# Symapse

- Task specific training of sit to stand in acute stroke
- Exploring functional recovery of the upper limb
- Does 'stop standing' improve reach for function in sitting?
- The relationship between stroke patients involvement in goal setting and their participation in physiotherapy





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#### ACPIN'S AIMS

- To promote and facilitate collaborative interaction between ACPIN members across all fields of practice including clinical, research and education.
- 2. To promote evidence informed practice and continuing professional development of ACPIN members by assisting in the exchange and dissemination of knowledge and ideas within the area of neurology.
- To provide encouragement and support for members to participate in good quality research (with a diversity of methodologies) and evaluation of practice at all levels.
- **4.** To maintain and continue to develop a reciprocal communication process with the Chartered Society of Physiotherapy on all issues related to neurology.
- 5. To foster and encourage collaborative working between ACPIN, other professional groups, related organisations ie third sector, government departments and members of the public.

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# FROM THE CHAIR

#### Well hello from across the sea!

I feel delighted and honoured to have become the Chair of ACPIN in March and with Gita Rhamdharry as the Vice Chair and three new executive committee members look forward to continuing the success of ACPIN.

However it is bittersweet. as it is also a time to wish a fond farewell to cochairs Jo Tuckey and Cherry Kilbride! They were not only a superb double act in professionally leading ACPIN forwards over the last two years but also injected a great sense of camaraderie and fun to all our meetings and events. Likewise, farewell to Louise Rogerson, who with Jo and Cherry has contributed greatly to the Executive Committee over many years. But like those before them they don't get the chance to escape completely and we will continue to rely on them for advice and their continuing commitment to ongoing projects!

But we are also in the enviable position of welcoming three new members to the committee: Anita Watson, Lisa Knight and Joanne McCumisky.

By the time you read this ACPIN will have again produced the neurology

strand at the CSP conference which was very successfully organised and coordinated by Chris Manning. The founder lecture was given this year by Alistair Campbell who kindly took the time to contribute to Synapse in 'Five minutes with...' on page 35.

This year our one day conference will be held in Northampton on 19 March, entitled 'Brain over Body'. Keep checking the website for updates and I look forward to seeing you all there!

The success of ACPIN over the last few years has ensured that we have a very healthy bank balance and as our commitment is to all our membership we are looking for your suggestions as to how you feel the membership would most benefit from this over the next few years. A subgroup has been established to explore any suggestions so if you have any ideas please forward them to your regional representatives and they can be taken to the committee.

Thank you for all your support and look forward to hearing from you and seeing you all in Northampton.

Siobhan

# PRESIDENT'S ADDRESS The place of history in moving forwards...

Margaret Mayston AM FCSP PhD

I am currently in Melbourne where we have just had a national election-like Britain the outcome here was a hung parliament. The incumbent party's campaign slogan was 'Moving Forward'. While I am now rather tired of hearing that phrase, it also reminded me that our profession needs to keep moving forward to enable the people whom we treat and manage to optimise their activity and participation in the face of neurodisability, whether it be acute or chronic. As I write, the national congress is rapidly approaching and as usual ACPIN has organised an excellent programme, which, by the time you read this, will be history.

On the theme of history, it seems to me that is usually helpful and interesting - even enlightening - to know how we have arrived where we are now in terms of civilization and specific areas of knowledge, and in particular, neurophysiotherapy practice. Understanding history and the development of ideas can be useful in understanding the current stance taken in relation to certain topics and methods of practice. How different life would be if the early Greek philosophers had not persisted in their thinking that the earth is round not flat! Acceptance of this was a long process which took three centuries of speculation and investigation to achieve. Think of John Snow who cleverly figured out how a water pump caused a cholera epidemic in London, and in so doing saved many lives, yet his ideas on epidemiology were spurned by the political figures of that time. Apparently public health officials today recognize the political struggles

in which reformers often become entangled. During the Annual Pumphandle Lecture in England, members of the John Snow Society remove and then replace a pump handle to symbolize the continuing challenges that face public health advancements. Think how different neurorehabilitation would be today if the concept of neuroplasticity had not been realized. In fact it was the idea that brain structure and function could be changed that underpinned the redirection of neurorehabilitation initiated by the Bobaths and others in the middle of the last century. The direction of stroke rehabilitation and the management of cerebral palsy radically changed due to the Bobaths' pioneering insight into the potential for changeability of the CNS.

I have followed with interest the various strands of discussion on iCSP, in particular the hands on/off discussion. I suspect there is no right or wrong answer to this one other than that it has a place to play in the repertoire of physiotherapy practice, and if used appropriately is a valid thing to do. The 'hands on' idea is very much attributed to, and 'blamed on' Bobath, a topic of debate at congress this year. Bobath is now part of the history of neurophysiotherapy, and perhaps understanding how and why it came into being and what it has to contribute to neurorehabilitation might help to identify what part it has to play in current practice. Over the years knowledge has changed and Bobath has been spawned into different species around the world and its current relevance and stance need to be examined. As I write the 'Bobath debate' is eagerly anticipated and will

hopefully result in a mood of openness, with acknowledgement and acceptance that there are various types of relevant neurophysiotherapy practice, all of which differ in their relevance according to the wide range of clients encountered by neurophysiotherapists. Change takes time as the early philosophers discovered, and it requires constant evaluation of observations, hypotheses, facts and experimental findings, with a few accidental discoveries along the way.

We are continually challenged to be cognisant of the need to be open to investigation of what we do and how we do it, to provide an evidence base for current and future practice. I am hopeful that there will be ongoing rational, co-operative discussion of how we can take neurophysiotherapy forwards in a positive way, bearing in mind that we may need to accept that it may take a long time to resolve some issues (hopefully not three centuries!). However, let's 'remove and replace the pump handle' and keep moving forwards!

# Task–specific training of sit to stand in acute stroke

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A case study design was used to investigate the effects of a task-specific sit-to-stand (STS) training programme in an individual post acute stroke, with the application of a movement science based approach. Speed, weight-bearing symmetry and knee extension strength seem to be of particular importance to the performance of STS and will be the focus of this study. It is anticipated that the task-specific training programme will increase lower limb extension strength, symmetry and speed of STS.

#### **LITERATURE REVIEW**

The sit-to-stand (STS) movement is biomechanically demanding, requiring greater lower extremity joint torque and range of motion than walking or stair climbing. An average STS time of 1.6 - 1.8 seconds has commonly been documented in healthy subjects (Carr and Shepherd 2003, Etnyre and Thomas 2007). Schenkman *et al* (1990) define four phases of STS based on kinematic and kinetic events:

- 1 Flexion-momentum phase, starts with initiation of the movement and ends just before the buttocks are lifted from the seat.
- 2 Momentum-transfer phase, begins as the buttocks are lifted from the seat and ends at maximal ankle dorsiflexion.
- 3 Extension phase, is initiated just after maximal ankle dorsiflexion and ends when the hips first cease to extend; including leg and trunk extension.
- 4 Stabilisation phase, begins after hip extension is reached and ends when all motion associated with stabilization is completed.

The ability to STS post-stroke is commonly compromised through muscle weakness and poor postural stability, often leading to asymmetrical limb loading, reduction in force generation and abnormal kinematics. Slower speeds of up to 4.3 seconds have been recorded in stroke (Cheng et al 1998, Ada et al 1993). Following stroke an individual may have inadequate eccentric control of the trunk and lower limbs for dynamic stability at phase 2, where forward momentum of the upper body is transferred to forward and upward momentum of the total body. At the point of lift-off where the buttocks leave the supporting surface, the base of support (BOS) is reduced as weight is transferred to the feet and it is at this critical point where the subject's postural stability is most challenged (Schenkman et al 1990). Stroke patients may therefore slow the movement speed to compensate for the lack of postural stability (Cheng et al 1998). Carr et al (2002) found that at slower speeds more effort is required due to an increase in time sustaining the overall extensor force through the lower limbs.

Several studies have found that knee extension strength is key to STS performance, particularly for peak force generation at lift-off (Bohannon 2007, Cheng et al 2004, Janssen et al 2002, Lomaglio and Eng 2005). Bohannon (2007) showed that knee extension forces were correlated significantly with independence in STS and suggested that repetitive STS training should be used for achieving such strengthening. Lomaglio and Eng (2005) found greater knee extension torque and greater weight-bearing symmetry related to faster STS in individuals with stroke. Britton et al (2008), and earlier Barreca et al (2004), using randomised control trials (RCT) found that additional task-specific STS practice 30 minutes per day was beneficial in the hospital setting. Research in the community setting also leaned favourably towards task-specific training following stroke (Dean et al 2000, Monger et al 2002).

#### PROCEDURE

#### **Subject Details**

Subject A was an 88 year old male who was admitted to the acute in-patient stroke unit following sudden onset of left sided weakness and slurred speech. CT scanning confirmed a diagnosis of right lacunar infarct. Prior to admission he lived independently and was able to walk unaided.

#### **Analysis of Subject**

On initial assessment the subject was able to STS with standby help. He weighed 82 kg and was 176cm tall, with a body mass index 26.4. Observation and video analysis of the presence/ decrease/absence of invariant kinematic features of STS led to further assessment to identify the main problems interfering with his ability to stand up. Compensatory strategies used were identified and possible causes of the abnormal kinematics and kinetics were assessed. See *Table 1* for details.

Detailed clinical assessment revealed good active and passive range of movement throughout. Touch sensation and proprioception was intact, and no pain was reported. On manual muscle testing weakness was found throughout the left leg at grade 4 on the Oxford Scale compared to grade 5 on the right. No significant perception, cognition or language deficits were detected.

From the analysis of STS the slow movement speed was extremely apparent. The main problems appeared to be muscle weakness (predominantly in the left knee extensors), particularly in relation to peak force generation at lift-off and reduced ability for this leg to bear equal weight. The inadequate eccentric trunk control also seemed to play an important role in the subject's inability to use momentum as moving through flexion into extension during STS.

#### **OBJECTIVE MEASUREMENTS**

#### **1 Timed STS**

Janssen *et al* (2002) in a comprehensive review concluded that use of arms, chair height, speed and foot position substantially influenced STS performance. Therefore these parameters were standardised for all measurements. The subject was instructed to stand using arms to push-up, at a comfortable self-paced speed from a 55cm Bobath plinth. The same therapist gave the same instruction 'ready, steady, stand' and observed from the sagittal plane. Timing with a stop watch started at the point the subject's head started to move anteriorly and ended when no further displacement of the pelvis occurred as described by Carr and Shepherd (2003). The average time was

Phase of STS	Invariant kinematic features (Present, decreased or absent)	Kinematic deviations (Compensatory strategies)	Possible causes of abnormal kinematics (Based on clinical assessment)
Starting position	(R) Foot placement posterior to (L) Both shanks are angled backwards (approx 10cm)	Increased weight bearing on (R) leg	Weakness in (L) lower limb compared to (R) (grade 4)
Phase 1	Reduced inclination of the trunk forwards by hip flexion and reduced spine extension Neck flexed and facing the floor	Use of bilateral upper limbs on supporting surface Slow movement speed and loss of momentum	Weakness in back and hip extensors, reduced eccentric control (grade 4) Kyphosis of spine
Phase 2	Reduced movement of the knees forward by dorsiflexion at the ankles	Multiple attempts used to initiate and achieve 'lift off' Use of fists to push up from plinth A pause between pre-extension and extension phase	Weakness in (L) tibialis anterior (grade 4) Weakness in (L) quadriceps (grade 4) Reduced ability for the braking mechanism, ie the eccentric control
Phases 3 and 4	Reduced extension of the hips and knees for final standing Difficulty stabilising in stance	Posterior stabilisation on the plinth; using bilateral knees to push back against the plinth Excessive postural sway	Weakness in (L) quadriceps (grade 4) Weakness in (L) hip extensors (grade 4) Altered knee and hip synergy

calculated from five STS trials by the same rater. Number of attempts to successful STS was also recorded. Engardt and Olsson (1992) found this method to be reliable when compared with data from a motion analysis system.

#### 2 Weight distribution in final standing from STS

Using the methodology above, with the addition of weighing scales placed under each foot and tape markers to standardise foot position, Five STS tests were performed. Weight (in kg) on right and left leg was recorded at final standing and an average calculated. The weighing scales give a useful indication of weight distribution and symmetry, however forces are not precisely recorded unless expensive force-plate equipment is used (Lomaglio and Eng 2005).

#### **3 Leg Extension Strength**

The subject sat on the plinth with back rest up, knee and ankle joints were positioned to 90° and feet placed on weighing scales positioned on a block with a tape marker to standardise foot position, as displayed in *Figure 1*. Three maximal repetitions for right and left leg were performed and an average measure (in kg) calculated. The weighing scales give a useful appreciation of the lower limb forces but can not be used to indicate specific muscle group strength and the validity and reliability is not established. Wade (1992) reported on the reliability and validity of dynamometers



Figure 1 Set up for leg extension strength test

being the preferred option for measuring muscle strength, but these were not available.

Measurements one to three were taken on day one (three days post-stroke) of the training programme and repeated on day eight by the same rater.

#### **TRAINING STRATEGY**

The subject participated in a one week task specific training programme, Monday to Friday for 45 minutes per day, as recommended by the *Royal*  *College of Physicians National Clinical Guidelines for Stroke* (2008). Van Peppen *et al* (2004) in a comprehensive review found strong evidence that patients benefit from intensive, task-orientated exercise training applied early after stroke.

Since the interaction among parts of STS is high, whole-skill task-specific practice was selected. Additionally, practice was random and varied. Hanlon (1996) found that random practice is more effective than blocked practice with respect to retention over time, when stroke patients attempt to learn functional motor skills. STS was varied randomly in terms of height, speed and type of surface to stand from. Initially practice started at a higher plinth height and progressed to lower; several authors were in agreement that lowering the seat increased the need for force generation (Janssen et al 2002, Mazza et al 2004). STS was practiced with feet on two weighing scales to provide visual feedback to encourage more weight-bearing on the left leg and hence greater strengthening (Van Vliet and Wulf 2006). Specific feedback of performance was given to the patient in summary after five STS repetitions as recommended by Schmidt et al (1990). The aim of each 45 minute session was to maximise the number of STS repetitions, but when the subject fatigued, closed-chain leg extension strengthening exercises were carried out in three sets of ten repetitions and varied randomly with upper limb forward reaching tasks for any remaining time.

Self-monitored practice was set up to promote daily independent practice alongside gym sessions; a practice sheet and training log were issued to the subject to promote motivation. He was instructed to do three sets of ten repetitions, three to four times per day. Part-practice was selected because the subject was unable to perform a full STS without standby help. The partpractice targeted phases 1 and 2 of STS which was deemed the most problematic area. Training that mimics the activity for which the action is needed has been reported to be effective (Ada and Canning 1990). Vision and attention were directed towards an external focus (green cones) which encourages more equal weight-bearing and enhances motor learning (Van Vliet and Wulf 2006). Clear written instructions were provided stating 'Lean your whole body forwards, make your knees touch the green cones and then sit back down'. Three points to remember were listed 1 Starting position keep both feet behind the line 2 Lift your bottom just off the seat

3 Keep your back straight and head up. See *Figures 2 and 3* demonstrating the subject practicing the exercise.



lateral view

Figure 3 Part practice: anterior view

#### FINDINGS

Following one week of training a number of changes were observed and are illustrated in Figures 4 and 5 and described in Table 2.

Tables 3, 4 and 5 overleaf display the changes found pre and post-training with regards to temporal characteristics, weight distribution and leg extension strength.

