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Physiotherapy management of people with spinal cord injuries: the essentials

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The primary aim of physiotherapy for people with SCI is to help individuals attain optimal levels of independence with mobility and activities of daily living. There are five steps involved in planning and implementing an appropriate physiotherapy programme regardless of a patient's stage of rehabilitation. They are: assessing impairments, activity limitations and participation restrictions; setting goals; identifying key problems amenable to physiotherapy; administering treatments; and measuring outcomes. Often the most difficult step for physiotherapists not familiar with SCI is setting goals. This is difficult because it requires an understanding of what patients can be expected to achieve. This of course varies depending on a number of factors but most importantly on neurological status. Identifying key problems amenable to physiotherapy can also be a challenging step for physiotherapists inexperienced in SCI. It requires an understanding of the evidence base for different therapeutic approaches. The best evidence about appropriate treatments comes from randomised controlled trials and systematic reviews. We are still in the early stages of building high-quality evidence but there is reasonable evidence to support the use of physiotherapy to treat 6 key impairments. These are: lack of strength; lack of dexterity and skill; poor respiratory function; limited cardiovascular fitness; restricted range of motion; and pain. There is also emerging evidence to support new and novel therapeutic approaches which include the use of robotics. However, as we move forwards it will be important to ascertain the cost-effectiveness of new interventions before advocating for their widespread rollout to the public.

Experiences of hospital based physiotherapists involved in conducting their own research project.

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We aimed to explore the experiences of hospital based physiotherapists as they engaged in academic research, using a participatory action research (PAR) approach. In recent decades the need for research has become more prominent in the physiotherapy profession; however, few clinical physiotherapists conduct research. In this study a PAR approach was used to stimulate clinical physiotherapists to work together in groups on their own research projects for one year. A qualitative case study design underpinned by a pragmatic paradigm was used. Data were collected from three different sources: semi-structured in-depth interviews, reflections within the PAR groups, and field notes. These qualitative data were analysed and triangulated using a thematic approach. Twenty-five of the 32 registered physiotherapists working in one rehabilitation hospital consented to participate (mean age: 38 years (standard deviation of 11 years)). Fourteen of the 25 physiotherapists became involved in one of the three PAR projects (n=3, 8, 3). Thematic analysis revealed three factors as influencing the experience of these clinical physiotherapists: 1) positive relationships between colleagues and management; 2) transparent structure and roles; and 3) positive perceptions and attitudes of clinicians in the group towards research. Despite the small sample size and the use of one hospital, the results indicate that clinical physiotherapists, working collaboratively, can successfully conduct research. If the physiotherapy profession wants to become more research active, it could adopt a PAR approach to increase the research capacity of clinical physiotherapists and thereby increase the evidence for clinical practice.

Postural responses in traumatic and dysvascular transtibial amputees: A pilot investigation

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The purpose of this study was to objectively investigate and compare postural responses under normal and altered sensory environmental conditions in traumatic and dysvascular amputees. Six traumatic and six dysvascular community-dwelling amputees (age > 60 years) completed three trials of the 6 Sensory Organisation Test (SOT) conditions on the NeuroCom Smart Equitest®. The six SOT conditions were standing with: eyes open on stable platform and surround; eyes closed on stable platform and surround; eyes open on stable platform and movable surround; eyes open on movable platform and stable surround; eyes closed on movable platform and stable surround; eyes open on movable platform and surround. Variables of interest were: equilibrium score (ES), a percentage measure of balance performance; strategy score (SS), a percentage measure of the trend in strategy employed; and composite score (CS), an overall weighted average of the equilibrium scores of all 6 conditions. A significant difference (Mann-Whitney U, $p < 0.05$) was observed between traumatic and dysvascular amputees in the SSs of conditions 2 (90.1 SD 7.3; 78.5 SD 10.3), 4 (85.6 SD 4.8; 78.1 SD 4.3) and 6 (75.5 SD 7.7; 62.4 SD 9.6) whereas no statistical difference was observed for other SSs, ESs (6 conditions) and CS. Postural strategies (SS) employed by dysvascular amputees are different from their traumatically injured counterparts when the visual/somatosensory input are challenged. Clinically, these results indicate the need for tailored balance rehabilitation protocols for dysvascular amputees rather than assuming all lower limb amputees have equivalent balance ability. Discrepancies in balance performance may persist beyond the early rehabilitation phase.

Research informed practice: Therapeutic exercise for cervical disorders

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Neck pain disorders are variously associated with changes in the neuromuscular system of the cervical and axio-scapular regions, including re-organization of motor control strategies. There is evidence of reduced activity in the deep cervical muscles associated with heightened activity in the superficial muscles, increased co-activation of the neck flexors and extensors, altered feedforward and feedback responses. The neck muscles also lose strength and become more fatigable. Research informs

the need for a comprehensive examination of neuromuscular function of the neck pain patient. Research also informs a multimodal exercise program in rehabilitation, addressing altered muscle behaviours with motor relearning programs and strength and endurance training. Questions that now require concerted attention are dosage of exercise and endpoint of rehabilitation. Most clinical trials use self reported changes in pain/disability as the primary outcome, but pain relief does not provide any certainty that optimal muscle function has been restored. The course of neck pain is characterized by recurrent episodes over a lifetime. These factors suggest that attention of both clinicians and researchers alike should focus not only on pain relief but on prevention of recurrence. Firstly, more work is needed to determine what dosage of exercise is required to restore normal muscle function and secondly, evidence is required that restoring and maintaining normal muscle function impacts positively on recurrence rate. If evidence is provided, translational research is required to change the ethos of clinical trialists, clinicians, patients and health insurers to prevention of recurrences as a primary outcome together with relief of pain/disability.

Is dual-task performance a useful measure for the assessment of a sports-related concussion? A systematic review and meta-analysis

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There is a growing interest in the field of Physiotherapy in the understanding of a person's ability to perform two tasks simultaneously. Termed dual-task (DT) performance, this skill represents the ability to perform a cognitive task while executing a motor task such as walking. The purpose of this study was to review the literature, and conduct a meta-analysis if appropriate, on the use of the DT paradigm in the assessment of persons with a concussion. Electronic databases (Scopus, PsycINFO, MEDLINE, CINAHL, AMED, SPORTDiscus, Web of Science, and PubMed) were searched in April 2011 by combining search terms related to concussion and DT. The methodological quality of the studies was assessed using the modified Downs and Black scale. Raw mean differences (MD; 95% CIs) were calculated and DT deficits were pooled using a random effects model for the meta-analysis. From the 514 identified studies, 10 met the inclusion criteria. The meta-analysis demonstrated that DT performance deficits were detected ($p < 0.05$) in the concussed group for gait velocity (GV) (MD=-0.133; -0.197, -0.069) and medial-lateral sway of the centre of mass (ML-ROM) (MD=0.007; 0.002, 0.011), but not in the non-concussed group; GV (MD=-0.048; -0.101, 0.006), ML-ROM (MD=0.002; -0.001, 0.005). The results of this study indicate that GV and ML-ROM are sensitive measures of DT related changes in concussed persons and should be further explored as part of a comprehensive assessment of persons with a sports related concussion.