
Human Computer Interaction

Computing Induced Repetitive Strain Injury Preventative Measures

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Introduction

Computer is one of human greatest invention. With this creation, human is able to perform tasks that is sometimes deemed as extraordinary. Nowadays computer is pervasive throughout the world; there are a lot of people that is using it to automate tasks, augment process and as a tool for innovation.

Nevertheless, this invention also comes with its own undesirable consequences. Repetitive Strain Injury (RSI) is one of them. RSI is an injury that is usually related to prolonged computer use. These injuries can be permanent in the long term, affect the victim ability to do simple tasks such as holding a glass and so on.

There is a saying that says, "Prevention is better than cure". Therefore, it is vital that computer users adopt a prevention strategy against RSI.

Scope

This research paper is focusing on computer workstation setup and some of its environment. It does not apply to people with disabilities. However, there may be some method that these special people can employ. Furthermore, this research is not meant to be exhaustive since there is a limit we have to adhere.

Definition

Repetitive Strain Injury Association defines RSI as (RSIA 2003 – Definition): The term RSI is not, in itself, a medical diagnosis. It is used to describe a number of named musculoskeletal conditions (such as Cramp of the Hand, Tendonitis, etc.) as well as 'diffuse RSI' which is more difficult to define but which recent research attributes to nerve damage. These are almost always occupational in origin. 'Repetitive Strain Injury' is a term similar to that of 'sports injury' in that it tells more about how the injury was sustained, rather than what the injury actually is.

RSI conditions occur in both upper and lower limbs as well affecting the spine in various areas, which in turn can cause referred pain into the limbs, making diagnosis difficult. Symptoms of numbness, sharp pain, loss of ability to grip, weakness and restricted movement of limbs can render people incapable of carrying out the simplest of tasks, at home or at work. Lack of accurate diagnosis and access to appropriate treatment further exacerbates the condition, frequently resulting in job loss and economic deprivation.

Factors of RSI

Repetitive Strain Injury Association classifies two factors of RSI (RSIA 2003 – Primary and Secondary Factors): primary factors and secondary factors.

Primary Factors

Primary factors may include, ergonomically unsafe workstation, prolonged periods of work without adequate breaks, sustained overuse from too much repetitive movement, poor posture, excessive workload, patterns of work and a cold working environment.

Secondary Factors

Secondary causes of RSI may include (but are not limited to):

- Predisposition
 - Factors such as age, intrinsic strength, and general health, may all contribute to differing levels of tolerance to repetitive or prolonged strain in individuals.
- Stress
 - Stress makes muscles and soft tissues tense up, and when they tense up, they are more likely to be injured. Both physical and social stressors at work may contribute to this process

Risk Factors

According to Massachusetts Institute of Technology (MIT 2003), any combination of factors below can lead to RSI:

- Repetition: The repetition of small, rapid movements, such as keying or using mouse, for long concentrated hours
- Static posture: Holding the same position, especially an uncomfortable or awkward posture, for a long period of time
- Improper workstation setup: A workstation (table, chair) that cannot be adjusted to position you properly and comfortably at your computer or other work activity
- Force: Using excessive force to complete tasks
- Insufficient rest time: Intensive hours of working with too few rest breaks which allow your body to recover from an activity

Ways for Computer Users to Prevent Repetitive Strain Injury

Use alternative technology whenever possible

- Use alternative input and output devices that is more comfortable than standard equipment e.g. stylus and Liquid Crystal Display (LCD) monitor
- Use intelligent software that helps to automate and augment tasks e.g. Microsoft Word (template, Auto-Correct and Auto-Text)

Avoid mouse if possible

- Use keyboard shortcuts whenever possible
- Use software that helps user to click
- Move mouse pointer using arrow keys
- Reduce double click speed
- Switch mouse button according to preference i.e. left hander

Take frequent break and rest

- Take a 5 minutes break every 30-40 minutes to lightly stretch the joints and away from the monitor screen
- Use software that reminds user to take break e.g. RSIGuard
- Blink the eyes frequently to prevent dry eyes
- Use wrist rest during typing or using mouse

