

Guest Editorial — International collaboration in physiotherapy management of people with stroke

In many countries in the world, physiotherapy colleagues are making efforts at improving the quality of physiotherapy management in stroke care. Sharing our knowledge about the most effective physiotherapy interventions for people with stroke, current physiotherapy clinical stroke guidelines and the most optimal stroke research designs, can offer the opportunity to improve the quality of physiotherapy stroke management worldwide. This editorial will inform the readers of *Physiotherapy Research International* about the aim for more global physiotherapy collaboration in stroke care and in sharing the developments and gaps in the evidence relating to physiotherapy stroke management.

Physiotherapists involved in stroke management need to consider interventions according to critically appraised evidence stemming from physiotherapy and physiotherapy-related studies in individuals with stroke. As of recent years, the importance of evidence-based practice (EBP) as a guide for the clinical decision-making process is increasingly being recognized by physiotherapists (Holm, 2000; Parker-Taillon, 2002). Although EBP, in this century, has become the standard for integrating patients' preferences, clinical expertise of the professionals and research evidence into daily

practice, and many interventions are underpinned with evidence, there are still a considerable number of gaps in the research area of stroke rehabilitation.

Since the advances of science in recent decades and the gradual understanding of neurophysiological principles in movement control, new concepts about the optimal physical treatment strategy for movement disorders in individuals with brain damage have been developed resulting in new physiotherapy approaches. To date, there have been a limited number of systematic reviews carried out on different physiotherapy approaches for stroke. In clinical practice and professional debates, physiotherapists still disagree about the most effective approach to use in stroke rehabilitation. A recent Cochrane systematic review (Pollock et al., 2007) critically appraised and reviewed the literature about the effects of physiotherapy treatment approaches aimed at promoting postural control and lower limb function, such as Bobath/neurodevelopmental treatment (NDT), Brunnstrom, Proprioceptive Neuromuscular Facilitation and Motor Relearning Programme. They explored whether there was any difference in functional independence depending on which physiotherapy approach the individual received. Pollock and

colleagues concluded that currently no evidence exists that one physiotherapy approach is superior in promoting recovery of disability after stroke. A mix of components from different approaches, an eclectic approach, seems to be more effective than no treatment or placebo control in attaining functional independence following stroke (Pollock et al., 2007). This Cochrane conclusion seems to suggest that the main evidence relates to intensity of treatment rather than one particular approach to treatment. Physiotherapists should therefore be encouraged to find ways of integrating these findings into their daily practice. To date, about 80% of Dutch physiotherapists in stroke management have used the principles of the NDT approach (Hafsteinsdottir et al., 2005), which is also comparable to that of colleagues in Sweden (Nilsson and Nordholm, 1992), Australia (Carr et al., 1994), and the UK (Davidson and Waters 2000; Lennon et al., 2001). In my opinion, the underpinning of physiotherapy stroke management has to be focused on existing evidence rather than these now outdated philosophies, many of which focus only on impairment. To dogmatically apply impairment-focused treatment approaches could result in a longer length of stay for individuals with stroke, as the physiotherapist endeavours to gain a certain quality of movement prior to functional mobility training. In the Netherlands, we have now achieved consensus that there is a lack of evidence to support the use of NDT concept after stroke, this has resulted in a new research program in which NDT teachers are educated how to apply the evidence-based guidelines into practice, how to measure change and how to estimate prognosis in persons with stroke. Following this, in 2007, the Dutch NDT teachers altered their name to 'Neurorehabilitation-CVA' to

reflect change in emphasis and aims of the new training programs.