#### **Goal Setting**

Goal Attainment Scale (GAS) displayed in Table 6, was used to provide an individualised approach to goal setting (Reid and Chesson 1998). The long





Stabilisation

Phase 1 Flexion-Momentum Momentum-Transfer Extension

#### Figure 4 STS pre-training



Phase 1 Phase 2 Flexion-Momentum Momentum-Transfer Extension Phase 4

Phase 3

Figure 5 STS post-training

Stabilisation

Phase of STS	Invariant kinematic features (Present, decreased or absent)	Kinematic deviations (Compensatory strategies)	Possible causes of abnormal kinematics (Based on clinical assessment)
Starting position	(R) foot placement symmetrical with (L)	More even weight bearing on both legs However remains (R) > (L)	Increased strength in (L) lower limb increasing its ability to weight-bear
Phase 1	Greater inclination of the trunk forwards by flexion at the hips and with improved spine and neck extension	Use of bilateral upper limbs on supporting surface still required	Increased back extensor eccentric control Increased speed of movement including use of momentum Kyphosis of spine unchanged
Phase 2	Improved movement of the knees forward by dorsiflexion at the ankles	Use of flat palms as opposed to fists to push up from plinth. Movement remains slow but greater overlap between pre-extension and extension phase	Increased strength in (L) tibialis anterior (grade 4) Increased strength in (L) and (R) quadriceps (grade 4) One attempt to initiate and achieve 'lift off'
Phases 3 and 4	Improved extension of the hips and knees for final standing	Some difficulty remains in stabilising for final standing, with increased postural sway	Increased strength in (L) and (R) quadriceps Knees do not make contact posteriorly with plinth Increased strength in hip extensors (grade 4)

#### Table 2 Post-training analysis of STS

	Pre-tra	aining	Post-ti	raining	% impro	ovement
STS No	No of attempts	Time (s)	No of attempts	Time (s)	No of attempts	Time (s)
1	4	25.7	1	6.6		
2	2	20.9	1	6.1		
3	3	24.2	1	6.4		
4	2	17.8	1	7.4		
5	2	18.0	1	6.6		
Average	2.6	21.3	1	6.6	62%	69%
Table 2 Timed (TT in seconds (a) and number (as) of attempts taken to (TT 0) improvement calculated from guerras second						

Table 3 Timed STS in seconds (s) and number (no) of attempts taken to STS. % improvement calculated from average scores

	Pre-tr	aining		Post-training	5
STS No	Right	Left	Right	Left	Increase weight on (L)
1	58	24	54	28	
2	61	21	46	36	
3	53	29	57	25	
4	63	19	49	33	
5	48	34	43	39	
Average	56.6 kg	25.4 kg	49.8 kg	32.2 kg	6.8 kg
% Body weight	69%	31%	61%	39%	8%

 Table 4
 Weight distribution (in kg) on right and left leg at final standing from STS. % body weight calculated from average score and the increase of weight on (L) leq.

term functional goal for the individual was to be able to stand from his own 50cm high arm chair and walk independently in order to return to his own home with his wife. Kerr and Kerr (2002) found a significant correlation between an individual's ability to sit-to-stand and sit-to-walk performance.

	+2	STS independently from a 50cm surface by 1st attempt		
Post-training level	+1	STS independently from a 55cm surface by 1st attempt		
	0	STS independently from a 55cm surface by multiple attempts		
Pre-training level	-1	STS with standby help from a 55cm surface by multiple attempts		
	-2	STS with assistance of 1 from a 55cm surface by multiple attempts		
Table 6 Goal Attainment Scale				

Pre-tra	aining	Post-tr	aining	% Improv	/ement
Right (kg)	Left (kg)	Right (kg)	Left (kg)	Right	Left
21	11	25	18	19%	64%

 Table 5
 Leg extension strength from weighing scales

 (average of three maximal repetitions). % improvement

#### DISCUSSION

The study aimed to investigate the effects of a task-specific training programme in an individual post acute stroke. Speed of movement, weightbearing symmetry and knee extension strength were the focus in the performance of STS.

In support of the work by Ada and Westwood (1992) there was an improvement found in speed post-training. However, unlike previous studies the STS time remains significantly greater at 6.6s. It is important to note that differences in previous STS studies, in defining movement onset, lift-off and end point, and differences in measurements and methodology make it difficult to generalise or compare findings. This case study supports Ada et al (1993) in that when movement accuracy is impaired as a result of a stroke, slow, discontinuous movements are observed. Slow movement speed and loss of momentum were likely to be adopted so the body remains inherently stable for when the body moves from horizontal to vertical and to a reduced BOS. It may be explained by the subject's reduced ability to utilise the braking mechanism, ie the eccentric control in order to slow the body's forward progression once lift-off occurs. Although the speed remains comparatively slow, a 15s decrease in STS duration and greater overlap was observed between phases 1, 2 and 3 post-training. One explanation for this may be increased back and hip extensor eccentric control. To support this was the improved extended posture illustrated in the STS photographs preand post-training. The 69% reduction in STS duration may be explained by this subject's ability to

achieve successful standing consistently on the first attempt post-training as opposed to multiple attempts, thus reducing the whole movement duration significantly. This study may support the work by Shepherd and Gentile (1994) and Schenkman *et al* (1990) who similarly proposed that improving the forward momentum of the trunk will facilitate the lower limb extension and vertical movement up into standing, thus increasing the speed of the movement.

In agreement with several studies was the finding of increased lower limb extension strength of 64% on the paretic leg which may be key to explaining the improvement in velocity, ability to weight-bear more symmetrically, ability to generate greater peak force for lift-off and to achieve independence on the first attempt of STS (Bohannon 2007, Cheng *et al* 2004, Janssen *et al* 2002, Lomaglio and Eng 2005).

Similarly to Britton *et al* (2008), following one week of STS intervention 8% more body weight was taken through the paretic leg. This may be another important factor to explain the improvement in velocity , in agreement with Lomaglio and Eng (2005) who suggest that greater lower limb joint torques and the ability to load the paretic leg results in faster STS. Auditory feedback during STS practice as described by Van Vliet and Wulf (2006) may have been preferable to the visual feedback used via weighing scales, to reduce the tendency of the subject to look downwards to the scales thus altering the kinematics.

The subject remained dependent on the use of his upper limbs post-training as expected. Carr and Gentile (1994) found that when arms were restricted subjects were less likely to project their COM as far forward at lift-off as when arms were free to use. They suggested that upper limbs not only play a role in balance they also facilitate lower limb propulsion. Various authors expressed that using this upper limb compensatory strategy may lower the moments needed at the knee by 50% (Etnyre and Thomas 2007, Janssen et al 2002). Arms were used during training as were required for the subject to attempt standing and enabled an increase in his functional independence. Progression may have aimed to further increase balance and lower limb extension strength, to reduce the need to produce some force through the upper limbs in order to stand up (Carr and Gentile 1994, Etnyre and Thomas 2007).

Ada and Canning (1990) highlight that skill in performance increases as a direct function of the amount of practice. It was difficult to attribute improvements in STS performance to any single component, ie the contribution of muscle strength gains in lower limbs or trunk, the greater ability to weight-bear through the paretic leg or the increase in ability to use and control velocity. The observed increase in smoothness in movement could be the result of improved knee and hip synergy or simply the increase in velocity. Training aimed to tackle the above components as all aspects seemed intricately linked in order for this subject to improve STS performance. However, this maybe viewed as a limitation to the study when posed with the difficulty of interpreting the findings.

#### **KEY FINDINGS**

This case study suggests that therapy aimed at task-specific training incorporating whole skill and self-monitored part-practice may be effective in improving STS performance, in relation particularly to increased speed, symmetry and lower limb strength post acute stroke. Greater than expected improvement was achieved, demonstrated by progression of his goal on GAS from -1 to +1 and an increase in his functional independence. It is important to note that the subject began the training programme three days post stroke therefore it may be the very acute nature that accounts for the greater changes found. Hanlon (1996) recognised that in rehabilitation research with stroke patients, it is difficult to distinguish the influence of training from spontaneous recovery, particularly in a single subject case study design.

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#### APPENDICES

#### Appendix 1 Leg strengthening and reaching exercises

#### Exercise 1



**Description** Closed-chain leg extension strengthening. Subject in starting position as described in measurements section (4). Three sets of ten repetitions with a five second hold and progressed up to ten second holds, were performed on (L) leg.

**Instruction** Move the dial on the scale as far as possible by pushing through the left leg as hard as possible, whilst relaxing the right leg, don't let this dial move.

Feedback: Concurrent external visual feedback from the scale reading; motivational.

**Rationale** The knee and ankle joints are positioned at the range that resembles where the extensors are activated at lift-off during STS, to strengthen in the length they are required to generate force (Trew and Everett 2005).

#### Exercise 2



**Description** Upper limb reaching in sitting. The subject reached for the rings and placed them over the targets. The reaching was practiced by randomly using left arm, right arm or both arms together. The exercise was progressed by reaching a greater distance forward.

**Instruction** Reach forward for the rings and place over each target.

**Feedback** Feedback on distance reached and about maintaining an erect trunk and head was given in summary after each five cones were placed on target.

**Rationale** The reaching exercise was designed to improve the trunk movement forwards by flexion at the hips, to improve the pre-extension phase of STS. Improved inclination of the trunk forwards with extended neck and spine has been found to augment lower limb extension, with flow of energy and momentum from upper body flexion into lower limb extension (Shepherd and Gentile 1994).

#### Self monitored practice

#### Name

#### Goal

To improve leg strength and control of your body when moving forwards, to be able to stand up independently in one week.

#### Instructions

Lean your whole body forwards, make your knees touch the green cones and then sit back down.

#### Things to remember

- Starting position keep both feet behind the line.
- Lift your bottom just off the seat.
- Keep your back straight and head up.

#### How much/how often

- Do up to ten repetitions and three sets
- Three to four times per day

Sessions per day	Mon	Tue	Wed	Thurs	Fri	Sat	Sun
1							
2							
3							
4							

# **Exploring functional recovery** of the upper limb two years post severe traumatic brain injury – a case report

Hannah L Dearlove MCSP Senior 1 Physiotherapist

There is growing evidence to suggest that significant motor recovery can continue for several years after a traumatic brain injury, (Burke *et al* 2000, Butler *et al* 1997, Hitchcock and Watson 2004, Wales and Bernhardt 2000, Watson *et al* 2003, Watson 2007). Thus upper limb potential should continue to be explored in late stage rehabilitation. In the acute stage the rehabilitation of the upper limb can be overshadowed, as clients tend to have a greater focus towards mobility. Also, repeated failed attempts to use the affected arm leading to negative reinforcement, can establish learnt non use of the upper limb (Taub *et al* 1993) and further potential may not be realised.

Upper limb function is complex requiring appropriate central stability, strength and dexterity (Champion *et al* 2009). The roles of the upper limb are many and varied including postural orientation, balance, support, gesture, communication, skilled manipulative tasks and power based tasks (Champion *et al* 2009).

The brain's ventromedial and dorsolateral systems work together to provide efficient upper limb function. The ventromedial system is concerned with posture and balance, and integrated movement of the trunk and limbs. The dorsolateral system controls the independent use of the upper limbs, the skilled manipulative role of the hand, and also has a role in balance and postural control (Lundy-Ekman 2007).

This case report describes the exploration of upper limb recovery in a young client two years post traumatic brain injury.

#### THE PATIENT

In May 2007, aged 23, Sue sustained a severe traumatic brain injury in a road traffic accident. CT showed frontal lobe petechiae, subarachnoid and intraventricular haemorrhages and pneumocephalus. She commenced rehabilitation at the Queen Elizabeth's Foundation, Brain Injury Centre, Surrey in April 2009. She had physical, cognitive, speech and language difficulties. She was independently mobile indoors unaided.

After assessment a problem list was developed (see *Table 1*). Photographs were taken to demonstrate posture and alignment at admission (see *Figures 1, 3 and 4*)

#### Impairments

- High tone throughout right upper limb
- Mal-alignment of right shoulder girdle
  - retraction of shoulder girdle
  - anterior subluxation at glenohumeral joint
- Mal-aligned soft-tissues leading to restrictions at elbow, forearm and hand
- Minimal activity at shoulder
- 40 degrees active flexion only
- No active elbow extension, dominance of elbow flexion
- Minimal activity distal to elbow
- Increased tone in finger flexors, no extensor activity
- Hypersensitive palm
- Right upper limb associated reaction during walking

#### **Activity Limitations**

- Unable to incorporate upper limb into function
- Unable to grasp or release objects

#### **Participation Limitations**

- Unable to return home
- Unable to pursue previous leisure activities eg netball
- Unable to return to employment

Table 1 Client problem list

Sue's motivation to work on her upper limb was initially low. This may have been due to limited recovery to date and insight difficulties. Her focus was towards improving her walking speed and returning to sport, particularly netball.

#### INTERVENTION

Sue had physiotherapy five times a week (45 to 60 minutes in duration) during the four month intervention period. Although her physical difficulties involved both the dorsolateral and ventromedial systems, on assessment it was apparent that the dorsolateral system was the primary problem, giving a starting point for treatment. Her main difficulty was selective activity and independent use of her right upper limb. Her posture, balance and core stability were also affected but to a lesser degree. It was hypothesised that improvements in her right upper limb would also have a positive influence on her gait and balance control, due to improved alignment at her right upper quadrant (Shumway-Cook and Woollacott 2001), thereby influencing the ventromedial systems.

#### Preparation

Prior to commencing treatment it was important to prepare the position Sue was working in. This was to ensure optimal activation of the trunk and orientation to the contralateral side. For example; when sitting, pelvic alignment and limb placement were considered.

#### Soft tissue mobilisation and sensory stimulation

The mal-alignment and soft tissue restrictions, along with increased tone made it extremely difficult for Sue to access the activity in her right upper limb and switch off over active muscles. This disrupted normal movement patterns, leading to compensations.

Specific soft tissue mobilisation focused on improving length and alignment prior to activation. The main muscles targeted were pectorals, biceps, brachioradialis, supinator, pronators and wrist and finger flexors. Work also included gaining length in the soft tissues of the forearm, particularly the ulna border for the reach pattern and gaining length and width in the palm (see *Figures 7, 8 and 9*).

Sensory stimulation was used in treatment to reduce hypersensitivity (Doyle *et al* 2010). Soft



Figure 1 **Posture before** intervention



Figure 2 Posture after intervention



Figure 3 Posture of hand before intervention



Figure 4 Posture of hand before intervention



Figure 5 Posture of hand after intervention



Figure 6 Posture of hand after intervention



Figure 7 Distraction of forearm and wrist alternatively to gain space and length in forearm



Figure 8 Gaining length and width in the hand to re-gain the natural arches



Figure 9 Gaining length in metacarpal phalangeal joints and activation of lumbricals







Figure 11 Prone weight bearing through upper limbs



Figure 12 Activation of extensor digiti minimi

tissue mobilisation contributed to sensory work, as did use of different textures and of a vibration plate, which helped to reduce muscle tone (see *Figure 10*).

Initially Sue wore a thermoplastic hand and wrist splint throughout the day, to maintain range of movement. However, as her upper limb rehabilitation progressed and she became more focused, the splint was changed to night-time use. This allowed her hand to be free during the day to explore sensation and activity.

#### Activation and strengthening

Activation and strengthening were essential following soft tissue mobilisation in order to maintain the alignment and length gained and in preparation for working towards function. Following exploration, it became apparent that Sue's hand responded very well as a key point of control<sup>1</sup>. Therefore it was often used to facilitate activity in a variety of muscles.

This work included:

- Selective activation of triceps to direct the hand and demand stability at the elbow and shoulder girdle. Working in a variety of positions demanding differing levels of postural control e.g. prone weight bearing (see *Figure 11*)
- Specific activation and strengthening of the intrinsic muscles in the hand to re-gain the palmar arches, provide the strength for grasp and provide the stability required for single digit control (see *Figure 9*).
- Selective activation and strengthening of single digits including abductor digiti minimi in order to gain stability in the hand (see *Figure 12*) and abduction and extension of the thumb for stability and shaping of the hand for grasp (Rosenkrantz and Rothwell 2004). Following activation Sue demonstrated a contactual hand-orienting response<sup>2</sup>, enabling the hand

to start its functional tasks.

#### **Function and Variety**

Once activity was gained, it was facilitated into meaningful function to consolidate learning. Practice was essential to ensure positive adaptive changes within the nervous system.

