What is wrong about this office set-up?



Working in the NHS does not allow for perfect ergonomics, especially for doctors! As far as the computer goes almost everything is wrong here. The keyboard is on the desk (which is at writing height, so is too high. It is off at an angle and the screen is not that big, yet is at the far side of the desk. Note also how the only place for the mouse mat leaves the right arm at full stretch and how I am having to lean forward and sideways to reach it (and see the screen) while the chair is actually square on. There is no support for my right arm so, to keep it on the mouse, I have to use my upper arm and shoulder muscles as well as those in forearm and hand. Try sitting with your right arm out here for any time and, as I do, you will get an ache in it, gradually becoming more uncomfortable. Your neck will also start to hurt because you are sitting craned forward as the second picture shows more clearly.

A work position like this is bound to cause problems. There is also another factor which will help provoke forearm discomfort. Close your eyes again; lightly make a fist with each hand, lift both arms above your head and return them to a resting position with your forearms on the desk or table. You will realise, when you open your eyes, that they are in a natural position with the sides of your hands on the desk – the handshake position. Then – think about whether this relaxed position is how your hands sit when using the keyboard or mouse – and the answer is no. You have to twist your hands over so they face downwards. The action, called pronation, increases the forearm muscle tension and in combination with a stretching movement is quite uncomfortable if maintained for any period. So even if your keyboard is perfectly positioned your mouse-using arm will give trouble.

Thus it is vital to ensure that your mouse is within relaxed reach – usually slightly nearer to your chair than the keyboard, but right next to it. See my “home” position below! I am square-on to the screen (which is large enough for me to be able to see without craning forward); my hands fall naturally onto the keyboard which is on a slide under the desk; the mouse is immediately adjacent and my left forearm rests comfortably on the arm of the chair (my right wrist is, in fact, resting on a pad in the mouse mat, but when I am typing sits on the chair arm). To write I push the keyboard slide away and turn left to the pull-out desk, which is higher than the keyboard.



It's important to start off like this; I see quite a number of teenagers and young adults with problems and when you look at their working posture you can see why. Laptops are wonderful, but putting them on the floor and sitting cross-legged in front of them is not a great idea.

There are shaped keyboards that allow your hands to sit more naturally, but you have to re-train yourself to the different key position, especially if you are a proper touch-typist. More usefully there is a mouse design that allows your hand to sit sideways – the vertical mouse! Two main designs for this exist; a joystick pattern and a conventional mouse turned over. Both allow you to use your arm in the comfortable “handshake” position.



These are not cheap (around £70). However it is now a legal requirement in the UK for employers to conduct proper workplace assessments, and to fund necessary improvements to an employee's workstation.

The Health & Safety Executive have published a useful summary which can be found at <http://www.hse.gov.uk/pubns/indg36.pdf>.

So – before you rush off to the doctor to get tablets for your “RSI” make sure you are not causing the problem – and if so, fix it first! Good luck.

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References:

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