More recently, the 'best evidence' for stroke management, derived from methodologically sound clinical research, has been collected in systematic reviews and converted into several multidisciplinary stroke guidelines (Agency for Health Care Policy and Research, 1995; Royal College of Physicians — The Intercollegiate Working Party for Stroke, 1999; Dutch Institute for Quality in Health Care, 2000; Commissie CVA-Revalidatie, 2001; Scottish Intercollegiate Guidelines Network, 2002; Hanger et al., 2004; National Stroke Foundation, 2005; Khadilkar et al., 2006). However, these clinical practice guidelines, commonly defined as 'systematically developed statements to assist practitioners and patient decisions about appropriate healthcare for specific clinical circumstances' (Field and Lohr, 1992), do not review in-depth all available evidence with regard to physiotherapy practice. Physiotherapists still need to have more detailed information to foster and enrich their clinical decisions where it concerns valid functional prognosis, designing the most effective intervention program and selecting the most appropriate measures to evaluate functional outcome.

Many international physiotherapy associations already state that assessing and monitoring the health status of patients is considered an aspect of good clinical practice in physiotherapy (American Physical Therapy Association, 2001; Australian Physiotherapy Association, 2003). However, up to 2005, no specific guidelines about which aspects of health status that concern physiotherapy in the management of persons with stroke were published, even though physiotherapy accounts for a substantial proportion of the total therapy time provided by stroke rehabilitation services ranging from

44 to 90% (De Wit et al., 2005; Jette et al., 2005). Clearly a detailed, evidence-based clinical practice guideline for physiotherapy management of persons with stroke was needed. The Clinical Practice Guideline for Physiotherapy-Management of Patients with Stroke (CPGPS), has now been published in The Netherlands (Van Peppen et al., 2004). The CPGPS recommended physiotherapists to train persons with stroke intensively and in a task- and context-specific manner. Meanwhile, the CPGPS, the first physiotherapy-specific stroke guideline worldwide, was recently translated in English (Van Peppen et al., 2007a) and German (Van Peppen et al., 2007b). The CPGPS states 72 recommendations and offers physiotherapists detailed information about 1) prediction of functional recovery of activities of daily living, including walking ability and hand/arm use, 2) selection of cost-effective physiotherapy interventions, and 3) selection of relevant outcome measures, of which seven are to be seen as a minimal optional base, to determine impairments and activity limitations. Besides these, the Royal College of Physicians published a compilation of the physiotherapy elements of the UK multidisciplinary stroke guideline (Hammond et al., 2005).

As previously mentioned, we all need to share our knowledge about the most effective physiotherapy interventions and recommendations from physiotherapy clinical stroke guidelines. These clinically relevant outcomes are beneficial for the profession of physiotherapists and address the demand for more understanding of the underlying mechanisms of recovery after stroke. We also need to gain more insight into *how* exactly an individual with stroke learns when showing improvement in motor performance. An example of this, based on recent studies, relates to a change in the

assumption of 'normal motor behaviour' as a common reference to describe the 'abnormal' asymmetric motor behaviour of people with stroke (Latash and Anson, 1996; Buurke, 2005). We now know that asymmetrical weight transfer in individuals with stroke does not necessarily imply that these persons are more unstable and less able to control their balance in order to prevent falling (Sackley, 1991; de Haart, 2005). Based on results of systematic studies of the effects of 'visual feedback therapy' on postural control in bilateral standing in people with stroke (Barclay-Goddard et al., 2004; Van Peppen et al., 2006), we can conclude that training symmetry in weight distribution while standing on balance equipment tools fails to generalize to more effective control when walking. For example, improvement in control of standing balance occurs without significant changes in EMG activation on the paretic side (Garland et al., 2003) or weight bearing on the paretic leg (de Haart, 2005). In addition, for regaining gait control Kautz et al. (2005) as well as Buurke (2005) found that therapy-induced improvements in gait speed and walking ability occur without significant changes in EMG timing of the paretic leg while walking. Longitudinal research also shows that improvement of walking ability is only weakly associated with observed changes in strength and synergism of the paretic leg (Kollen et al., 2005) and that recovery of hand orientation for grasping with the paretic upper limb strongly depends on adaptive trunk movements in the event of distal deficits (Cirstea and Levin, 2000). On the basis of this clinically relevant evidence, it now seems invalid for physiotherapists to continue to strive for 'normal motor behaviour' during the treatment of persons with stroke. In other words, normal movement characterized by symmetry in weight bearing (de

Haart, 2005) and arm and leg swing while walking (Kwakkel et al., 2002), may not serve as an appropriate reference for the treatment of hemiplegic patients with stroke if incomplete recovery is expected. In contrast, it suggests that persons with stroke can continue to adapt to their existing deficits while showing functional improvement in gait or upper limb performance. Unfortunately, previous neurological approaches, such as Bobath, Johnstone and Affolter, have characterized these behavioural movement strategies as pathologic, and recent research now suggests that these adaptations may in fact be optimal for the state of independent movement control (Kwakkel et al., 2004).