It was found to be beneficial to use objects that were meaningful and motivational, as reach has such a strong cognitive component (Champion *et al* 2009). Sue responded well using objects such as a wine bottle, a netball and chocolate. (see *Figures 13, 14 and 15*). She explored objects that required differing hand pre-shaping, grips, grip strength and unilateral and bilateral involvement. Different postures were used in treatment to demand different levels of postural control, to link the upper limb with the rest of the body and explore its strong role in orientation. For example, treatment included tasks in standing, prone, sitting and side lying.

Following liaison with the multi-disciplinary team, Sue was encouraged to use function at an appropriate level, for example in art and occupational therapy.

#### **Core activation**

The starting point for treatment was the upper limb, due to the focus on rehabilitation of the dorsolateral system. However, Sue's right upper limb was often used to activate the core and postural muscles controlled by the ventromedial system, integrating the upper limb with the trunk and lower limbs (see *Figure 16*).

#### **RESULTS/OUTCOME**

Following intervention, outcome measures and photographic records demonstrated improvements in alignment, activity and function (see *Table 2, Table 3*, and *Figures 2, 5 and 6*). This was even more evident when observing Sue functionally. Her right upper limb was able to assist and stabilise and she was naturally incorporating it into function. Sue's upper limb recovery coincided with improvements in balance control and gait,

<sup>&</sup>lt;sup>1</sup> Key point of control: an area of the body from which movement may be most effectively controlled (Edwards 1991).

<sup>&</sup>lt;sup>2</sup> Contactual hand – orientating response: a 'frictional contact of the hand to a surface' (Porter and Lemon 1995 cited in Champion et al 2009).





Figure 13 Pre shaping for grasp

Figure 14 Grip strength



Figure 15 Exploring holding netball in correct context (hoop in front)

#### Improved alignment of right upper quadrant

- Decreased subluxation at glenohumeral joint
- Decreased shoulder girdle retraction
- Improved active range of movement and muscle strength in upper limb
- Increased active elbow extension

#### Improved activity in the hand

- Single digit control of thumb, 2nd and 5th digit
- Selective finger flexion and abduction, with active extension
- Decreased hypersensitivity of palm
- Demonstrated pre-shaping when reaching for an object
- Improved posture of the hand
- Achieving a contactual hand orienting response

#### **Functional improvements**

- Able to use both hands to pour from a bottle
- Able to stabilise objects, such as a mixing bowl, with right hand
- Able to grasp and release small objects and initiate release of larger objects
- Able to use arm to assist with personal care, washing and dressing
- Independent with personal activities of daily living

#### Participation

- Starting to explore previous leisure activities
- Planning to explore work experience related to previous employment

#### Table 2 Client problem list: improvements in activity and function

(see *Table 3*), even though these aspects of treatment were not specifically targeted in the intervention period.

Sue's motivation for her upper limb rehabilitation significantly improved within the first few weeks. She often asked to work on her arm and would independently stretch and use it. At the end of the intervention she reported that her arm felt 'lighter' and 'more active' and she was pleased she could use it to assist her left. Sue is continuing with her rehabilitation in a centre closer to her home, and it is anticipated that further improvement in her upper limb activity and function will occur.



Figure 16 Using the upper limb to activate core muscles

Outcome measures	24 Ap	r <b>il 2009</b>	10 Septer	nber 2009
Frenchay Arm Test (Heller et al, 1987)	Left 4/5	Right 0/5	Left 5/5	Right 1/5
<b>Rivermead Motor</b> <b>Function</b> – arm subscale (Lamin 2004)	Left 9/15	Right 0/15	Left 11/15	Right 3/15
Shoulder subluxation	1 finger breadth		1⁄2 finger breadth	
Resting elbow position in sitting	95° – extension		110° – e	xtension
Glenohumeral active flexion	40°		80°	
<b>10 metre walk</b> (Van Loo <i>et al</i> 2003)	24 seconds, 32 steps		10 second	ds, 17 steps
Berg Balance (DeSouza and Tyson 2004)	41/56		46	5/56
Video review	Right upper limb associated (flexion) reaction when walking		Reduced r limb assoc reaction w walking	ight upper ciated vhen

Table 3 Client outcome measures

#### DISCUSSION

Sue was a client in late stage rehabilitation following a traumatic brain injury, with cognitive, speech, language and physical difficulties. She was unable to use her right upper limb functionally, although there was some activity present. The recovery of her right upper limb had been limited and initially her motivation to work on this was low, possibly due to poor recovery and reduced insight.

The dorsolateral system was considered to be the primary problem in Sue's upper limb, giving a clear starting point for treatment. Treatment involved core activation, strengthening and functional re-education with meaningful tasks to drive positive neural changes. The upper limb was used to facilitate activity within the ventromedial system to integrate movement of the trunk and limbs.

Sue's motivation and focus increased as her upper limb activity progressed. Using meaningful objects increased activation and engaged her cognitively. Once activity was accessed it was incorporated into meaningful function to consolidate learning. To encourage adaptability and variety she was challenged by working in different positions, to use objects requiring different grips and strength and to practice both unilateral and bilateral upper limb tasks.

It was essential to liaise closely with the multidisciplinary team to encourage Sue to incorporate her right upper limb appropriately into function. Functional activities needed to be achievable to avoid frustration and at the right level to ensure compensatory activity was minimised.

Upper limb objective measures demonstrated improvement in the right arm, but did not completely reflect the functional change which was observed. Sue was automatically incorporating her upper limb in activities She progressed from having a non functional arm to one which could assist and stabilise in functional tasks.

Sue's upper limb recovery coincided with improvements in walking efficiency and balance control. This could be for a number of reasons; the upper limb activity demanding more postural control; improved right upper quadrant alignment; a less dependent arm and the reduced associated reaction.

This case study supports the idea that motor recovery can continue to occur several years post traumatic brain injury (Burke *et al* 2000, Butler *et al* 1997, Hitchcock and Watson 2004, Wales and Bernhardt 2000, Watson *et al* 2003, Watson 2007). This highlights the importance of ongoing assessment of the upper limb and of keeping the arm involved from the onset of injury. Rehabilitation of the hand and arm can sometimes be over-shadowed by prioritizing walking. However, as this case study suggests, enhanced upper limb function can also contribute to improved postural stability and gait.

#### SUMMARY

- Significant motor recovery can continue for several years after brain injury.
- Exploration of upper limb recovery and function should acknowledge this.
- Determining the primary neurological system involved can provide a starting point for treatment.
- Upper limb treatment should ensure tasks and objects used are meaningful and motivational, as reach has a strong cognitive component.
- Upper limb recovery can have a positive effect on balance control and walking efficiency.
- Upper limb rehabilitation that results in an arm that can assist with function may potentiate further recovery.

#### ACKNOWLEDGMENTS

I would like to thank the Sue and her family for giving their permission to give this account. Thanks also go to my colleagues who were involved in her care and management. The client's real name was changed for this account.

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# **Does 'stop standing'improve reach for function in sitting?**

**Nicola Hills** 

Postural control is defined as the ability to control body position for postural stability and orientation within the environment (Shumway-Cook and Woollacott 2007), it is essential for reaching (Massion et al 2004) and is found to be reduced following stroke (Dickstein *et al* 2004, Tessem *et al* 2007). By facilitating an efficient stand to sit transfer (referred to as ëstop standingí) the therapist can improve essential components of reach and grasp such as; seated alignment, visual target location, postural control, scapulothoracic stability and lower limb weight bearing.

The use of 'stop standing' has been investigated using a clinical case study. The results demonstrate an increase of three points in the trunk impairment scale and photographs illustrate an improvement in seated posture and reach efficiency. Recommendations are made for the use of 'stop standing' in clinical practice and for further research.

'Stop standing' describes the development of an efficient stand to sit transfer, whereby facilitation enables forward translation of the knees, dynamic stability of the trunk and pelvis and therefore a stable reference point for eccentric lower limb activity (Raine *et al* 2009). 'Stop standing' should prevent a fall into sitting, providing a dynamic sitting posture and enabling the upper limbs to be free for use for in functional tasks such as reach and grasp. The following text will describe the physiological mechanisms underpinning 'stop standing' and illustrate the use of 'stop standing' using a clinical case study.

#### **LITERATURE REVIEW**

An efficient reach requires the following:

• Locating the target, requiring eye-head co-ordination (Shumway-Cook and Woollacott 2007)

- Postural control (Massion et al 2004).
- The ability to transport the upper limb in space, needing stability of the shoulder complex and activation at the shoulder, elbow and wrist joints to carry the limb forward (Edwards 2002).
- The ability to grasp and release (Edwards 2002).

There are specific musculoskeletal (eg joint range of movement, biomechanics) and neural (motor co-ordination, sensory processes, body schema and higher level processing) components that contribute to the requirements of efficient reach mentioned above (Shumway-Cook and Woollacott 2007).

For a successful reach, the object must first be located in space (Raine et al 2009). With vision, the parietal cortex in particular the anterior intraparietal cortex, gains vital information about the location, size, shape, weight of the object to enable feedforward pre-shaping of the hand as it moves towards the target location (Crawford et al 2004). Visual information can dominate proprioception if sensory modalities are in conflict (Maravita et al 2003). In order to locate the target our eyes move alone if the object is in our central visual field; if located in our peripheral field our eyes and head are required to move (Shumway-Cook and Woollacott 2007). If we descend poorly into sitting, producing a seated posture dominated by cervicothoracic flexion and/or compensatory head fixation, the head will have to overcome significant inertia to locate the target in space (Shumway-Cook and Woollacott 2007) and an effortful, inefficient reach will ensue. Could 'stop standing' provide a more extended, stable seated posture, enabling less effortful visual location?

Performing a reaching task produces a voluntary perturbation and will alter the centre of gravity within the support surface, it is therefore essential that a dynamic seated posture must be achieved and then preserved in order to accomplish the task accurately (Massion 2004). Anticipatory postural adjustments (APAs) in the trunk are executed before or alongside upper limb movement, to prepare the trunk against destabilising forces imposed by the movement and orientate the trunk in space so the desired reaching task can be undertaken efficiently (Dickstein 2004). The generation of APAs are affected by the expected magnitude and the direction of the perturbation, voluntary action associated with the perturbation and the current stability conditions (Slijper 2002). Impaired postural control can result in delayed APAs (Graham et al 2009). If 'stop standing' provided dynamic seated stability, the generation of APAs would be greater, postural control would improve and a more efficient reach would follow.

Dickstein et al (2004) investigated APAs in trunk muscles of fifty post-stroke hemiplegic patients with middle cerebral artery (MCA) lesions. Compared to age matched controls, they found a significant, bilateral, delay in activation of ipsilateral erector spinae on upper limb flexion and less symmetry in the activation of latissimus dorsi and external oblique on the paretic side of the body when flexing the limbs in sitting. They concluded that these trunk impairments warranted specific consideration during the rehabilitation of stroke patients. This is supported by Raine *et al* (2009) and Shumway-Cook and Woollacott (2007) who advocate that when retraining reaching, the therapist must assist the patient to regain sufficient postural stability to meet the task demands.

The affect of impaired postural control on upper limb reaching was studied by Tessem et al (2007). They examined centre of pressure (COP) displacement patterns of twenty-one stroke patients whilst reaching in sitting. COP is the centre of the distribution of the total force applied to the support surface (Shumway-Cook and Woollacott 2007). Compared to age and gender matched controls, stroke patients deviated more laterally when reaching forwards (p < 0.001), and had less lateral displacement when reaching sideways to their unaffected side (p < 0.01). They suggested the deviating COP displacements were due to impairments in generating the necessary postural adjustments for efficient reaching. This is only an assumption as electromyography (EMG) of trunk muscles was not tested. Due to small subject numbers, this study is limited.

The musculoskeletal components of posture that can impact upon an efficient reach must also be considered. Scapula stability is essential for optimal upper limb function (Mottram 1997, Shumway-Cook and Woollacott 2007), the scapulothoracic joint is dependent on active control because it has minimal bony, capsular or ligamentous attachments (Mottram 1997). Mottram (1997) emphasised that poor cervico-thoracic and lumbar postures exacerbates scapulo-thoracic instability. Margery and Jones (2003) also highlighted that cervicothoracic posture has considerable influence on scapular position and mobility. This is supported by Kebaste *et al* (1999), who showed a significant reduction in shoulder abduction range of movement, scapular movement and abduction strength (at 90° abduction) in slouched seated postures compared to erect seated posture. It must be noted that this research was carried out on young (mean age, 30.2 years), healthy individuals. However, it does give us insight into how posture can affect upper limb function. Sitting alignment will contribute to scapulothoracic positioning and stability, and ultimately determine how free the scapula and glenohumeral joint is to move the upper limb forward for reach. Could 'stop standing' enable an extended, dynamic seated posture, thus enabling free upper limbs for reach?

Tessem (2007) commented that 'weight transfer to the lower extremities is essential to optimise reaching in the seated position', this is further supported by Shumway-Cook and Woollacott (2007) and Raine *et al* (2009) who suggest that lower limb muscles are active in anticipation of reaching in sitting. This author has been unable to find any physiological measurement to support this in the literature. However, it would strengthen the argument that by creating eccentric lower limb activity during 'stop standing' would enable more active lower limbs in sitting for reach.

The literature review has identified a number of systems (visual target location, postural control including acquisition of APAs, scapulothoracic stability and lower limb weight bearing) that ëstop standingí could influence. It is consequently hypothesised that 'stop standing' will improve postural stability and therefore efficiency of reach in sitting.

For the case study, the Trunk Impairment Scale (TIS) (Verheyden *et al* 2004) has been selected as a valid, reliable outcome measure for the treatment of stroke patients. This scale has three subscales evaluating static and dynamic sitting balance and coordination of trunk movement, giving an overall score out of 23 (Verheyden *et al* 2004). Since 'stop standing' aims to improve postural control in sitting, the TIS was an appropriate outcome measure to use.

Visual analysis using photographs was used as a creative outcome measure to observe posture and efficiency of reach. The validity of photographs which are two-dimensional images to measure a three-dimensional concept such as posture has



Figure 1 Sitting posture highlights fixation of left upper limb and head to compensate for poor, seated postural control. Note, distended abdomen secondary to renal pathology, meaning lengthened abdominals impair postural control further.



Figure 2 Seated posture dominated by flexion and posterior pelvic tilt. Again evidence of head and left upper limb fixation.



Figure 3 Increased weight bearing on left side, with the left shoulder raised. Right scapula away from chest wall, indicating poor scapulothoracic stability.

been called into question by Carr *et al* (1999). However, in the absence of an alternative means to evaluate posture and reach efficiency, it was deemed appropriate to use photographs illustrate posture and reach efficiency to the reader.

#### **CASE STUDY**

Mr A consented to involvement in the study by signing a locally agreed consent form. Despite his expressive dysphasia, receptively he understood complex commands, and was able to communicate that he understood what consenting to the study would entail using non-verbal means (such as nod of the head).

#### History

48 year old man who sustained a left middle cerebral artery infarct. On admission he had a dense right hemiplegia and aphasia. He had a past medical history of polycystic kidneys (causing abdominal distension) and was having dialysis three times per week. Pre-admission he was independent, living in a house with his wife and working full time as a hotel manager. During the first six weeks following his stroke he was medically unwell with kidney infections, abdominal pain and chest infections, meaning his rehabilitation was limited to bedside treatment of sitting out, sit to stand practice and range of movement activities in the bed.

Problems on initial assessment where classified using *International Classification of Functioning, Disability and Health* (ICF) (WHO 2001).

#### **Body functions and systems**

- Moderate low tone right upper limb, good selective movement throughout, difficulty recruiting anti-gravity activity.
- Weakness and muscle atrophy throughout, R>L.
- Poor seated and standing postural control, gaining stability with compensatory head and left upper limb fixation.
- Flexed inactive trunk, with difficulty creating linear extension.



