The aim of this study was to investigate if increasing cardiovascular demand during treadmill walking adversely affected gait in stroke patients able to walk. Eighteen subjects undergoing rehabilitation walked at predetermined heart rates equivalent to 30%, 40%, 50% and 60% heart rate reserve, the minimum intensity capable of improving cardiorespiratory fitness. Main outcomes were kinematic gait variables and visual analysis of walking quality. A 2D posterior and lateral webcam system was used to record 10 gait cycles at each cardiovascular demand during treadmill walking. Spatial-temporal and kinematic measures were taken at stance and swing phases of gait, and visual gait analysis used the Wisconsin Gait Scale and a visual analogue scale. Additional spatial-temporal measures were taken pre and post treadmill walking over an 8m Gaitrite mat. An increased step length was found for both paretic (0.06m) and nonparetic (0.09m) limbs walking on the treadmill at 60% compared to 30% demand ($p < 0.01$). Greater hip ($3^\circ$) and knee ($4^\circ$) flexion during mid-stance ($p < 0.01$) and increased knee flexion ($4^\circ$) at toe-off ($p = 0.02$) was also found at 60% compared to 30% demand. No differences were found for other variables. Visual gait analyses showed no difference across the demand levels. Treadmill walking at increasing cardiovascular demands results in some favourable and unfavourable differences in gait spatial-temporal and kinematic variables although these differences were not detectable using visual scales. It is feasible to use treadmill walking during inpatient rehabilitation to retrain walking capacity in stroke patients able to walk without compromising gait quality.

Is amount of physical activity undertaken in the community after stroke dependent on walking ability?

Alzahrani M, Ada L and Dean C
University of Sydney

The aim of this study was to examine whether the amount of physical activity undertaken by people living with stroke is determined by their walking ability. A prospective descriptive study was carried out on community-dwelling people who were over 50 years old, between 1–5 years of first ever stroke, and who were able to walk 10 m in bare feet independently. Walking ability was measured as velocity during 10 m walk test in minutes and distance during the 6-minute walk test in metres. Physical activity was measured using an activity monitor (the Intelligent Device for Energy Expenditure and Activity) as number of steps taken, distance covered, and calories expended. Physical activity was measured over 2 days that were randomly allocated. Participants were instructed to follow their normal daily routine. Data were analysed using simple linear regression to examine the relationship between walking ability and physical activity. The relation between walking ability and physical activity ranged from $r = -0.51$ to $0.10$, $p = 0.30–0.95$. In other words, the amount of physical activity undertaken may be determined by factors other than walking ability. These factors will be explored in a subsequent study.

Keeping patients in clinical trials: how was it done?

Quah D, Collier JC, Purvis T and Bernhardt J
1,3
1National Stroke Research Institute, Melbourne 2Austin Health, Melbourne 3School of Physiotherapy, La Trobe University, Melbourne

All high quality clinical trials aim to retain at least 85% of recruited patients through to follow-up. This was a key objective when conducting A Very Early Rehabilitation Trial (AVERT) for stroke patients, a pilot multi-centre, randomised controlled trial. Between March 2004 and Feb 2006, 71 patients admitted within 24 hours of confirmed stroke presenting to two metropolitan stroke units were recruited. Subjects were randomised into either very early rehabilitation ($n = 38$) or routine care ($n = 33$). Forty-six percent required third-party consent. Early rehabilitation provided by a physiotherapist/nurse team, commenced day zero and continued for up to 14 days. Assessments were conducted by a blinded assessor at days 7, 14 and 3, 6 and 12 months. Assessments were completed at face-to-face interviews in 95% of cases. Although 17 patients died by 12 months follow-up (a trial outcome), only 2 patients were lost to follow-up at 12 months post stroke, resulting in a 97% retention rate. In addition to the use of face-to-face assessments, strategies that we believe contributed to these excellent retention rates include: recording of subjects’ contact details, contact details of their GP, and those of a friend/relative not living with them. Dedicated trial staff ensured that consenting patients and their families had a clear understanding of trial commitments; helped optimise research-patient rapport; maintained flexible assessment times and organised follow-ups at locations to best suit the patients and their families. Unlike many clinical trials, these results indicate that high retention rates can be achieved.

Measuring the normal balance responses to galvanic vestibular stimulation in standing postures that involve the upper limb

McLoughlin JV, Mochova M and Day BL
1Department of Rehabilitation and Aged Care, Flinders University, Adelaide 2Sobell Department of Motor Neuroscience and Movement Disorders, Institute of Neurology (Queen Square), University College London, London, London, United Kingdom

Galvanic vestibular stimulation (GVS) is a technique of applying a small percutaneous electrical stimulus behind the ears to modulate firing of vestibular afferents. In normal subjects, the standing postural response to this stimulus is a compensatory body sway in the direction of the anodal ear. The aim of this study is to measure the whole-body motor behaviour to GVS in standing positions that involve the upper limb. We investigated 15 normal subjects in 5 different standing conditions, analysing body sway distance and velocity via infrared markers. Feet and hand forces were also measured via force plates and force handles. In all 5 standing positions there was a GVS-evoked lateral postural response. Results reveal significant changes in the whole body response when comparing positions. We can confirm that the upper limb can be included as part of the functional