In order to optimize clinical stroke management, education and research, we all need to encourage international cooperation and collaboration in physiotherapy research. We can achieve this by updating clinical practice guidelines and exchanging and disseminating knowledge and ideas in the field of physiotherapy stroke management. International and multidisciplinary collaboration in guideline development is advisable because many countries and professions pass through the same processes and debates during their development but at different phases (Van der Wees et al., 2007). In fact, the aim to improve healthcare decision-making process globally has been started already by the Cochrane Collaboration. They combined forces in systematic literature searches, methodological quality ratings and grading levels of evidence. However, cultural and national care specific differences between countries in the formulations of recommendations for clinical practice will always remain (South African Medical Association [Neurological Association of South Africa Stroke Working Group], 2000). Therefore, the foundation of a global network for stroke neurorehabilitation is crucial for

an efficient worldwide cooperation, aiming to enable and advance national organizations within neuroscience physiotherapy and their individual members by supporting and facilitating research, sharing clinical specialization, and selecting core sets of measurement instruments. Recently, during the World Confederation for Physical Therapy in Vancouver in June 2007, the initiative was taken by an international group of physiotherapists from the UK, Canada, the USA, Canada, Australia, South Africa and the Netherlands. The current working title for this new association is the International Neuroscience Physiotherapy Association. This association aims to facilitate communication and collaboration among neuroscience physiotherapists throughout the world and to promote the physiotherapy perspective within the sphere of neuroscience, for example questioning previous assumptions about 'normal motor behaviour' as a reference to describe the 'abnormal' asymmetric motor behaviour. Furthermore, the association aims to promote high-quality research with a diversity of methodologies, which will inform the practice of neuroscience physiotherapy and to support the progression of neuroscience physiotherapy in developing countries.

In 2008, an association name has to be formulated and the mission, vision and objectives have to be published. I look forward to being part of this association and to collaborate with my international colleagues with a special interest in neuroscience. This global collaboration of neuroscience physiotherapists is committed to excellence in neuroscience physiotherapy in research, education and clinical practice. Physiotherapy as a crucial part of stroke management is a profession with a relatively young history and with many challenges for further growth in the future.