Figure 4 Reach prior to 'stop standing' Lack of linear trunk extension and APAs, lead to inefficient reach, with evidence of fixation at the head and left upper limb. Due to impaired postural control in picture 4 (left) compensatory activation of pectoral muscles, biceps and brachioradialis is observed, (this indicates the degree of effort). There is no evidence of hand pre-shaping in left picture and the 4th and 5th digit do not extend full to grasp the cup in right picture. Note; patient A was unable to pick up the cup once grasp was achieved; movement was very slow and effortful.



Figure 5 Illustrates 'stop standing', with forward translation of the knees. Patient remained flexed at cervical spine, and fixing with left hand, indicating some difficulty recruiting preparatory APAs (pAPAs) for the movement.



Figure 6 Reach following 'stop standing'. Increased trunk

extension and therefore postural control enables the right upper limb to be free for reach. There is less head and left upper limb fixation compared to Figure 4. He had begun to pick up the cup in the right picture but was unable to take the full weight of it from the surface.



Figure 7 'Stop standing' demonstrates improved acquisition of pAPAs, with greater trunk extension, an less compensation compare to Figure 5.

• Very poor trunk rotation, with stiff thoracic vertebrae and costovertebral joints R>L.

#### **Activity limitations**

- Non-functional right (dominant) upper limb.
- Unable to sit without fixing with left upper limb.
- Needing assistance of one person for all transfers and walking.

#### **Participation level**

- Unable to return home (as was required to climb stairs).
- Unable to work as a hotel manager.
- Difficulty socialising secondary to expressive dysphasia (this was improving).

#### **Treatment focus**

- 'Stop standing'.
- Trunk rotation in sitting and mobilisation of the ribs in side-lying to address musculoskeletal stiffness and impaired range of movement (Edwards 2002).
- Facilitation of linear trunk extension is sitting (Raine et al 2009).
- Facilitation of functional right upper limb tasks once seated alignment had improved.
- Providing an exercise programme; cup to mouth and hand placement onto table in front, positioning in sitting with a more extended trunk, use of alternative postural sets for sleeping (side-lying).

#### **Outcome after 5 days**

• Able to bring cup to mouth and take a small sip with cup full (still having to flex cervical spine at end of range).





Figure 8 The acquisition of APAs enables the right upper limb to move freely to reach. There appears to be more selective recruitment proximally in right shoulder. Note: he is able to pick up the cup to drink. Unfortunately, volume of fluid in the cup was not standardised between photographs.



Figure 9 Postural alignment substantially improved compared to Figures 1, 2 and 3. Small base of support means the centre of mass is raised, demanding more postural control. There is still some evidence of right scapula 'winging', indicating that impaired scapulothoracic stability remains.

• Able to sit to stand, lie to sit and roll independently.

#### TIS

Pre treatment	Post treatment – after five days
10/23	13/23

#### DISCUSSION

The case study demonstrated an improvement of three points in the TIS, Verheyden *et al* (2004) state that only an improvement of four points is clinically relevant.

By examining the photographs (compare *Figures* 1, 2 and 3 with Figure 9) sitting alignment improved substantially. A more neutral pelvis, lumbar lordosis and neutral thoracic kyphosis is observed, this is identified as an efficient seated posture by O'Sullivan et al (2002). O'Sullivan et al (2002), studied surface EMG of superficial lumbar multifidus, internal oblique, rectus abdominus, external oblique, and thoracic extensor spinae muscles in erect and slump sitting in 20 healthy adults. A significant decrease in superficial lumbar multifidus (p = 0.007), internal oblique (p= 0.012) and thoracic erector spinae (p = 0.003) muscles in slump sitting compared to erect sitting was shown. The patient was able to maintain an erect seated posture post treatment, based on this research, we can assume that his core stabilising muscles were more active following treatment.

Mr A demonstrated a reduction in compensatory fixation of the head, trunk and upper limbs following 'stop standing'. Compensatory strategies (seen in *Figures 1, 2 and 3*) were recruited due to an inability to maintain balance and postural stability (Cirstea and Levin 2000), which can limit limb girdle mobility and therefore impact upon upper limb function (Cirstea and Levin 2000). This is well illustrated in the case study, where due to trunk instability the compensatory fixation of the head and left upper limb, contributes to an effortful and inefficient reach (*Figure 4*). A reduction in compensatory mechanisms (*Figure 9*) gives rise to enhanced postural stability; demonstrated by TIS improvements.

Mr A's ability to reach had become more efficient following ëstop standingí (compare *Figure 4* with *Figure 6*); his trunk is more extended, there is less compensatory left upper limb weight bearing and his upper limb was free for reach. The photographs fail to illustrate the increased speed of Mr A's reach following 'stop standing'. Greater speed demands greater stability and is normally associated with an increase in postural tone (Raine *et al* 2009). If timing reach to the cup had been used as an additional outcome measure, it could be demonstrated that an improvement in postural tone following 'stop standing' enabled a faster reach to the cup.

Completing the project has certainly altered the author's management of upper limb impairment following stroke, and has certainly involved an increased focus on postural control using 'stop standing' within this. However, during the process it was challenging to select acute stroke patients that had sufficient postural and lower limb control to allow work into 'stop standing'. It maybe that there is a specific functional level needed for 'stop standing' to be useful. This will continue to be a focus within the author's clinical practice. Furthermore, it is possible that patients could use the components of 'stop standing' within their home exercise programme, as a basis to focus on postural control and upper limb tasks.

There are a number of limitations to the case study. Firstly, the improvements in the TIS, postural control and reach cannot be attributed to 'stop standing' alone, as Mr A underwent a holistic programme of rehabilitation focusing on postural control and reach. Secondly, the cup position, weight and plinth height were not standardised, meaning reach trajectories could have altered between photographs. Thirdly, as postural analysis with photographs is limited (Carr *et al* 1999), and photographs were used as a primary outcome measure, the results lack reproducability. Additional outcome measures such as time to reach the cup and functional reach would have further validated the results.

#### **CONCLUSION AND RECOMMENDATIONS**

The use of 'stop standing' as part of the treatment for a stroke patient has demonstrated an improvement in the TIS (3 points), seated postural alignement and efficiency of reach. This supports the hypothesis that 'stop standing' will improve postural stability and therefore efficiency of reach in sitting.

Further research is needed to investigate the effect of 'stop standing' on seated postural control and reaching. Investigating EMG activity of superficial trunk muscles and weight transference during reach pre and post 'stop standing' would give further insight into the physiological response to 'stop standing'.

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# **The relationship between stroke** patients involvement in goal setting and their participation in physiotherapy

Principal investigator – Andrea Shipley Research supervisor – Dr Fiona Jones

> Recent Government health policy has promoted patient self management, and the *National Clinical Guidelines for Stroke* (2008) encourages stroke patients' participation in decision making including goal setting. Holliday *et al* (2007) highlights the need to address the lack of evidence to support the importance of involving patients in goal setting.

#### AIM

To determine whether a relationship exists between how much stroke patients are involved in their physiotherapy goal setting and how much they participate in their physiotherapy sessions. This knowledge could contribute towards informing best rehabilitation practise around goal setting with stroke patients, especially as it has been already identified that greater participation in therapy results in a better outcome (Lenze *et al* 2004).

#### METHOD

The subjects were twelve people admitted to the stroke unit at Homerton Hospital with a new diagnosis of stroke causing a change in their physical abilities and a need for physiotherapy. Participants took part in the normal goal setting procedure on the unit with their physiotherapist. This was followed by each participant completing a Visual Analogue Scale (VAS) with the researcher about how much they felt involved in their goal setting. Individual physiotherapy sessions for each of the twelve subjects were then monitored and ratings given by their physiotherapist (blinded to their VAS score) for how much they participated in their physiotherapy.

Outcome measures included a 10 point rating scale measuring involvement in goal setting (VAS). Participation was measured by the physiotherapists using two scales: the Pittsburgh Rehabilitation Participation Scale (PRPS Lenze *et al* 2004) after each session, and; the Hopkins Rehabilitation Engagement Rating Scale (HRERS Kortte *et al* 2007) a summary scale rated on discharge. The Goal Attainment Scale (GAS) was used as the standard procedure for goal setting and monitoring goal achievement. Correlations were preformed on the outcome measures to see if any relationships were revealed

#### RESULTS

The statistical analysis of the relationship between stroke patients' involvement in goal setting and their participation in physiotherapy revealed a moderate correlation between these two variables from both participation scales. However neither of these correlations proved to be statistically significant at the P<0.05 level.

#### DISCUSSION

Involving stroke patients in decision making around their rehabilitation, (including those around goal setting) is encouraged and may assist with the move towards earlier discharge from hospital and the process of promoting self-management at home. The present study attempted to find an association between involvement in goal setting and participation in physiotherapy. A moderate correlation between the two primary variables was revealed but unfortunately we were unable to attach any statistical significance to this, possibly due to the small sample size and a number of uncontrollable variables.

#### CONCLUSION

This small scale study shows preliminary findings of a trend towards a possible association between stroke patients' involvement in goal setting and participation in physiotherapy.

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# SHARING GOOD PRACTICE One year on: personal experiences of ahp practice development in a community setting

**Sara McGowan** MSc Physiotherapy, Ad Dip in Health Service Research, Grad Dip Phys Senior Clinical Practice Facilitator, Camden Provider Services.

Practice development (PD) and Practice Development Units (PDU) are well established in the nursing profession (Williams *et al* 1993, McSherry and Warr 2006). However, the lack of papers in the Allied Health Professions (AHP) literature demonstrates that PD is not well recognised in the professions of physiotherapy, occupational therapy, speech and language therapy and podiatry. Indeed, I have been working as a physiotherapist since 1992 and have never come across the term myself until last year. I've had a lot to learn...

In April 2009, a Practice Development Unit was set up in a Community PCT in London with the aim of establishing effective clinical learning, evidence based practice and innovation in the clinical setting. In order for the Allied Health Professions (AHP) to be represented and to have a slice of the action (and the money), a post of eleven hours a week was established to work along side three others from a nursing background. My appointment was met with general enthusiasm by the AHPs although there was some confusion as to how this would affect their clinical practice. This short article aims to examine how PD activities fit with the AHP professional cultures.

#### **PRACTICE DEVELOPMENT**

There are many definitions of PD in the literature (Page 2001 and 2002, McSherry and Kell 2007), most agree that PD is a continuous process and has patient-centred care at the heart of its activities (Page 2000, McSherry and Warr 2006). Practice development draws on a variety of approaches, including quality improvement, evidence-based practice and innovation in practice (Page, 2000). In nursing, PD has been part of the culture since the late 1970's and early 1980's and has assisted the nursing profession to move from

a traditional culture of task-based practice to a more patient centred approach (McSherry and Warr 2006). Practice development is delivered in a variety of ways; Page (2001) outlines a framework where PD is delivered from individual clinicians to units or teams to supra-organisational networks such as the National Practice Development Forum. PD it seems can be 'whatever you want it to be' (McCormack 2008); it has often been described as a 'messy' process (McCormack et al 1999). It is not a linear or organised process such as a research project, but follows the needs of patients, clinicians and services. The aim therefore is to implement change at a local level but not to necessarily generate research which might have wider application (Gerrish and Mawson 2005). The outcomes from PD may be transferable to other similar settings if appropriate modifications are made. The findings though are not always generalisable and this maybe one of the causes of PD activities being sidelined in the evidence-based world of the NHS (Hoban 2007). PD professionals are often seen as change agents, assisting others to develop and transform services; because of this PD can often struggle to get clinicians on board with adapting to change. My experiences of this is that in eleven hours a week it has been difficult to become established and although sitting outside the services with whom I am working has some advantages, such as viewing situations more objectively, I am seen as an external changeagent, which can be viewed by some clinicians as interfering and challenging their professional autonomy. I have attempted to include and involve clinicians throughout the PD process, emphasizing the importance of working alongside each other and aiming to assist them in tackling relevant clinical problems. I have found that many clinicians are open to the idea of change and innovative ways of working but feel that they are so busy with normal everyday clinical activity and often

they are unable to take the time to even think about changing their practice.

# ALLIED HEALTH PROFESSIONALS AND PRACTICE DEVELOPMENT

When I started in my role, I posted a request on the interactive CSP website (www.icsp.org.uk) to establish whether any other physiotherapists were working in a practice development role. I had only one response from a physiotherapist working in Scotland. She described her role as more strategic, covering AHPs in a large region of Scotland, predominately planning and organising post-registration training. On further investigation, Scotland has a well established Practice Development Framework and AHPs appear to be well integrated in the process (Hoban 2007). The positioning of AHP Practice Development out of clinical practice is interesting as Higgs and Titchen (2001) in one of the very few AHP articles on Practice Development view PD as integral to clinicians' everyday practice. Specifically they state that professional knowledge is at the heart of practice development. Professional knowledge is described as theory-based and practice-based knowledge, where as the accepted nursing description of practice development centres upon change management and patient-centred practice. This opens up a professional cultural debate; are AHPs and our nursing colleagues talking about the same process? Indeed, are the individual AHP professions that I work with talking about the same process? This may explain some of my difficulties; some groups of AHPs are striving to assimilate research findings and evidence based practice in everyday practice as a matter of course, and may see formal Practice Development activities as unnecessary. A good example of this is how two clinicians in the Community Stroke Early Discharge Team are implementing the RCP Stroke *Guidelines* throughout their care pathway; this was a goal that they had themselves identified through audit and their yearly personal appraisal system. Another team needed some additional support from me to develop a clinical audit tool on Parkinson's disease and help to assimilate best practice guidelines in their own practice with minimal disruption to service. I've also had to acknowledge that some clinicians need more time to adjust to changes and that building trusting relationships has been my focus in order, in these instances to engage staff in the longer term. Indeed, McQueen (2008) describes the three year process of developing an OT research lead post. In this case study, the author outlines how the development of this post encouraged OT clinicians to engage more fully in the research process and evi-

dence-based practice. The post was developed into a Practice Development position, to reflect the variety of different activities the post-holder was engaged and the Trust had plans to recruit PD leads in PT and SLT. McQueen supports the idea that there is a place for specific research/practice development personnel supporting AHPs and this highlights the amount of time that is needed to affect change. This all comes at interesting times in the world of PD and the NHS; just as the AHPs appear to be starting out on a PD journey our nursing colleagues are questioning the validity and the purpose of the role (McSherry 2007, McCormack et al 2007, Walker 2008). Hoban (2007) states that there is a role for PD practitioners to encourage and develop ideas for innovation in the NHS modernization programme. Middleton (DH 2010) confirms that AHPs must see through innovative ideas and commit to change and that they are strategically well positioned to do this. This makes sounds sense, the potential of rebranding PD and positioning it in this arena may open up new funding streams and might just secure its future.

#### **STRATEGIES**

It has been difficult at times to engage AHP clinicians' enthusiasm and I have had to develop a variety of hooks to reel them in. The main one being the lure of funding for courses! The PDU in this Trust sits with the Learning and Development Department which is different from many of the PDU models in the literature, as often PDUs and Practice Facilitators work in service. One of the advantages of this arrangement is that it allows Practice Developers to work alongside experts in adult learning and improves access to learning budgets. If there is one thing that I've learnt over the past year is that AHP love to attend training courses! McCormack (2007) though warns that there is no evidence in the PD literature that formal training has a direct impact on practice this is a difficult message to get across to clinicians at a time when there has been a rush to complete and update CPD portfolios for auditing by the Health Professions Council. Certainly, changing and sustaining the change in clinical practice after attending clinical courses is a real issue and the challenge of measuring these changes still eludes me.

One of the main focuses of my role has been developing a training plan for the AHPs and then working with local Higher Education Institutions to develop bespoke training to fit specific learning outcomes as well as encouraging AHPs to access university accredited post-graduate CPD courses. I also assess applications for funding for clinical courses which has helped improve equity and transparency in the funding process for all clinicians throughout the trust. Interestingly, this is the aspect that I get the most positive feedback from clinicians.

