



Ergonomics and Repetitive Strain Injury

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What is RSI?

Repetitive Strain Injury, commonly known as RSI, is the umbrella term for a number of upper limb disorders. There are two major groups of RSI conditions; RSI Type 1, which has measurable physical symptoms, and Type 2 RSI which offers no apparent physical symptoms and some medical experts therefore do not accept the existence of itⁱ.

What causes RSI?

There are a number of contributing factors which can lead to the onset of RSI. Below is a list from WorkSmartⁱⁱ, an organisation from the Trade Union Congress (TUC), detailing what they believe are the most recognised causes of RSI;

- Repeating the same sequence of movements many times an hour or day.
- Static posture, sitting in the same position for hours on end.
- Having to work very fast, under pressure.
- Having to use appreciable force.
- Lack of control over the order of tasks or working methods.
- Working in awkward or tiring positions.

How many reported RSI injuries are there every year?

The latest Health and Safety Executive (HSE) figures show that in 2006/7 there was an increase in the number of new RSI cases reported and the number of people overall being affected by the condition. The period saw 115,000 new cases of work-related upper limb disorders being reported, compared with 86,000 new cases in 2005/6. Additionally in 2006/7 the total number of people reporting an RSI problem rose from 374,000 to 426,000ⁱⁱⁱ.

What do these RSI injuries cost businesses every year?

The Chartered Society of Physiotherapy (CSP) has estimated that RSI costs UK employers around £300 million each year, through lost working time, sick pay and administration^{iv}. This amounts to around 3.5 million working days being lost each year as workers take time off because of RSI, with each person affected taking an average of 13 days off sick^v.

Interestingly, in an article published in the Hexham Courant in March '08^{vi}, it was reported that Health and Safety Executive figures analysed by the Labour Research Department for the CSP, show the highest number of sufferers of RSI are in the North-East of the UK, with around 23,000 suffering with the condition. The pervasiveness of the condition in this region is 1.24 per 100 workers, with the lowest reported rate in London (0.69 per 100)^{vii}.

What are the high-risk jobs? – Breakdown by industry

People who work in the following jobs are those deemed by the Health and Safety Executive to be most at risk from developing RSI as a result of their occupation.

- Plumbers, painters and carpenters in construction (1.26 per 100 workers)
- Nurses and paramedics in the health service (1.08 per 100 workers)
- Plant and machine operatives (1.03 per 100 workers)

From the same findings, those least at risk from developing RSI are deemed to be;

- Cleaners, security guards and waiters (0.41 per 100 workers)
- Estate Agents and professionals such as financial analysts and analysts (0.44 per 100 workers)

The table below, from The Chartered Society of Physiotherapy^{viii}, based on HSE statistics, shows estimated prevalence and rates of self-reported musculoskeletal disorders mainly affecting the upper limbs or neck caused or made worse by current or most recent job, by occupation, for people working in the last 12 months, averaged 2003/04-2005/06

Occupation description	Rate per 100 employed in the last 12 months	Prevalence
Skilled construction and building trades	1.26	14,000
Health and social welfare associate professionals	1.08	12,000
Process, plant and machine operatives	1.03	11,000
Skilled metal and electrical trades	0.93	11,000
Culture, media and sports occupations	0.88	5,000
Textiles, printing and other skilled trades	0.81	5,000
Transport and mobile machine drivers and operatives	0.79	8,000
Elementary trades, plant and storage related occupations	0.75	8,000
Secretarial and related occupations	0.7	6,000
Leisure and other personal service occupations	0.67	4,000
All occupations	0.62	181,000

Source: HSE

http://www.hse.gov.uk/statistics/lfs/0506/ulnocc2_3yr.htm (detailed breakdown)

NB. Breakdowns by occupation and region are not yet available for 2006/7. HSE is currently using the previous survey SWI05/06, from which the tables are derived.

Teleworking and working on the go

Accurate data has proved hard to find on mobile workers in the UK, as the term is so broad and could include a large majority of the working population, but a good indication can be based on statistics from 2005 on teleworkers. The number of which saw a large increase between 1997 and 2005; 150 percent (1.5 million)^{ix}.