REFERENCES

- Agency for Health Care Policy and Research. Post-Stroke Rehabilitation: Clinical Practice Guideline, No. 16. Rockville, MD: AHCPR Publication 95-0662, 1995.
- American Physical Therapy Association. Guide to physical therapist practice. Second edition. *Physical Therapy* 2001; 81 (1): 9–746.
- Australian Physiotherapy Association. APA Position Statement — Clinical Justification and Outcome Measures. 2003. (Available at: https://apa.advsol.com.au/staticcontent/staticpages/position_statements/public/ClinicalJustification&Outcome%20Measures.pdf, accessed 27 December 2007.)
- Barclay-Goddard R, Stevenson T, Poluha W, Moffatt ME, Taback SP. Force platform feedback for standing balance training after stroke. *Cochrane Database Systematic Reviews* 2004; October 18 (4): CD004129.
- Buurke JH. *Walking After Stroke, Co-Ordination Patterns and Functional Recovery*. Universiteit Twente, 2005. Enschede, The Netherlands, ISBN: 90-365-2140-8.
- Carr JH, Mungovan SF, Shepherd RB, Dean CM, Nordholm LA. Physiotherapy in stroke rehabilitation: a basis for Australian physiotherapists' choice of treatment. *Physiotherapy Theory and Practice* 1994; 10: 201–209.
- Cirstea MC, Levin MF. Compensatory strategies for reaching in stroke. *Brain* 2000; 123 (Pt 5): 940–953.
- Commissie CVA-Revalidatie. *Rehabilitation After a Stroke, Guidelines and Recommendations for Health Care Professionals [Revalidatie na een beroerte: richtlijnen en aanbevelingen voor zorgverleners]*. Den Haag, The Netherlands: Dutch Heart Foundation [Nederlandse Hartstichting], 2001.
- Davidson I, Waters K. Physiotherapists working with stroke patients: a national survey. *Physiotherapy* 2000; 86: 69–80.
- de Haart M. *Recovery of Standing Balance in Patients with a Supratentorial Stroke*. Nijmegen, The Netherlands: Radboud Universiteit Nijmegen, 2005. Nijmegen, The Netherlands, ISBN: 90-9019466-5
- De Wit L, Putman K, Dejaeger E, Baert I, Berman P, Bogaerts K, Brinkmann N, Connell L, Feys H, Jenni W, Kaske C, Lesaffre E, Leys M, Lincoln N, Louckx F, Schuback B, Schupp W, Smith B, De Weerd W. Use of time by stroke patients: a comparison of four European rehabilitation centers. *Stroke* 2005; 36 (9): 1977–1983.
- Dutch Institute for Quality in Health Care [Dutch: Kwaliteitsinstituut voor de gezondheidszorg Utrecht-CBO-]. *CBO Richtlijn Beroerte [Stroke Guidelines 2000]*. Den Haag, The Netherlands: Nederlandse Hartstichting, 2000.
- Field MJ, Lohr KN. *Guidelines for Clinical Practice. From Development to Use*. Washington, DC: National Academy Press, 1992.
- Garland SJ, Willems DA, Ivanova TD, Miller KJ. Recovery of standing balance and functional mobility after stroke. *Archives of Physical Medicine and Rehabilitation* 2003; 84 (12): 1753–1759.
- Hafsteinsdottir TB, Algra A, Kappelle LJ, Grypdonck MH. Neurodevelopmental treatment after stroke: a comparative study. *Journal of Neurology, Neurosurgery and Psychiatry* 2005; 76 (6): 788–792.
- Hammond R, Lennon S, Walker MF, Hoffman A, Irwin P, Lowe D. Changing occupational therapy and physiotherapy practice through guidelines and audit in the United Kingdom. *Clinical Rehabilitation* 2005; 19 (4): 365–371.
- Hanger HC, Wilkinson T, Keeling S, Sainbury R. New Zealand guideline for management of stroke. *New Zealand Medical Journal* 2004; 117 (1192): U863.
- Holm M. Our mandate for the new millennium: evidence based practice. *The American Journal of Occupational Therapy* 2000; 54: 575–585.
- Jette DU, Latham NK, Smout RJ, Gassaway J, Slavin MD, Horn SD. Physical therapy interventions for patients with stroke in inpatient rehabilitation facilities. *Physical Therapy* 2005; 85 (3): 238–248.
- Kautz SA, Duncan PW, Perera S, Neptune RR, Studenski SA. Coordination of hemiparetic locomotion after stroke rehabilitation. *Neurorehabilitation and Neural Repair* 2005; 19 (3): 250–258.
- Khadilkar A, Phillips K, Jean N, Lamothe C, Milne S, Sarnecka J. Ottawa panel evidence-based clinical practice guidelines for post-stroke rehabilitation. *Topics in Stroke Rehabilitation* 2006; 13 (2): 1–269.
- Kollen B, Van de Port I, Lindeman E, Twisk J, Kwakkel G. Predicting improvement in gait after stroke: a longitudinal prospective study. *Stroke* 2005; 36 (12): 2676–2680.
- Kwakkel G, Kollen BJ, Wagenaar RC. Long term effects of intensity of upper and lower limb training after stroke: a randomised trial. *Journal of Neurology, Neurosurgery and Psychiatry* 2002; 72 (4): 473–479.