#### **FUTURE DEVELOPMENTS AND CONCLUSION**

My personal experience of PD is only one year old but I can certainly agree with McCormack et al (1999) that it is a really messy process! Several weeks can go past with no observable change and then after chipping away, reading, researching and thinking suddenly the pieces fall in to place. Working along side nursing colleagues who have more experience of PD has been invaluable as has the support of the Learning and Development Team. My observations are that individual AHP professions and clinicians are at different stages of integrating evidence-based practice into everyday clinical work and that until teams and clinicians are doing this as a daily process there will always be a role for PD practitioners. Future developments and plans for my own role over the next year include encouraging AHPs to access university accredited courses for CPD where appropriate and to investigate how our PDU can assess more accurately the effect of training on clinical practice.

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Compiled by Dorothy Bowman ACPIN Scottish Regional Representative

The aim of this article is to give an overview and insight into some of the developments that are happening in Scotland at the moment. Thank you to all who contributed.

#### **A FEW FACTS**

Scotland has a third of the land mass of the UK (30,000 miles<sup>2</sup>) and a population of five million. The population is mainly in the cities which leaves huge expanses of beautiful wilderness to visit! There is 30,000 miles of coastline and 790 islands.

Large distances and the range of urban and rural populations is a challenge for the 15 Scottish Health Boards

The ACPIN Scotland committee meets approximately three times a year to arrange courses. We travelled over 400 miles to get to the last committee meeting.

#### **CONSULTANT PHYSIOTHERAPISTS IN STROKE**

Mark Smith- Consultant PT

Mark was appointed consultant AHP for Stroke Rehabilitation in NHS Lothian in 2006. There are four domains within the consultant role designed to achieve expert clinical practice

- Research
- Audit and practice development
- Education and development
- Professional and clinical leadership

He has worked in association with Lothian Stroke Managed Clinical Network (MCN) to scope and develop stroke services across Lothian. The emphasis of his work has been on community based aspects of stroke management after hospital discharge.

Pathway developments have included

- early supported discharge after stroke
- joint partnerships between health and social care and voluntary sectors after stroke

• developing fitness pathways in collaboration with the local leisure industry.

His educational activity is channelled mainly through the Lothian Stroke MCN and Queen Margaret University (QMU), teaching on under and post-graduate courses including the Exercise after Stroke Course for specialist exercise instructors.

Recent research has involved treadmill training after stroke, hemiplegic shoulder pain, central post-stroke pain, and sensory loss after stroke.

Mark sits on the ACPIN committee in Scotland to ensure that information is passed freely between the National Advisory Committee for Stroke (NACS) and the ACPIN membership. He also contributes to ACPIN courses and their development and takes a keen interest in neurological rehabilitation research in Scotland.

#### CONSULTANT OCCUPATIONAL THERAPISTS IN STROKE, MCNs\* AND THE CONSULTANT AHP ROLE

Therese Jackson Consultant OT

The Coronary Heart Disease and Stroke Strategy for Scotland (2002) recommended that each Health Board Area in Scotland should establish a Stroke Managed Clinical Network (MCN) for the coordination and development of Stroke Services by April 2004.

Each health board appointed a lead clinician and a network manager and along with an advisory group, sought to develop stroke services according to local need, and in line with recommended best practice, guided by national clinical guidelines and stroke standards.

NHS Grampian established a lead AHP post in

\*Managed Clinical Networks The definition of Managed Clinical Networks is 'linked groups of health professionals and organisations from primary, secondary and tertiary care, working in a co-ordinated manner, unconstrained by existing professional and Health Board boundaries, to ensure equitable provision of high quality clinically effective services throughout Scotland'. the form of a consultant occupational therapist in stroke in 2005. This post sits within the Stroke MCN and is part of the core team as well as a lead clinician, network manager, lead GP and stroke physician.

The remit of the post has evolved over the five years since I began and has established a key function in supporting and developing stroke services, particularly with AHPs and nursing services across the patient's pathway from acute to community. I will shortly be taking over as lead for our most recently opened stroke rehabilitation unit in North Aberdeenshire, demonstrating the value of AHPs in leadership roles

Education and training are an integral part of the post and close links with HEIs support integrated learning for all staff. Research and evaluation are a core role for me and integrating research into practice is included in many ways. Recently we have been established as a centre for a large multi centre RCT on stroke rehabilitation.

Clinical practice remains the core function of consultant AHP posts and the other functions support this in terms of expert practice.

Collaboration is always essential when developing stroke services and I value the joint working which we have established as a group of NAHP consultants in stroke in Scotland. This supports a national voice and it is evident when working on national projects and advisory panels that the AHP and nursing voice in stroke is very evident.

#### **STARS WEBSITE:**

#### Clare Adams Project Manager

In 2005 NHS Education for Scotland (NES) published the Stroke Core Competencies which set out the core knowledge and skills required by all staff that care for people affected by stroke. In 2008 the National Advisory Committee for Stroke identified training for staff working in stroke units as a priority for NHS Scotland as providing these staff with access to high quality training is likely to have the greatest benefits for stroke patients.

The Scottish Government provided funding to develop an eLearning resource which incorporated the stroke core competencies and more specialised resources aimed primarily at registered staff working in stroke services.

The STARs (Stroke Training and Awareness Resources) website provides an interactive way of learning where images, quizzes, animations and video clips are incorporated into a series of patient scenarios. The resource is *freely* available via the worldwide web and has two levels:

- Stroke Core Competencies
- Advancing Stroke Modules

Throughout the resource links to other learning and reference materials are provided. There are also optional tests which if successfully completed will be awarded with a certificate. Since it was launched in May 2008 the website has been accessed globally and receives on average 1000 hits per week. To date over 7300 certificates have been awarded: 57% to learners based in Scotland, 41% to those in England, Wales and Northern Ireland and 2% to international learners.

For further information please contact: Clare Adams, Project Manager clare.adams@chss.org.uk www.stroketraining.org

#### GRAMPIAN SERVICE DEVELOPMENT EARLY SUPPORTED DISCHARGE Joanne Shaw

In October 2009 an early supported discharge (ESD) team was set up in Aberdeen City for patients being discharged home from hospital following a stroke or traumatic orthopaedic event.

Evidence has shown that ESD can lead to shorter stays in hospital and improved clinical outcomes (*Better Heart Disease and Stroke Care Action Plan* 2009). An audit completed in 2008 by the Stroke Managed Clinical Network highlighted an ESD service would have been of benefit to 26% of stroke patients. Stroke patients in Grampian were also found to have twice the national average length of hospital stay.

The service is delivered by a multi-disciplinary team which consists of occupational therapy, physiotherapy, speech and language therapy and clinical support workers over a six week period. Patients are seen either on the day of discharge from hospital or within one day as appropriate to facilitate the transition between hospital and home. This meets CSP recommendations reported in *Moving on* (2010) for a seamless transition into community services which 'will result in better outcomes for stroke survivors and reduced readmission rates'.

Initially rehabilitation provided at home is of a similar intensity to that given in hospital to provide support when patients tend to feel most vulnerable, meet patient needs and achieve optimum outcomes.

During rehabilitation the team aim is to empower the individual and their carer towards self management by giving them relevant information, support and encouragement to take responsibility for their rehabilitation using goal setting as a key component. *Moving on* (2010) reports that 52% of physiotherapists felt improved patient outcome could be achieved with greater service personalisation. Therapy is individually tailored and focuses on helping them achieve their goals. Progress is reviewed with the patient who rates their satisfaction and performance for each goal on a regular basis using a model based around the *Canadian Model of Occupational Performance* (1997, as seen in Law *et al* 2005)

The CSP document *Aspiring to excellence* (2010) encourages patients and carers to be regularly consulted and their feedback used to direct service planning and development. The service encourages patients and carers to complete an anonymous questionnaire about their experience with the team on discharge and their recommendations used to make changes to service delivery whilst the local Patient Focus and Public Involvement Stroke MCN has been consulted regarding any new patient information.

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#### TELEMEDICINE

Scottish Centre for Telehealth (www.sct.scot.nhs.uk)

'Telemedicine is the provision of health care at a distance using a range of digital technologies'. This is a rapidly developing area in Scotland, particularly in providing medical expertise to rural populations eg teleneurology is being piloted where neurologists in the regional centre assess patients on Orkney Isles several hundred miles away. Similar projects are running where acute stroke patients can be assessed by a consultant stroke physician prior to thrombolytic treatment being commenced (where CT scanning is available).

#### **ALLIANCE FOR SELF CARE RESEARCH**

The Alliance for Self Care Research is a consortium of the universities of Aberdeen, Abertay, Dundee, Robert Gordon, St Andrews and Stirling and their local NHS organizations, including people living in major Scottish cities and some of the most remote areas in Europe. It includes leading researchers from nursing, midwifery and allied health, health services research, medicine, psychology and other social sciences. The Alliance has two main aims:

- To undertake rigorous research to provide an evidence base for 'enhancing self-care'
- To build capacity and capability amongst nurses, midwives and allied health professionals. Reference www.ascr.ac.uk

#### **CONSULTANT PHYSIOTHERAPIST IN MS**

Linda Miller

Linda Miller was appointed consultant physiotherapist in Multiple Sclerosis (MS) for NHS Ayrshire and Arran in September 2009.

The Ayrshire MS service is highly regarded in the UK and consists of a multidisciplinary team encompassing physiotherapists, specialist nurses, a MS specialist occupational therapist and psychologist and consultant in rehabilitation medicine. It is also home to one of only two Managed Clinical Networks for MS in Scotland. The MCN's main aim has been to integrate secondary care services with primary care, social care services and the voluntary sector by providing a structured programme of education which includes support/education programme for people living with MS and their carers

Linda has led the restructuring of the MS review clinics where she now undertakes stand alone routine review clinics for MS patients, leaving the consultant to deal with urgent reviews only. Underpinning this development has been Linda's successful completion of the Non Medical prescribing course in 2007.

Linda completed her MPhil in 2005, publishing work in TENS and Functional Electrical Stimulation (FES) in MS. Her current research activity includes:

- Principal investigator for a study evaluating the impact of a home based physiotherapy programme on patients more severely affected by MS
- A comparative study of the impact of two different types of FES on energy cost of walking
- A reflexology study in MS which started in April 2010

Regionally she is joint lead of the MS West of Scotland physiotherapy network who have worked on a number of projects including:

- Development of an MS Physiotherapy assessment pack
- A scoping exercise on current physiotherapy practice in spasticity management

She has recently been invited as a member of the advisory panel for the neurological services improvement programme at NHS QIS.

#### WEST OF SCOTLAND MS SERVICE

Jane Lough MS Specialist Physiotherapist

The West of Scotland MS Service provides a specialist care service for people with MS (PwMS), their families and carers who live within the West of Scotland.

The MS Service therefore works in conjunction with specialist inpatient and community rehabilitation services as well as local authorities and charitable organisations to provide appropriate care and support for people affected by MS who present with varying levels of disability and care needs.

The service currently consists of a designated team of healthcare professionals led by a lead clinician for ms, and includes an additional four consultant neurologists who have a clinical commitment to the service, an MS specialist physiotherapist, a senior 1 physiotherapist and two MS specialist nurses.

The key roles undertaken by the MS specialist physiotherapist are: providing specialist clinical input, which includes providing advice and support for people with MS and their carers; acting as an educational resource for professional and non-professional staff; ensuring *National Guidelines* and *Standards of care for people with MS* are implemented at a local level and audit and practice development. The senior 1 physiotherapist is responsible for delivering specialist clinics including FES; working jointly with the orthotic service in the management of complex gait disorders; assisting in the evaluation and development of the service and providing educational inputs as required.

Development activities undertaken by the service include mapping physiotherapy services provision and developing referral pathways for physiotherapy services across the west of Scotland; undertaking a scoping exercise of physiotherapy care within an established spasticity clinic and identifying gaps in the pathway of physiotherapy care and service provision; taking a lead role in the development of a pathway for intrathecal baclofen management; developing a pathway of care for patients requiring FES; working jointly with the orthotic service in Glasgow to develop an orthotic pathway and participating in the Therapeutic Exercise Working Group to establish a therapeutic exercise pathway, which includes people with MS

In 2002 the MS specialist physiotherapist established the West of Scotland MS Physiotherapy Network as a means of developing closer links with physiotherapists working throughout the West of Scotland. This Network consists of experienced physiotherapists working in neuro-rehabilitation across the West of Scotland who have an interest in MS. Activities undertaken by the group include:

- The development of an Assessment and Outcome Measure Pack for use by physiotherapists.
- Mapping MS physiotherapy services for patients with spasticity then subsequently undertaking a scoping exercise on the physiotherapy management of spasticity in people with MS.
- The group is currently involved in three projects; the development of a fact sheet for patients on spasticity, medication and local injection therapy; developing an education leaflet for carers on passive stretching and positioning and compiling evidence on exercise.

#### OTHER (SCOTTISH ) RESOURCES

NHS Quality Improvements Scotland (NHS QIS) aim to ensure integrated quality health care and have a wide range of best practice statements and guidelines eg Use of AFO following stroke, epilepsy, long term conditions, physical disability, stroke and heart disease • www.nhshealthquality.org

■ SIGN (Scottish Intercollegiate Guidelines Network) Range of guidelines on heart disease, cardiac rehab and early management of head injury. Hot off the press- updated Guideline No 118 Stroke Rehabilitation, Prevention and management of Complications and Discharge Planning Guidelines • www.sign.ac.uk

Co-ordinated, integrated and fit for purpose: A delivery Framework for Adult rehabilitation in Scotland • www.scotland.gov.uk

Self management and rehabilitation information, patient booklets, policy documents etc for MND, MS, PD, Stroke

 www.enablinghealth.scot. nhs.uk

Better heart disease and
 Stroke care action plan 2009
 www.scotland.gov.uk.resourse

- Online falls Community
- www.fallspathway. nhshealthquality.org
- www.fallscommunity. scot.nhs.uk

#### Long Term Conditions/ Self Management

The self management strategy for Long Term Conditions- *Gaun YERSELF* (translated as a shout of encouragement for someone to go for it!)

www.ltcas.org.uk

#### Huntingtons Disease

- www.hdscotland.org
- www.hdscotland.org/youth/

#### Head Inury

The Scottish Head Injury Forum • www.shif.org.uk

Neurological Alliance

 www.scottishneurological. org.uk

#### Communication

Communication Forum Scotland-An informal alliance of organisations representing people of all ages with varied

communication support needs.
www.communicationforum scotland.org.uk

#### MND MND

www.mndscotland.org.uk

#### 🔳 PD

 www.parkinsons.org.uk
 Branches in Scotland
 Sign Guideline 113-Diagnosis and
 Pharmalogical management of PD

www.sign.ac.uk

#### MS 🖉

www.mssocietyscotland.org.ukwww.revivescotland.org.uk

#### Exercise

• www.exerciseafterstroke.org.uk Best Practice guidelines out September 2010. **Manchester** Neuro Physio<sup>2</sup> provide a neurological physiotherapy service throughout Greater Manchester and Cheshire, are committed to excellence in patient care and provide clinic, home and hydrotherapy based treatments.

# Manchester Neuro Physio"

# **NEUROLOGICAL PHYSIOTHERAPIST VACANCY**

#### Neurological Physiotherapist required who would relish the opportunity to:

- ✓ Maintain a varied neurological caseload requiring varying levels of rehabilitation
- ✓ Earn £24 £33,000 pa
- ✓ Focus fully on treatment
- ✓ Provide patients with regular quality treatment based over extended periods
- ✓ Work (and learn) with other senior neuro-physiotherapists
- ✓ Work with a group of dedicated and enthusiastic patients
- Attend relevant courses
- Treat patients at a variety of locations home, clinic and in the hydrotherapy pool

#### You must be:

- ✓ Three years qualified
- ✓ Committed to team working
- ✓ Enthusiastic
- ✓ Motivated
- ✓ Organised
- ✓ Willing to work in various locations
- ✓ A car owner

For more information about us please visit www.manchesterneurophysio.co.uk/careers

For a job description & personal specification please call Katy Crawley on 0161 905 1363.

To apply please send your cv and a covering letter to **office@manchesterneurophysio.co.uk** 

# **FIVE MINUTES WITH...** ALASTAIR CAMPBELL

This year's Founders Lecture speaker at Congress spared a few minutes to ponder a few questions...

