Publications are welcome but mechanisms underlying the effects of new technologies have yet to be delineated

We note with interest two recent articles in the *Journal of Physiotherapy* regarding the use of new technologies in clinical practice. We think this is an exciting field of research, illustrated by the growing number of published studies in this area (Piron et al 2009, Yavuzer et al 2008, Yang et al 2008, Chuang et al 2006). Results from several trials indicate that use of these technologies might improve physical outcomes when compared to conventional clinical rehabilitation (Piron et al 2009, Yavuzer et al 2008, Yang et al 2008, Chuang et al 2006).

Many research publications in this area are now freely available on websites. For example, www.wiihabilitation.co.uk has indexed over 80 articles published since the website was created in 2010. Whilst the amount of research activity in this area is impressive, recommendations about the clinical usefulness of these interventions should be interpreted with caution. Of all the abstracts of research articles indexed on the Wiihabilitation website, only two state they have used a randomisation process (Saposnik et al 2010, Wuang et al 2010). It is heartening to see trials, such as the one by Kuys and colleagues in the latest issue of *Journal of Physiotherapy*, using robust research designs (Kuys et al 2011). In addition, it is reassuring to see that a small number of randomised trials investigating clinical applications of gaming consoles have been registered on sites such as www.clinicaltrials.gov and www.anzctr.org.au. We look forward to publication of these trials. We encourage readers who are interested in the clinical effects of technology-related interventions to consider the research designs used in the studies they read. Furthermore, readers might consider searching for trials on sites such as PubMed and PEDro, where searches can be restricted to studies of appropriate research design such as randomised controlled trials.

Kuys and colleagues (2011) acknowledge that their assessment of the clinical effects of exercise with and without the use of a gaming console was limited to immediate cardiovascular demand and caution that further research into the use of this device for maintenance exercise is appropriate. It is also good to see some ‘tempering of the craze’ by the Editorial in the same issue of the journal (Russell and Jones 2011), which reviews the medico-legal implications of the use of new technologies in both clinical practice and research. This is particularly timely as preliminary research highlights possible adverse effects of long-term use of these types of devices, such as fatigue (Carey et al 2007) and shoulder pain (Hijmans et al in press). We encourage the international readership of the journal to investigate the relevant regulations in their own jurisdiction. We caution that the introduction of these new technologies into clinical practice should be judicious, as the mechanisms underlying their effects have yet to be delineated and possible adverse effects are yet to be examined using robust research designs.

**Cath Smith and Leigh Hale**

University of Otago, New Zealand

**Note**

Associate Professor Leigh Hale is Editor of *The New Zealand Journal of Physiotherapy*.

**References**


**Websites**

www.wiihabilitation.com
www.healthgamers.com
www.wiihabtherapy.blogspot.com
Was the effect of sitting time interpreted appropriately?

The recent study ‘Duration of physical activity is normal but frequency is reduced after stroke: an observational study’ (Alzahrani et al 2011) found that while community-dwelling stroke survivors took far fewer steps each day compared to age-matched controls, they spent a similar duration of time each day walking. This finding was both novel and interesting. However, I have some concerns about the conclusions drawn by the authors in regard to daily energy expenditure, sedentary behaviour, and the implications for risk of stroke.

Several large scale international epidemiological studies have found a substantial link between sitting for prolonged periods each day and negative changes in metabolic health, increased risk of all-cause mortality, and cardiovascular disease (Stamatakis et al 2011, Dunstan et al 2010). Importantly, these effects remain even when adjusted for other cardiovascular disease risk factors (Dunstan et al 2010). While research into the cause and effect of sitting time on cardiovascular disease risk is in its infancy, the epidemiological findings are convincing enough for the National Heart Foundation of Australia to have recently launched an information sheet recommending that people should aim to reduce the amount of time they sit each day (National Heart Foundation of Australia 2011). Alzahrani and colleagues suggest that, because the total duration of sitting time was similar between stroke survivors and age-matched controls, stroke survivors are no more at risk of recurrent stroke. This interpretation may be incorrect. First, it is not the total time spent in sedentary behaviour (sitting or lying) each day that is of primary importance, but the way in which this time is accumulated. Healy and colleagues (2008) found that breaking up sitting time with frequent, short bursts of light activity (such as standing and walking for a few minutes) was significantly associated with reduced cardiovascular disease risk. Importantly, this finding was independent of either total daily sitting time, or time spent in moderate to vigorous physical activity. The paper by Alzahrani et al (2011) reports that stroke survivors underwent few transitions (changes in body position) per day compared to controls. It would be of interest to know whether this means that stroke survivors sat for longer periods at a time and accumulated their active time in fewer bouts per day. If so, this may lead to an increased risk of cardiovascular disease, including further stroke.

Second, both the stroke survivors and control participants in this study accumulated more than seven hours of sedentary time during the day, which was more than half of the time they were observed. While we do not yet know how much sitting time is too much, sitting for seven hours a day, particularly if this time is accumulated in long bouts, may well be placing both stroke survivors and healthy people at an increased risk of cardiovascular disease. More research is needed to investigate how we can encourage stroke survivors to increase incidental daily activity levels in a sustainable way, and to determine if changes in sitting time behaviour will result in reduced cardiovascular disease risk for individuals.

Coralie English

Stroke Division, Florey Neuroscience Institutes, Melbourne, and School of Health Sciences, University of South Australia

Australia

References


We thank Dr English for her thoughtful comments on our paper (Alzahrani 2011). We agree that – given the similarly large amount of time spent in sedentary behaviours by both the stroke survivors and the age-matched controls – both may be at risk of cardiovascular events including stroke. Our point, which we stand by, was that stroke survivors appear to be no more at risk of recurrent stroke and cardiovascular events due to the amount of activity they do. This is reflected in our statement that, ‘This would mean that they were no more at risk of recurrent stroke and cardiovascular events due to low levels of physical activity than their healthy peers.’ It is certainly possible that they are more at risk due to the pattern in which that activity is accumulated, but we refrained from making strong statements about this possibility for two reasons. First, we did not measure the pattern of accumulation of sedentary time and can therefore only make indirect estimates about such patterns from our data about transitions. Second, the data about activity pattern and risk is from people without stroke and may not extrapolate to people with stroke.

We agree, nevertheless, with Dr English’s interpretation of how the evidence about sedentary behaviour might apply to our data. It is therefore interesting to consider what our data can reveal about this issue. Without reanalysis of the data, examination of transitions provides the best insight into the differences between stroke survivors and healthy controls in terms of bouts of activity. The transitions we recorded included lie to sit, sit to lie, recline to sit, sit to recline, recline to stand, stand to recline, sit to stand and stand to sit. Despite this comprehensive measurement of transitions, the amount of time spent making transitions was very small in both groups, with a mean of 1 min in the stroke group and 2 min in the control group. Although this difference was statistically significant (mean between-group difference 1 min, 95% CI 0.3 to 2), this difference was also very small. This suggests that the sedentary behaviour was likely to be accumulated in long bouts by both groups, putting both groups at risk of cardiovascular disease. We strongly agree with Dr English that further research is needed to understand the influence of the pattern of accumulation of sedentary time in stroke survivors. We welcome future findings in this important area.

Catherine Dean, Louise Ada and Matar Alzahrani
Discipline of Physiotherapy, Faculty of Health Sciences,
The University of Sydney, Australia

Reference