The concept of teleworking emerged around the early 1980's when the development of telecommunication systems made it possible for people to work from home. Since then this concept has widened further, with new technologies such as Blackberry and wireless internet allowing for people to work and be connected to the office almost anywhere. And of course in today's global climate, such technologies do not just benefit those who are termed 'teleworkers', but also every business person who has to travel, be contactable at all times, is time pressured or simply uses commute time to catch-up on emails.

Can mobile work equipment cause RSI or make it worse?

Increasingly, technology which was designed to aid workers in enabling them to work remotely or on the move is being blamed for causing RSI or making existing RSI symptoms worse. The relatively recent introduction of the *Blackberry* device into the workplace has seen the emergence of a new form of RSI, "*Blackberry Thumb*". This is caused by the repetitive and abnormal movement of the thumb whilst the device is held by the fingers and the thumb is used to tap out the message. On a standard PC station, the thumb is usually given the task of tapping the space bar only, as the constant flex and rotation of the thumb joint can cause it to become sore and thus lead to RSI^x.

Laptop use causes a similar issue with the potential to cause RSI. With low prices, the rise in people working at home and wireless access to the internet, laptops are becoming more and more popular and no longer just for the travelling business person. In 2005 laptops outsold desktop computers for the first time^{xi}. This technology was not designed to replace the existing PC station, but to be an additional source, so when they are used daily in place of a desktop, they can cause injury. The main issues are with the screen not being at head height, the keyboard being attached to the screen so the operator either has to have the screen too close to the eyes or are stretched through the arms in reaching the keyboard. Laptops also encourage 'hot-desking' so workers do not have individual workstations set up according to their specific needs.

Simple solutions to minimise the risks with the use of these technologies are:-

For Blackberry's

- Don't send long emails from Blackberry's if avoidable, instead use normal keyboards for these
- Rest thumbs regularly and do not carry on with any activity which is causing pain

For Laptop's^{xii}

- Use a separate keyboard and mouse
- Use a laptop stand to raise the screen to eye level
- Work on a stable base and not on your lap
- Take regular breaks to relieve upper body tension
- Sit up straight with your lower back supported

The Importance of Neutral Positioning

Neutral positioning of the fingers, wrist, forearm, elbow, shoulder and neck will help reduce the risk of developing RSI. Having a workstation which is set-up to allow and encourage this neutral position, where reduced stress and strains are put on joints, tendons and muscles will also improve work comfort. The release of recently commissioned research by Fellowes, as supplier of workspace solutions, shows that 36% of office workers have never had a formal workstation assessment. Another 12% claim their last assessment was so long ago that they can no longer recall the advice they received at the time. A further statistic to concern employers which emerged from this research, is that 75% of employees claimed they would consider suing their employer over a workplace injury^{xiii}.

Popular Ergonomic Solutions to RSI with computers

There are many suggested ergonomic solutions for workers in an office based environment, who use desktops and laptops on a daily basis. The most popular and widely available are as follows:-



The articulating keyboard – designed to reduce the risk of RSI by allowing the user to “relax” at their workstation and not make repetitive stressful movements affecting their arms, neck and upper back. It is best used in conjunction with a chair that allows for correct posture.

Monitor Arms – Flat panel monitors can now be used in conjunction with monitor arms. Being able to adjust a monitor to a comfortable height and distance for viewing aids with posture and can reduce eye-strain. It also allows for the monitor to be pushed out of the desk space when not in use.



Footrests – can reduce the pooling of liquids in the lower limb caused by long periods of inactivity whilst sitting at a desk. They can encourage blood circulation, better posture and relieve stress on the lower back.

Copy Holders – allows for work to be positioned directly in front of a workstation eliminating the repetitive lateral head movement which can cause neck and upper back pain.



Ergonomic Mouse – allows the wrist and forearm to sit in a natural position and is recommended for people who use a mouse daily and for regular periods.

Laptop Holders – help reduce the ‘hunched’ position often associated with laptop use. It enables the user to adjust the height of the screen to a comfortable position, helping alleviate stress on the back of the neck.



Ergonomic Chairs – In order to reduce the risk of back injuries, weight over the spine should be kept even whilst sitting down in the same position for long periods of time. Specially designed chairs can allow for full extension of the spinal column, relaxation of the shoulders and thus freer movement of the arms.

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- ^{xiii} Still a pain in the back, *Usabilitynews.com*, (Apr 1, 2008), <http://www.usabilitynews.com/news/article4623.asp>