# In your experience are there any similarities between physios and politicians?

Politicians are not that different to any other walk of life. You get good, bad, indifferent; hardworking and lazy (more of the former I think); brilliant and sometimes not so clever. The big difference is the scrutiny, particularly in the 24 hour media age, and the importance of the decisions, which can affect everyone in the country and often beyond. The main similarity is that both are engaging in public service.

#### What did your achievement in receiving *Mind Champion of the Year 2009* mean to you personally?

I was very proud, not least because it was voted by the public. I have always been open about my own history of mental health problems and I think that this was a recognition that in being open, and in writing my novel and doing my film on my own breakdown, I had hopefully been able to help some individuals but also help break down the stigma and taboo surrounding mental illness.

#### All in the Mind – your novel about mental illness, portrays the darker side of depression. Is there a message for physiotherapists here?

Part of my inspiration for the novel was thinking about what it must be like for the psychiatrist to be a repository of so many different mental problems, if at the same time they had their own problems and issues. We all have mental health, just as we all have physical health, and sometimes it is better than at other times. The question 'who heals the healer?' is an age old one and it is at the heart of *All In The Mind*. So I suppose the message is maybe less for the physios than for the people you care for. We cannot see our healers as magicians. They are people the same as the rest of us.

# What are your aspirations for the future of care for mental illness?

I would like to be able to get to a position where people feel they can be as open about mental health as they are about physical health. If someone breaks a leg, we know how to react. If we hear someone has cancer, we know how to react. These are out in the open. But discussion about mental health is still a little bit back of hand, side of mouth, whisper so nobody knows. Openness breeds greater understanding and greater understanding should lead to better care. To be frank, with the cuts programme I am worried that mental health once again becomes a Cinderella service in the health service. Labour had a good record in this area and I fear it will be reversed.

# **NEWS ACPIN**

#### ACPIN membership registration and renewal 2011

For all new and returning members of ACPIN.

- Online registration and renewal for 2011 opens early January.
- Payment can be by cheque or direct debit.
- Members who pay by direct debit MUST go online each year to update their details as 'Renewals'. You are not valid for 2011 until this is completed.
- Questions? Email Sandy Chambers, Membership Secretary, at memsec@acpin.org

#### ACPIN Private neurophysiotherapist register to be discontinued

After many good years of service, the ACPIN National Committee has agreed that from January 2011 we will no longer be supporting a registry of ACPIN members who work privately. The ACPIN Private Register was established to support ACPIN members as well as to provide a point of therapy access for people with neurological injury and disease when internet resources were still in their infancy.

However, with the success of the Chartered Society of Physiotherapy 'Physio2u' resource, the Committee see the ACPIN Private register as a duplication of services that members already pay for. We hope our members who treat patients privately will find that registering with Physio2U is equally as useful as the ACPIN list. From January 2011, there will no longer be the facility during online registration or renewal to submit your name for a private ACPIN register.

#### **CALL FOR POSTERS**



#### ACPIN NATIONAL CONFERENCE 19 MARCH 2011 HILTON HOTEL NORTHAMPTON

Do you have a piece of work exploring the relationship between the mind and the body? Have you had to tailor an exercise class or information leaflet to facilitate use by those with cognitive problems? Do you have experience with conversion disorder that you would like to share with your colleagues via a case study? Have you found that a particular form of feedback works particularly well? Have you completed a pilot study or audit perhaps? Are you a post-graduate student or recently graduated Physiotherapist who would like to share the results of your dissertation? Then this is the forum for you.

Posters will be displayed during the conference. A £50 book token will be awarded to the best as judged by a selected panel. A further £25 prize will be awarded for the best clinical poster.

It really is not as daunting as you think and may help you achieve your KSF requirements! Advice and support can be offered in the development of your idea although ACPIN cannot print the posters themselves. Please see the Spring 2010 edition of *Syn'apse* for further guidance on preparing a poster.

Please contact Julia Williamson (Hon research officer) via: Julia.Williamson@nuth.nhs.uk for additional information.

**Deadline for expressions of interest**: 18th February 2011.

If you wish your abstract to be included in the Spring 2011 edition of *Syn'apse* it must be submitted to Julia Williamson also by 18th February 2011.

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# ACPIN @ CSP Congress 2010



15–16 OCTOBER 2010 BT CONVENTION CENTRE LIVERPOOL

A sample of topics covered in the neurology strand of this year's Congress

# From muscles to the mind: multi-system benefits of exercise in stroke

#### Professor Janice Eng

Health Research Coordinator, Office of the VP Research & International, University of BC

The session will describe recent randomized controlled trials developed by Professor Janice Eng which use innovative methods to deliver exercise therapies in the stroke population to improve walking, hand and arm function, cognition and reduce risk of secondary complications of heart disease and fractures. This lecture will present the research evidence, as well as discuss practical tips to ensure that these programs address the targeted health domains, and promote adherence to them.

Stroke is the leading cause of longterm disability with a lifetime risk of stroke of one in five in women and one in six for men at age 55. The stroke event causes a number of functional limitations which include muscle weakness, pain, spasticity, cognitive dysfunction and poor balance. The burden of these impairments, combined with a subsequent reduction in activity can then lead to a vicious cycle of decline in function and disability status. Given the potential of exercise to positively influence multiple physical and psychosocial domains, we customized exercise programs for people living with a stroke to address the multiple impairments arising from this health condition. These customized exercise programs have shown a range of benefits, peripherally from the muscles to centrally with memory and cognition. For example, our team developed the group Fitness and Mobility Exercise (FAME) Program. Key components of the program include agility training,

cardiovascular targets, functional strengthening and weight-bearing. Randomized controlled trials demonstrated that the FAME Program improved mobility (gait speed, Six Minute Walk Test), leg postural reflexes, cardiovascular fitness (VO2peak), bone health (hip bone density), memory (Rey Auditory Test), executive function (Stroop Test), as well as reduced falls. We recently developed a self-directed arm and hand exercise program called the Graded Repetitive Arm Supplementary Program (GRASP). This low cost program demonstrated positive effects on arm function and everyday use of the hand. It also reduced depressive symptoms in people with stroke. Both FAME and GRASP incorporate a number of practical strategies to promote adherence to exercise. These successful interventions highlight the need for new models to deliver more exercise (and more intense activities) in the stroke population.

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#### Biography

Janice Eng, PhD, PT/OT is Professor, Department of Physical Therapy, University of BC and Scientist at the GF Strong Rehab Centre in Vancouver, Canada. She trained as a physical therapist and occupational therapist prior to undertaking a masters degree in Biomedical Engineering, PhD in kinesiology and post-doctoral fellowship in neurophysiology. She has received a life-time of peer-reviewed external operating funds of over \$7 million Canadian as principal investigator and has published over 100 peer-reviewed journal articles. She has developed innovative rehabilitation exercise interventions and has undertaken randomized controlled trials to demonstrate their effectiveness in improving mobility, fitness, bone health, cognition, upper extremity function and quality of life in people with neurological conditions. She is the co-leader of the Spinal Cord Injury Rehabilitation Evidence (SCIRE) project which has served as a platform for initiating several novel international knowledge translation projects in spinal cord injury. In 2009, she was inducted as a Fellow of the Canadian Academy of Health Sciences.

# NICE guidelines for spinal cord metastases in practice

#### **Helen Tyler**

Metastatic Spinal Cord Compression (MSCC) is defined as spinal cord or cauda equina compression by direct pressure and/or vertebral collapse or instability by metastatic spread or direct extension of malignancy that threatens or causes neurological disability.

There are approximately 4,000 cases of MSCC a year and 50% of these patients present 'off their legs' of which only 20% will achieve functional walking. Of the 50% of patients who present 'on their legs', 80% of these achieve functional walking. It is therefore important to recognise the impact of an MSCC diagnosis on patients and their families and carers. Delays in diagnosis, treatment and care may result in avoidable disability and premature death.

This session highlights the process of writing the MSCC NICE guidelines and explores the resulting key priorities and recommendations to ensure that facilities are made available for early diagnosis and that treatment is coordinated to prevent, where possible, paralysis and reduction in the patient's quality of life.

The specific focus of rehabilitation from a physiotherapy perspective

should commence on admission taking into account patients' individual needs with the goal of improving quality of life, so that patients can function at a minimum level of dependency, regardless of life expectancy.

Acute and ongoing rehabilitation should monitor spinal stability while achieving the patient's maximum potential across the eight domains of cancer rehabilitation.

#### Biography

Helen qualified from the Cardiff University as a chartered physiotherapist in 1978 and worked for two years at the University Hospital of Wales before specialising in paediatric physiotherapy. Following a career break she returned to work as a part-time lecturer in Further Education for 13 years, teaching anatomy, physiology, massage and exercise. She then combined the education role with clinical physiotherapy, working as a part-time physiotherapist in oncology and palliative care at the Velindre Cancer Centre and following completion of a PGCE, joined Cardiff University as a part-time lecturer in physiotherapy. She then specialised in oncology and worked full time as Clinical Lead Physiotherapist until 2005 when she became Therapies Manager at the Cancer Centre. Her responsibilities as Therapies Manager bring together the Physiotherapy, Occupational Therapy, Dietetics, Speech and Language Therapy, Lymphoedema service and Complementary Therapies departments to provide an integrated approach to support and rehabilitation for cancer patients.

# The difference that words make – communication skills for physiotherapy

**Dr Ruth Parry** PhD, MMedSci, MCSP Senior Research Fellow, University of Nottingham

There is strong evidence that the content and the form of clinicians' communication with their patients directly affects the quality and outcomes of healthcare. However, our understandings about communication and its structures and functions fall far behind understandings in areas such as anatomy, physiology and pathology. This makes it difficult for us to reflect on, design and change aspects of healthcare communication.

I will describe some recent advances

in understandings about the structures and functioning of healthcare communication. In particular I will focus on a growing body of research that uses an approach known as 'conversation analysis'. I will describe how this approach provides a particularly useful framework for thinking and learning about our own and others' communication skills. I will also describe some specific research findings about communication skills that are relevant in both neurological and other areas of physiotherapy practice. Drawing on my own research in physiotherapy and on research from other settings, I will describe findings about practices for encouraging patients' involvement in consultations; for dealing with resistance to recommendations: and for conveying information to patients about reasons underlying treatment recommendations.

#### Biography

Ruth worked as an NHS physiotherapist for a number of years, specialising in healthcare for older people and neurological rehabilitation. She moved into research, initially working on a randomised controlled trial of a rehabilitation intervention. She then began a series of video-based studies about communication during physiotherapy treatment sessions, and continues to work on healthcare communication. She has published her findings in sociological and clinical journals and written for qualitative research textbooks. She supervises PhD students' research into healthcare communication, and teaches qualitative research methods at Masters level. She recently began working as a senior research fellow within the Supportive and Palliative Care Research Group within the School of Nursing, Midwifery, and Physiotherapy at the University of Nottingham.

## Stroke networks in practice

#### **Ms Adine Adonis**

Clinical Specialist Physiotherapist, St Mary's Hospital, Imperial College, London

The advent of Stroke Clinical Networks have engaged clinicians, managers and commissioners and assisted in increasing the quality of patient care in stroke. The networks play an important role in enhancing the good work already out there, as well as actively engaging stakeholders across the patient pathway, keeping the patient at the centre of developments.

The session will aim to explore the opportunities ,challenges and practical applicability of working with the Stroke Clinical Network

#### **Biography**

Adine has been qualified and practising in the field of neurophysiotherapy for more than ten years. Her role is as a clinical specialist neurophysiotherapist at St Mary's Hospital, Imperial College, where she works in a specialist clinic for patients with HTLV (Human T-Cell Lymphotrophic Virus) associated myelopathy, as well as working on the wards. She is also the clinical lead for the NWL Stroke and Cardiac Network's Stroke Rehabilitation Workstream. Her research passion has been sparked by working in the HTLV clinic and she is currently the lead on a research project around goal setting in the acute environment.

## Falls, disability, mood and physical activity in community stroke survivors

#### Karthikeyan Muthumayandi

**Purpose** This study investigates falls among the stroke population in the community and explore the relationship of falls and the risk factors of falls.

**Relevance** Falls in stroke population reduces the life expectancy and affects quality of life.

**Participants** 102 subjects participated in the study with mean age 73.3±11.3, Male 58, right side stroke 37, bilateral 2, mean duration after stroke 2.1 years.

Methods Cross-sectional postal survey was used. Postal questionnaire containing Barthel Index (BI), Hospital Anxiety and Depression Scale (HAD), sub score of the Frenchay Activity Index (FAI), medication and information regarding falls was sent to 212 stroke survivors in the community. 102 subjects responded.

**Analysis** Participants were grouped as Non-Fallers(NF, n=50), Single-Fallers (SF, n=17), Multiple-Fallers(MF,n=18) (2– 4) and High-Frequency Fallers(HF, n=17)( $\geq$ 4). Analysis of Variance and Chi square test for subjects demographic data, Kruskal– Wallis test for between the groups, Spearmans coreleation statistics to find the relationship between risk factors and odds ratio for medication were administered.

**Results** 51% have had at least a single fall, 34% had more than one fall. 47% of the stroke fallers were either depressed or borderline. Significant difference (P<0.05) was found between the groups (NF,SF,MF & HF) in HAD-Depression. Scores (5±4.48, 5±3.18, 9±3.24 and 10±3.56 respectively), BI(18±3.35, 17±5.2, 16±4.45 and 9±6.59 respectively) and FAI (19±8.7, 13±8.7, 12±6.2 and 5±10.8 respectively. The number of falls had a weak correlation with HAD score r=.31 P<0.01) negative correlation with BI(r=0.28, P<0.01) and FAI(r=.24, P<0.05). Negative Correlation between BI and FAI with HAD Score (r=-0.413 and -0.459 respectively, P<0.05)was observed.Two hip fractures were reported.

**Conclusions** Falls in community living stroke subjects are high and need to be addressed. Fallers are more depressed, disabled and less physically active.

**Implications** Fall prevention should not only be included in discharge planning but also at every follow up review and visit. Associate factors should be considered in developing fall management programme.

#### Biography

Karthik is a full time post graduate research student form Newcastle upon Tyne. Karthik qualified at Dr M.G.R Medical University in 1998 and gained experience working as a lecturer at Nandha college of Physiotherapy, India from 1998 to 2000. He completed his Masters of Physiotherapy (Neurology) in Hamdard University, New Delhi in 2002. He was the in charge at the Neurological rehabilitation programme at Asia's largest Indraprastha Apollo hospital, New Delhi. He is yet to complete his post graduate research degree from University of Northumbria, United Kingdom. His research interests are in joint replacements, physical ambulatory activity monitoring, kinematics gait analysis and falls.

# Movement-related activation patterns in deep abdominal muscles following acute stroke

#### Professor Jonathan Marsden

Professorship and Chair in Rehabilitation, School of Health Professions, University of Plymouth

**Purpose** To investigate activation patterns in two deep abdominal muscles after acute stroke.

**Relevance** Following stroke, impairments in trunk control are common and significantly impact on functional ability. In non-human primates there are bilateral projections to trunk muscles from both brainstem and motor cortex. This suggests that supratentorial stroke should only have minimal impact on muscle trunk activation contralateral to the lesion.

**Participants** Ten people with an acute supratentorial stroke (< 3 months) were recruited from a specialist stroke inpatient unit; and ten healthy controls.

Methods Fine wire needles (50mm, 25ga, Motion Lab Systems, USA) were inserted under ultrasound guidance into transversus abdominus (TA) and internal oblique (IO) muscles bilaterally. EMG activity was recorded while participants flexed either their left or right hip (60 to 900) or flexed their head against gravity.

**Analysis** EMG signals were filtered and rectified and the mean amplitude of response recorded.

**Results** Ten people with acute stroke (nine female, mean 73.6 +/- 9 yrs) and 10 matched elderly participants (70.2 +/- 7 yrs) were recruited. There was no significant difference in the amplitude of TA and IO activation between the side ipsi- and contra-lateral to the stroke. The degree of muscle activity was modulated by task; during hip flexion TA activity was highest when moving the ipsilateral leg; IO activity on both sides was highest when moving the hemiplegic leg.