Configure workstation whenever possible

From RSIA 2003 (No cost computer tips);

- Slow down mouse pointer speed
- Increase screen resolution to 800 by 600 for 15 inch monitor or 1024 by 768 for 17 inch monitor
- Increase monitor refresh rate to 70 – 75 Hz or higher
- Use large fonts whenever possible
- Slow down keyboard repeat rate
- Use large icons in display
- Use Clear Type font (Microsoft Windows XP only)
- Use menu accelerator to improves keyboard usage
- Refer to Appendix – Workstation setup (RSIA 2003 – Correct and incorrect workstation setup factsheet)

Critical Appraisal

This research shows that simple actions such as the clicking of a mouse can affect human finger in a sometimes painful way. By doing this research, RSI risks are identified and ways to reduce or prevent them are also suggested.

Although the technology may be very exciting, it may be not safe for use in the long term. Therefore the correct techniques must be applied in order to reduce the risks of RSI. For this reason, nowadays hardware manufacturer are looking for ways to tackle RSI. Furthermore the software industry also playing their role in preventing RSI by developing insightful technology and programs that allowed user to work more comfortably.

This research also shows that moderation is a key to applying technology. Without moderation, computer users' life may be too occupied with this technology. Hence, their lives are affected in a way that can bring permanent disfigurement. In some reported cases, some users have actually lost their lives due to their overzealous character.

Conclusion

All in all, RSI can be reduced and prevented if users are aware of this danger and take precautionary step faithfully. Moderation in uses, takes frequent breaks and rests, proper setup of workstation and use of advance accessibility technology may be the solution to prevent RSI.

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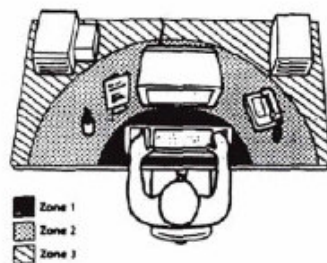
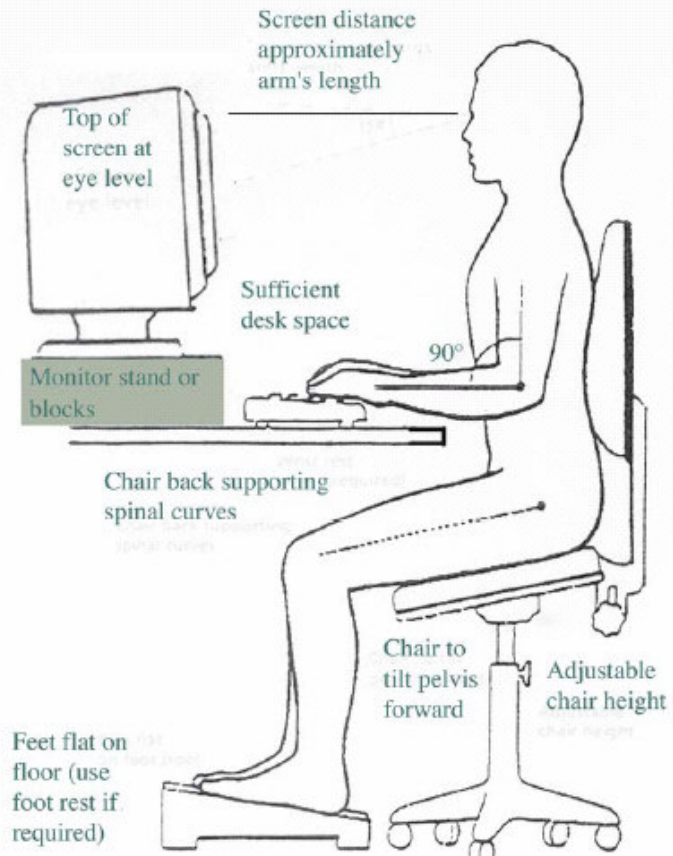
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Appendix – Workstation Setup



Organise your desk top so there is space in front of you for immediate tasks, and space for lower-priority items elsewhere.

