

# Significance of tablet computer usage position, potential for neck damage

March 13 2015

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Tablet use has rocketed. Last year in the US, for example, 42% of under 18's owned one and more than half of 35-49 year olds used them regularly. This figure seems unlikely to decrease and yet only limited guidance is available on minimising health risks. Tablet use requires significant head and neck flexion and has implications for potential neck injury to users. In this article in *Ergonomics*, researchers from Washington State University evaluate the head-neck biomechanics during tablet use, the implications for the neck musculature and future ergonomics recommendations.

Past research has highlighted a link between increased head and neck flexion and pain. Increased activation of neck extensor muscles leave them vulnerable to fatigue and therefore pain. It is not clear though if more risk is associated with type of computer, activity (web browsing, emailing etc.) or if differences in head mass, height and/ or neck muscle strength, often associated with gender, are pivotal.

The authors conducted a study of 33 university students and staff who use regularly used tablets. Users were tested in a variety of usage positions and whilst reading and typing for 2-5 minutes. Radiographs and a biomechanical model were used to assess gravitational demand on the neck and biomechanical ergonomics of the head-neck system during tablet use. The authors hypothesised that tablet use would result in greater gravitational demand than a neutral posture, particularly when used on a lap or flat on a desk. They also speculate that demand will be different for reading vs. typing and finally that gravitational demand will

be greater for female users.

Fascinatingly the authors discovered that tablet use increases mechanical demand on [neck muscles](#) by 3-5 times more than a neutral position. Using a tablet flat or on lap also had this effect as compared to propped up but whether subject was reading or typing had little effect on level of neck strain; head-neck demand is independent of hand position. A minimal increase in gravitational demand was seen in males but not enough to be significant. The authors conclude "Our findings are important for developing ergonomics guidelines for tablet computer use because they provide quantitative information about the mechanical requirements of the head–[neck](#) musculature, which are directly linked to mechanisms of pain-related problems, under several [tablet computer](#) usage conditions." They urge more research to include further variables such as extent and frequency of use and posture, all of which could be significant in inducing [neck pain](#) after [tablet](#) use.

**More information:** Gravitational demand on the neck musculature during tablet computer use, *Ergonomics*, [www.tandfonline.com/doi/full/10.1080/00140139.2015.1005166](http://www.tandfonline.com/doi/full/10.1080/00140139.2015.1005166)

Provided by Taylor & Francis

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