**Conclusions** The lack of difference in deep abdominal muscle activation between the two sides following stroke

may reflect the presence of bilateral descending pathways from the motor cortex and/or brainstem. Higher IO activity when moving the hemiplegic leg may reflect different mechanisms including overflow of muscle activity or compensatory pelvic movements.

**Implications** Early intervention to increase deep abdominal muscle activity may enhance lower limb movement in people with supratentorial stroke.

#### **Biography**

Jon Marsden qualified as a physiotherapist in 1991; he undertook clinical rotations at the United Bristol Healthcare trust and the National Hospital for Neurology and Neurosurgery in London. From 1999 he worked as a postdoctoral scientist in the Sobell Department for Motor Neuroscience and Movement Disorders, UCL investigating the pathophysiology and rehabilitation of walking and balance following peripheral and central nervous system damage. Since 2007 he has been Professor of Rehabilitation at the School of Health Professions, University of Plymouth.

# Investigating the effects of bilateral functional electrical stimulation for foot drop in people with hereditary spastic paraparesis

**Professor Jonathan Marsden** Professorship and Chair in Rehabilitation, School of Health Professions, University of Plymouth

**Purpose** This study investigated the short term effects of functional electrical stimulation on walking in people with hereditary spastic paraparesis (HSP)

**Relevance** People with HSP have difficulties with balance and walking and often trip due to poor clearance of the foot.

**Participants** Eleven people with HSP were assessed (57 ±14.2 yrs mean ±SD; nine male) and compared to eleven matched controls (56.4 ±8.0 yrs).

**Methods** A convenience sample of long term users of FES (>0.5 yrs) was used. Ankle kinematics while walking was measured using a 3D motion analysis system (CODAmotion).Participants with HSP were tested either without any FES (NONE), with bilateral FES to the common peroneal nerve (BIDF) or with their prescribed pattern of stimulation (PRES). The order of testing was randomised between participants. The walking speed, kinematics and physiological cost index was assessed over 10m. Additionally, participants rated the perceived effectiveness of the usual stimulation and degree of discomfort on a visual analogue scale (VAS).

**Analysis** Differences between conditions were measured using a repeated measures ANOVA.

**Results** People with HSP had used FES for 2.6 yrs ( $\pm$ 1.6). On a 10 point visual analogue scale they rated its' effectiveness as 7.5 ( $\pm$ 3 median  $\pm$  interquartile range) and discomfort as 0 ( $\pm$ 1). BIDF resulted in a 7.0 o  $\pm$  2.1 increase in the range of dorsiflexion in midswing (P<0.01). Walking speed increased compared to NONE (23.7 m/min) (ANOVA P<0.05) There was no significant change in the PCI.

**Conclusions** FES is generally well tolerated, can improve foot clearance and lead to a change in walking speed.

**Implications** FES for bilateral foot drop may be a useful adjunct to treatment in people with HSP.

**Biography** See previously.

# Comparing gait performance of people with Charcot-Marie-Tooth disease who do and do not wear ankle foot orthoses

Dr Gita Ramdharry

**Purpose** This study explores the differences in presentation and gait performance of a group of people with CMT (pwCMT) who regularly wore AFOs (pwCMT+AFOs) and a group who didn't (pwCMT-AFOs). Relationships between gait performance and impairments were also investigated. **Relevance** The factors that influence walking ability are not yet clearly established in people with Charcot-Marie-Tooth disease.

**Participants** Eleven subjects wore various types of AFO for daily mobility and 21 did not.

Methods Primary measures of gait performance were taken using a 10m timed walk (comfortable and maximum speed) and six minute walk test. Secondary measures included disease severity (CMT Examination Score); lower limb muscle strength (hand-held dynamometry); sensory impairment (light touch and vibration threshold); modified physiological cost index (PCI) and Borg perceived exertion during the six minute walk. Additional measures of fatigue severity and perceived walking ability were measured using the FSS and Walk-12 questionnaires.

**Analysis** T-tests – comparing group means. Pearsons and Spearmans correlations – exploring relationships between the variables. Significance P<0.05.

**Results** The AFO group had a slower maximum walking speed and higher effort of walking. They also had greater disease severity, perceived greater walking difficulty and were significantly weaker in the proximal and distal lower limb muscles. PwCMT who did not wear AFOs showed significant relationships between gait variables and lower limb muscle strength. The group who did wear AFOs showed significant relationships between gait variables and the Walk-12.

**Conclusions** This analysis indicates that more severe pwCMT tend to use AFOs. Gait performance of pwCMT-AFOs is determined by lower limb muscle function whereas gait performance of pwCMT+AFOS is determined by perception of walking difficulty.

**Implications** The support of the AFOs may reduce the impact of muscular function on gait performance, which could be influenced by more central factors.

Biography

None available.



# Outcome measures in neurological rehabilitation

**Prof Sarah Tyson** PhD MSc Professor of Rehabilitation, University of Salford

Use of standardised measurement tools is considered an integral part of the physiotherapy assessment process and part of good quality care but there are many barriers which hinder their use in every day practice. In this presentation Professor Tyson will draw on the work of her own and others to consider the theory, politics and evidence relating to the use of outcome measures in neurological rehabilitation. She is to address what needs to be measured, why, how and what difference it might make.

#### Biography

Sarah Tyson is Professor of Rehabilitation in the School of Health, Sport and Rehabilitation at the University of Salford where she leads the neurological rehabilitation research programme. Her work on clinical measurement tools involves a wide range of methodologies to develop new ones and explore how they are used in clinical practice. She has over 60 publications and £3million of research funding from the Department of Health, research councils, medical charities and professional bodies. Outside the University, Sarah is President of the Society of Research in Rehabilitation and the Physiotherapy Research Society, Chair of the North West Stroke Research Network's Steering Group, an associate faculty member of the National Institute of Health Research and works closely with the Greater Manchester and Cheshire Cardiac and Stroke Network to re-design and improve stroke rehabilitation services.

# Group circuit training for balance and mobility in people with MS: feasibility and clinical relevance

Dr Sheila Lennon

Senior Lecturer (Rehabilitation Sciences), University of Ulster (Northern Ireland)

**Background** People with MS (40–60%) frequently report balance and mobility problems (RCP/MS Trust 2006). There is strong evidence in favour of exercise in terms of impact on mobility (Rietberg *et al* 2004), but limited evidence for exercise in a community setting. Furthermore evidence suggests that exercise can improve aerobic capacity (fitness), muscle strength, fatigue, mood, mobility (similar effect sizes to disease modifying drugs–0.19) and quality of life (QoL).

This presentation will discuss the feasibility issues of conducting group exercise therapy in the form of circuit training with people with MS as a realistic model of service delivery in the NHS.

**Aim** This ongoing randomised controlled trial (RCT) aims to determine the effect of a group circuit training class on balance, mobility, self-efficacy and quality of life in people with MS.

Methods Recruitment of participants began in January 2008. Suitable participants are screened, and stratified according to the Rivermead Mobility Index (RMI), then randomised to a control group or to group circuit training (MSBM group). The control group receives a weekly telephone call, and the MSBM group attends a two hour exercise class biweekly for six weeks. Outcome assessments are completed at baseline, post intervention, three and six months follow up by a masked assessor. The primary outcome measure is the Rivermead Mobility Index, along with a range of secondary outcome measures.

**Results** Over 380 people with MS have expressed an interest in the study; 129 of these have been enrolled in the trial (34%). To date 14 groups have been conducted. Major reasons for non participation include the unsuitable



timing of the class (19%) and an inability to commit for 6 weeks (14%).

#### The participants' perspective

Participants record their own progress. Goals are participant orientated. Participants are taught how to progress simple exercises at home. Preliminary analysis of exit questionnaires has been overwhelmingly positive with 88.5% of participants reporting that the classes were beneficial. Four focus groups have been conducted. The main benefits reported are: professional supervision, peer support, increased confidence and taking control.

**Conclusion** Trial recruitment is ongoing until summer 2011. Feedback from the participants is positive, and we have rich data on falls for further exploration. A manual has been developed to support therapists in delivering this intervention. The findings of this adequately powered RCT will add to the limited evidence base for group exercise therapy for people with MS in the community in a format which can be delivered in a resource efficient way to improve accessibility to therapy. This trial is funded by the Public Health Agency in Northern Ireland.

#### Biography

Sheila Lennon qualified as a physiotherapist at McGill University in Canada in 1979. She has worked in neurorehabilitation in Canada, Switzerland, and England moving from her superintendant's post at Guy's Hospital in London to teach at the University of Ulster in 1992. She is a senior lecturer in the Health and Rehabilitation Sciences Research Institute at the University of

Ulster in Northern Ireland, she has been awarded more than £700,000 of external funding investigating exercise therapy for people with stroke and multiple sclerosis, and is the author/editor of over 70 publications including a new Pocketbook of Neurological Physiotherapy with Professor Maria Stokes published in January 2009. Sheila was the lead physiotherapy representative on the UK Intercollegiate Working Party for Stroke up until December 2009, and has been involved in all three editions of the National Clinical Guidelines for Stroke (UK). She is the Chief Investigator of AVERT, the very early mobilisation trial for stroke, in Northern Ireland, and is joint clinical lead with Dr Michael Power, for the NI Clinical Research Network (Stroke).

# Factors influencing the applied torque during manually applied plantarflexor stretches in people with MS

Jodielin Hall

#### Purpose

The torque that people with multiple sclerosis (pwMS) apply during manual stretches of the ankle plantarflexors was investigated.

Relevance 80% of pwMS have an increase in muscle stiffness caused by changes in passive stiffness and/or spasticity. Increases in stiffness are commonly managed with stretching. There is minimal evidence about the stretch-related parameters that effectively reduce stiffness.

**Participants** Participants with clinically defined multiple sclerosis (n=16; age 53.9yrs ±8.7 EDSS 4.5-7) who self reported leg stiffness were recruited.

**Methods** Four stretches were investigated: stretching in step standing (WALL); stretching off a step (STEP); pulling the ankle into dorsiflexion (PULL) and standing in a frame (FRAME). Joint position and the forces applied through the foot were measured using 3D motion analysis and torque transducers. Ankle stiffness ( $\Delta$ torque /  $\Delta$ position) was measured by passively moving the ankle into plantarflexion using a motor. Slow (5 deg/s) and fast stretches (170 deg/s) were used to quantify the degree of passive stiffness and stretch reflex activity.

**Analysis** Differences in the applied torque were determined using a repeated measures ANOVA. Correlations assessed the relationship between the applied torque and the degree of stiffness.

**Results** Ankle torque and the degree of dorsiflexion was higher during the WALL and STEP stretches (P<0.001). The degree of knee flexion was greater during the WALL stretch (p<0.001). People with greater stretch reflex activity applied lower torques in the STEP stretch (R2=0.25 P<0.05).

**Conclusions** Differences in the degree of knee flexion with stretching suggest differential targeting of the soleus and gastrocnemius muscles. Future work will investigate the effectiveness of the applied torques in decreasing muscle stiffness.

**Implications** There is a difference in applied torque and muscles targeted in commonly prescribed plantarflexor stretches. The torque applied may be influenced by the degree of spasticity.

#### Biography

Jodielin Hall studied for a degree in physiotherapy at Brunel university London from 2006–2009. She graduated in 2009. She is currently working as a PhD student and research assistant at the University of Plymouth on an MS society grant entitled *Establishing clinical guidance for stretching in people with Multiple Sclerosis*.

## Psychometric evaluation of the Arm Activity measure (ArmA) – a measure of active and passive function in the hemiparetic arm

#### **Mr Stephen Ashford**

Clinical Specialist and Research Physiotherapist, North West London Hospitals NHS Trust and King's College London

This presentation examines the psychometric measurement properties of the Arm Activity measure (ArmA), a measure of active and passive function in the hemiparetic upper limb. Evaluation was undertaken in a cohort of 92 participants with hemiparesis affecting upper limb function. Internal consistency and test re-test reliability was supported for both sub-scales. Validity was also supported and unidimensionality confirmed. The ArmA measure is appropriate for use in clinical practice and research settings.

**Purpose** To evaluate the psychometric properties of the ArmA, a patient reported outcome measure.

**Relevance** Goals for rehabilitation of the hemiparetic upper limb may be:

- to restore active function, if motor control is possible or
- to improve passive function making it easier to care for the limb (eg maintain hygiene) if no motor return is possible.
- The ArmA was developed following a systematic review. Item reduction was undertaken using modified Delphi consensus, followed by a wider survey of clinicians and pilot testing.

**Participants** Patients undergoing spasticity management intervention (n=92).

Methods Psychometric evaluation conducted with multiple base-line to enable reliability evaluation and 8week follow-up to evaluate responsiveness. Botulinum toxin-A and physical therapy interventions were applied to enable responsiveness evaluation. The cohort study is reported separately. Analysis Psychometric properties explored included; reliability (internal consistency and test-retest), validity (construct, content and homogeneity of measurement items), responsiveness to change and feasibility of the ArmA passive and active function sub-scales in clinical practice.

**Results** Reliability: Cronbach's alpha for both sub-scales were >0.85; weighted Kappa values were >0.90 for both sub-scales.

- Validity: Construct validity confirmed during measure development.
   Convergence and divergence established with comparison measures.
   Homogeneity was evaluated using principle component analysis – single components identified in each sub-scale and Mokken analysis – ltem H>0.5 for all items.
- Responsiveness: Significant change demonstrated from baseline to 8 weeks (Z=-2.1; p<0.05), correlated to Goal Attainment Scaling (0.37; P<0.01).</li>
- Feasibility: Respondents found the ArmA relevant (77%), easy to use (90%) and timely to complete (83% under 10 minutes).

**Conclusions** The ArmA is a psychometrically sound measure for active and passive function assessment.

**Implications** The ArmA can be applied in research and clinical settings following focal interventions in a low impact manner.

#### Biography

Stephen trained in Physiotherapy at Salford University and qualified in 1993. In 1998 he completed an MSc in Neurorehabilitation at Brunel University. Subsequently became part-time lecturer and course director for the MSc Neurorehabilitation at Brunel University from 2001 until 2003, while also working clinically. Since 2003 Stephen has been full-time clinical specialist and research physiotherapist at the Regional Rehabilitation Unit, Northwick Park Hospital and Honorary Research Fellow, Department of Palliative Care Policy and Rehabilitation, King's College London. Stephen is currently completing a PhD at King's College London investigating the measurement of arm function following focal interventions, such as botulinum toxin. Stephen has published a number of peer-reviewed papers in the rehabilitation literature as well as book chapters and clinical guideline contributions.

# Prisms In neurorehabilitation

#### **Dr Tom Manly**

Unilateral spatial neglect is a surprising and surprisingly common consequence of brain injury in which people find it difficult to notice or act on information from one side of space. Its presence is associated with slowed recovery. including in motor function. Patients are often perceived as 'hard to rehabilitate' and may be excluded from physiotherapy research trials. Here I will discuss six different rehabilitation techniques aimed at reducing spatial neglect and therefore, by inference, ultimately improving motor and functional outcome and discuss what the effect of these interventions tell us about this strange condition.

#### Biography

Dr Tom Manly is a clinical psychologist specialising in neuropsychology. He works at the Medical Research Council Cognition and Brain Sciences Unit in Cambridge. His research focuses on the nature, clinical assessment and rehabilitation of attentional and executive impairments, including in people who have had stroke, brain injury and children with developmental disorders. He has published many papers and chapters on these topics and is an author of the Test of Everyday Attention for Children (TEA-Ch) and Sustained Attention to Response Test (SART). In 2007 he was awarded the Elizabeth Warrington Prize by the British Neuropsychological Society for an outstanding contribution to neuropsychology at an early career stage and in 2008 he was awarded The British Psychological Society's Spearman Medal for an outstanding contribution to the psychological literature. He is not a physiotherapist ... but knows some!