- Kwakkel G, Kollen B, Lindeman E. Understanding the pattern of functional recovery after stroke: facts and theories. *Restorative Neurology and Neuroscience* 2004; 22 (3–5): 281–299.
- Latash ML, Anson JG. What are ‘normal movements’ in atypical populations? *Behavioral and Brain Science* 1996; 19: 55–106.
- Lennon S, Baxter D, Ashburn A. Physiotherapy based on the Bobath concept in stroke rehabilitation: a survey within the UK. *Disability and Rehabilitation* 2001; 23 (6): 254–262.
- National Stroke Foundation. *Clinical Guidelines for Stroke Rehabilitation and Recovery* (Australian Government), 2005.
- Nilsson LM, Nordholm LA. Physical therapy in stroke rehabilitation: basis for Swedish physiotherapists’ choice of treatment. *Physiotherapy Theory and Practice* 1992; 8: 49–55.
- Parker-Taillon D. CPA initiatives put the spotlight on evidence-based practice in physiotherapy. *Physiotherapy Canada* 2002; 24: 12–15.
- Pollock A, Baer G, Langhorne P, Pomeroy V. Physiotherapy treatment approaches for the recovery of postural control and lower limb function following stroke: a systematic review. *Clinical Rehabilitation* 2007; 21 (5): 395–410.
- Intercollegiate Working Party for Stroke, *National Clinical Guidelines for Stroke*. London: Royal College of Physicians of London, 1999.
- Sackley CM. Falls, sway, and symmetry of weight-bearing after stroke. *International Disability Studies* 1991; 13 (1): 1–4.
- Scottish Intercollegiate Guidelines Network. *Management of Patients with Stroke, Rehabilitation, Prevention and Management of Complications and Discharge Planning — A National Clinical Guideline* (No. 64). Edinburgh: SIGN 2002.
- South African Medical Association (Neurological Association of South Africa Stroke Working Group). *Stroke therapy clinical guideline*. South African Medical Journal 2000; 90 (3 Pt 2): 276–279, 292.
- Van der Wees PJ, Hendriks EJ, Custers JW, Burgers JS, Dekker J, de Bie RA. Comparison of international guideline programs to evaluate and update the Dutch program for clinical guideline development in physical therapy. *BMC Health Services Research* 2007; 7 (1): 191.
- Van Peppen RPS, Kwakkel G, Harmeling BC, Kollen BJ, Hobbelen JSM, Buurke JH, Halfens JHC, Wagenborg L, Vogel MJ, Berns M, Van Klaveren R, Hendriks HJM, Dekker J. Clinical practice guideline in physiotherapy-management of patients with stroke [KNGF-richtlijn Beroerte]. *Ned.Tijdschr.v Fysioth.* 2004; 114 (Suppl 5): 1–78.
- Van Peppen RP, Kortsmit M, Lindeman E, Kwakkel G. Effects of visual feedback therapy on postural control in bilateral standing after stroke: a systematic review. *Journal of Rehabilitation Medicine* 2006; 38 (1): 3–9.
- Van Peppen RPS, Hendriks HJM, Van Meeteren NLU, Helders PJM, Kwakkel G. The development of a clinical practice stroke guideline for physiotherapists in The Netherlands: a systematic review of available evidence. *Disability Rehabilitation* 2007a; 29 (10): 767–783.
- Van Peppen RPS, Kwakkel G, Wood-Dauphinee S, Hendriks HJM, Van der Wees PJ, Dekker J. Einfluss der Physiotherapie auf das funktionelle Outcome nach Schlaganfall: Evidenzen. In: Dettmers C, Bülau P, Weiller CH (eds), *Schlaganfall Rehabilitation*. Bad Honnef, Germany: Hippocampus Verlag, 2007b; 137–174.

Roland PS Van Peppen
Physiotherapists and
Human Movement Scientist
Staff Member Educational Innovation,
Senior Lecturer and Researcher
Department of Physiotherapy
University of Applied Sciences Utrecht