# Robotics to replace physiotherapist in the treatment of UL post stroke?

#### Karen Baker

Research Physiotherapist, Institute of Neurology, UCL, London

Over the past five years there has been an exponential increase in the amount of literature related to the use of robotic aids in upper limb rehabilitation following stroke. This presentation will explore the current clinical trials that have been performed which look at this novel adjunct to therapy. It will discuss the advantages and disadvantages of the use of robotic devices. Ongoing trials that are using robotic devices will be mentioned. The session will hope to answer the question: Are robots going to replace physiotherapists in the treatment of the upper limb post stroke?

#### Biography

None available

# Translating knowledge and beyond in spinal cord injury rehabilitation

#### Professor Janice Eng

Health Research Coordinator, Office of the VP Research & International, University of BC

This session will discuss the Spinal Cord Injury Rehabilitation Evidence (SCIRE) which is an international collaboration and synthesis of the research evidence underlying outcome measures and rehabilitation interventions to improve the health of people living with SCI. Given the documented gap between what care people should receive and care they do receive, there has been increased effort to move research findings into policy, programs and practice. This lecture will demonstrate how an evidence-based platform (SCIRE) has been utilized to translate existing knowledge into best practice and inform relevant decision-making in public policy and practice settings. The need for an evidence-based SCI rehabilitation program has never been



greater given the enormous cost of SCI treatments and the long-term conseguences of this health condition. Although there are increasing amounts of rehabilitation research directed towards improving the lives of people with SCI, the translation of health research knowledge to practice has lagged substantially behind the creation of this new knowledge. Lack of translation to practice is not unique to SCI, but has been recognized in health care around the world. Reviews have generally found that patients receive only about half of the recommended processes involved in health care and have cited multiple examples where it took more than a decade (if not two decades) to move from research to actual uptake in clinical practice. Given the documented gap between what care people should receive and care they do receive, there has been increased effort to move research findings into policy, programs and practice. The Spinal Cord Injury Rehabilitation Evidence (SCIRE) is a synthesis of the research evidence underlying outcome measures and rehabilitation interventions to improve the health of people living with SCI. SCIRE (version 3) reviewed more than 1300 peer-reviewed journal articles and over 100 different outcome tools. SCIRE's dissemination consists of over 20 peer reviewed articles, 60 presentations and over 700 website hits per day. SCIRE is utilized as an evidencebased platform on which to inform numerous working groups in prioritysetting and strategic planning

initiatives. Specific initiatives which are utilizing SCIRE include an SCI casebased continuing medical education module, a clinical practice outcome measurement toolkit, a priority-setting exercise to identify targets for adoption into clinical practice and an open grant call for clinical implementation based on gaps identified from SCIRE. The feedback is that SCIRE has created a highly accessible source of quality information that facilitates best practice and is used by health care professionals, clients and their families, funding agencies, advocacy groups and policy-making groups.

#### Reference

Spinal Cord Injury Rehabilitation Evidence www.scireproject.com

#### Biography

See previous.

# Physical therapy and botulinum toxin-A (BTX) – the relationship between spasticity reduction and passive function improvement

#### **Mr Stephen Ashford**

Clinical Specialist and Research Physiotherapist, North West London Hospitals NHS Trust and King's College London

This presentation explores the temporal relationship between change in passive function measured by the Arm Activity measure (ArmA) and spasticity. In a cohort study of patients undergoing spasticity management with physical therapy interventions and botulinum toxin, change in both passive function and spasticity was considered across time. Spasticity was initially shown to decrease and then increase again by 16 weeks. Passive function improved by eight weeks and continued to be maintained at 16 weeks despite the increase in spasticity.

**Purpose** Establish the relationship between passive function and spasticity following BTX(Dysport) and physical therapy (PT) interventions.

**Relevance** Goals for spasticity management of the hemiparetic upper limb may be active function, if selective motor control is possible or passive function making it easier to care for the limb (eg hygiene) if motor return is not possible. BTX in the absence of PT would be expected to lead to reduction in spasticity and improvement in passive function by eight weeks followed by a reversion to pre-intervention levels. When applying BTX in combination with PT it is hypothesised that improvement in passive function will be maintained.

**Participants** A cohort sample undergoing spasticity management intervention (n=58).

**Methods** Measurement at baseline, eight and 16 weeks. Measures: the arm activity measure (ArmA), the modified Ashworth scale (MAS) and goal attainment scaling (GAS). Interventions consisted of BTX and splinting, serial casting, positioning, functional electrical stimulation and task practice.

**Analysis** To compare change the Friedman test was applied. Wilcoxon was then used to compare between time points.

**Results** Significant difference identified between baseline, eight and 16 weeks for passive function ArmA (Xr2 =11.9; p<0.005) and MAS (Xr2 =66.6; p<0.005)using Friedman test. No significant difference identified for ArmA active function sub-scale. Passive function significant difference between baseline and ArmA at 8weeks (Z=-2.1; p<0.05). Comparison of baseline to 16 weeks showed the difference from baseline was maintained (Z=-2.6; p<0.01), while MAS increased by 16 weeks.

**Conclusions** Spasticity increased at 16 weeks from an initial reduction at eight weeks, passive function is improved at 8 weeks and maintained at 16 weeks.

**Implications** Physical therapy interventions have a role to be explored further in maintaining functional improvements following spasticity management.

#### Biography

See previous.

# Deformity in children with cerebral palsy: how does it happen and what can we do?

**Mr Martin Gough** MCh FRCSI(Orth) Consultant Paediatric Orthopaedic Surgeon, Guy's and St Thomas NHS Foundation Trust

Musculoskeletal deformity in children with cerebral palsy may be progressive, may cause pain and may limit function. Prevention of deformity is generally focused on reducing muscle hypertonia and spasticity but deformity appears to represent a problem with muscle and subsequently bone growth which our current treatment model may not address. A reduced focus on the prevention of deformity may allow an increased focus on enhancing the function, communication and participation of the child with cerebral palsy. Although we define cerebral palsy as a nonprogressive neurological condition, musculoskeletal deformity in children may be progressive and may lead to loss of function, problems with daily care activities, and pain. Deformity is thought to be related to a failure of muscle growth due to spasticity or hypertonia, and these factors together with muscle deformity and overactivity are thought to adversely affect skeletal growth leading to problems such as hip dislocation. Nonoperative prevention or treatment of deformity generally involves stretching muscle, either actively for short periods or for longer periods by orthoses or other postural equipment, or reducing muscle activity by the use of botulinum toxin. These methods involve considerable investment of time by the children, their families and their therapists but lack supportive evidence and have not proved effective in preventing deformity. Deformity appears to be caused by altered or abnormal growth of muscle and bone but this appears to be related to the same mechanism which causes spasticity rather than by spasticity itself. Cerebral palsy is not strictly static as the original neurological insult results in altered development of the brain and spinal cord which in turn affects muscle development and subsequent growth: this is not addressed by our current

approach. It is important when considering any treatment intervention for deformity that we consider the child in the context of the family and establish a treatment goal which is relevant to the child at present and to their future comfort and independence as an adult. A shift in focus from preventing deformity to enhancing the quality of life of the child and at helping them to reach their potential for function, communication and participation may allow more effective use of the time and resources of the family and the multidisciplinary team.

#### Biography

Martin Gough is a paediatric orthopaedic surgeon with a special interest in children with disability due to neuromuscular problems. He trained in Ireland, and following fellowship experience in Toronto took up his present post working with the team in the One Small Step Gait Laboratory and the Evelina Children's Hospital in Guy's and St Thomas' NHS Foundation Trust, London in 1998. His research interests include the causes and outcome of treatment of deformity in children with cerebral palsy.

No abstract was available for the lecture **The basic mechanisms of direct current brain stimulation** presented by Dr Charlie Stagg.

## A delegates view

#### Penny Maddock

Advanced Physiotherapist, Neurosciences, Newcastle General Hospital

CSP Congress 2010 was my first experience of attending this event. So officially adorned with my delegate's badge, I wandered round the BT Conference Centre in Liverpool, found the seminar rooms then headed to the exhibition hall. The hall was covered by a multitude of trade stands exhibiting strapping tape to air deweighting treadmill training systems; in excess of fifty peer reviewed research posters; all the CIG, CSP/HCP stands and, oh yes, and a few friends I hadn't seen in ages next to the refreshments.

Congress format follows five main strands of lectures: Cardio-Respiratory; Leadership and Education; Musculo-Wwork and Well-Being; and Neurology. My 'Delegates Pack' contained the official programme of all the lectures taking place and clear information about the whole event including the delegates' drinks reception with a live Beatles tribute band!

By coming to Congress, I hoped to learn more about the most recent research and practice within the field of neurology primarily, but was inspired by the broad spectrum of topics in the other strands as well. I would have loved to divide myself in two on several occasions.

The Neurology Strand started with eminent Canadian Professor, Janice Eng delivering her current research on the benefits of exercise in the stroke population. I was interested in the idea of implementing early community stroke exercise classes as early as 2-4 weeks. Her second topic was about "Knowledge Translation (KT)": the process of integrating information derived from research directly into our clinical practice in a meaningful and timely manner. She named the SPIRE project as an example of KT through creating an open access website providing simulated spinal cord injury literature in one specialist place (www.spireproject.com).

Helen Tyler followed to explain her role in the development of the NICE guidelines for spinal cord metastases. She reiterated the need to provide specialist care and to maximise the potential for the patient to remain mobile, whenever possible.

Dr Ruth Parry highlighted the need for delicate, open communication and the significant benefits it can bring; I have already tried her "some" techniques clinically to great effect, almost too well (Geordies like to talk anyway!)

The Stroke Networks in Practice talk delivered by Adine Adonis raised awareness of overcoming barriers to develop inter-professional working for the benefit of the patient.

Key note speaker Alistair Campbell talked from a personal level when he gave the Founder's Lecture titled "Mental Illness – time to end the taboo". He not only described his experiences but provided insight into the prejudices he still feels having suffered a breakdown. He also warmly talked of his appreciation for the role physiotherapy played in his health recovery. On a more political note, he had generous praise for the work of the CSP and sought to reassure us that the profile of the CSP remains good. He strongly advocated the need for us all to continue our positive championing of the value and necessity of our service especially in this cost cutting economic environment.

Four 15 minute peer reviewed research presentations lead us through to the eagerly awaited debate: Is the Bobath approach relevant to neurophysiotherapy in 2010? This debate could have continued well into the night, Catherine Connall and Dr Fiona Jones were very professional throughout.

The second day allowed Dr Sarah Tyson to talk about outcome measures advocating using both ordinal and functional performance tests within our basket of measures. Dr Shelia Lennon explained the benefits of circuits training for people with MS and the positive results her ongoing research is revealing especially in respect of balance and falls. Several more topics were covered by the platform presentations with, again, to very high standard, before the CSP Annual General Meeting took the lunchtime slot. Following Professor Eng and rounding off the conference was Mr Martin Gough presenting on deformity in children with cerebral palsy.

Congress did meet my expectations and it is reassuring to see that there is a very active research body within the physiotherapist population. Will I be back next year, yes definitely, and I intended to take a stroll down Penny Lane, too, this time...

# **REVIEWS ARTICLES BOOKS COURSES EQUIPMENT**

Reviews of research articles, books, courses and equipment in *Synapse* are offered by regional ACPIN groups or individuals in response to requests from the ACPIN committee. In the spirit of an extension of the ERA (evaluating research articles) project they are offered as information for members and as an opportunity for some members to hone their reviewing skills. Editing is kept to a minimum and the reviews reflect the opinions of the authors only. We give the authors of the original book or paper the opportunity to respond. We hope these reviews will encourage members to read the original article and not simply take the views of the reviewers at face value.

#### EQUIPMENT

## The VIBROSPHERE

Review by Eva Leach BSc Physiotherapy, MCSP

The Vibrosphere is a physiotherapy tool giving neurophysiological training. It consists of a hemisphere with a platform resembling an ordinary wobble board. When plugged into a normal electric socket it can be activated via a hand set. The vibrations in this medically approved tool are gentle with an amplitude of up to 2mm and a chosen frequency between 20 – 45 Hz.

The control hand set has mainly two functions; frequency and time. The frequency can be set at a limit of 1 Hz and can be changed through the time set. The time can be set on 15,30,60 or 90 seconds. There is a delay button, seven seconds, and a program button used for repetitions of the same frequency and time.

The guidelines for choice of frequency is that the lower the frequency the more the demand on the muscles for strength building. The higher the frequency the more blood circulation and relaxation. The frequency has however to be tried out for each patient individually to get the maximum benefit and keeping the patient comfortable. The guidelines for time and the number of repetitions follow a similar pattern.

The Vibrosphere is small and light, 16 kgs, which makes it possible to bring the tool to the patient rather than the patient to the tool. The functional pad can be of three different thicknesses giving more or less stability depending on how grave the patient's impairment and the goal of the training. There is also a training mat made of blue hard



foam placed at the bottom keeping the Vibrosphere in place.

The Vibrosphere concept is a complement to other rehabilitation methods. The vibrations stimulate the muscle spindles and the alpha motor neurons which results in a tonic vibration reflex. When this reflex is combined with voluntary movement, even if very weak, an improved synchronisation of the the motor units occurs. Additionally, patients with poor proprioception will gain greater awareness due to the vibrations in combination with the variable instability of the Vibrosphere, the wobble effect. This effect increases the sensoric input from the skin, the musclespindles, the golgi organs, the vestibularis and the ocularis. The gain of a much improved postural control is especially beneficial for neurologically impaired patients suffering from MS,

Parkinson or stroke. There are very few contraindications making the training on the Vibrosphere suitable for most people.

A number of studies have been done on the continent, where the Vibrosphere is widely used. There are many positive results and more studies are pending. Some of the improvements include increased balance and postural control, endurance, strength and coordination. This is due to the fact that the Vibrosphere concept gives an intensive interaction between the CNS and the musculoskeletal system treating contractures, muscle weakness, spasticity, lack of motor control, decreased balance and decreased coordination.

The Vibrosphere is a unique and versatile physiotherapy tool bringing a scientific approach to significantly



#### **COURSES/CONFERENCES**

#### Balance problems in neurological conditions – visual, vestibular and proprioceptive influences

Merseyside ACPIN day course 12th March 2010 Mossley Hill Hospital, Liverpool Course Facilitator Nikki Adams

# Review by Jacqui Isaac, Heather Linnane and Merseyside ACPIN committee members

This study day was recommended by a fellow committee member who attended the course in Preston 2008.

The day was fully subscribed and attended by both ACPIN members and non members from the Merseyside and North Wales area. The course stimulated a great deal of interest and there was even a reserve list for places. A clear and detailed course manual was provided to all attendees.

Nikki Adams is a neuro-physiotherapist who recognised that many of her patients had a strong visual component to their balance problems. She underwent training from Mary Warren, an American OT, who had specialised in low vision neurology for 30 years and developed the Warren Brain Injury Assessment Battery.

The day began with an overview of the physiology of balance problems following brain injury and an introduction to Warren's Hierarchy of visual perception and how this relates to movement. The majority of the day was spent completing practical sessions.

Initially, assessment methods were introduced including the assessment of visual acuity, visual fields, oculomotor and righting responses. Later on, the practical sessions focused on sequential exercises to challenge gaze stability and then designing an exercise programme appropriately.

The day was aimed at providing therapists with ideas of how to assess

**Consultation and treatment rooms for hire** - South Croydon - Surrey. Main road location with parking close by. Free initial trial period. Clinic based in a lucrative and easily accessible part of South London/Surrey. Visit: www.etherapies.co.uk or email: lindsay.davis@btinternet.com and treat problems in this area with simple tools and practical ideas of how to put treatment programmes together. The course simplified and helped to relate clinically a number of visual tests we come across within daily practice and helped to highlight their link to balance function. There was an emphasis on our responsibility as physiotherapists to pick up on these problems and know when to refer to either ophthalmology or behavioural optometrists and what these professionals could provide.

The day received very positive feedback from course attendees and we are currently planning to run another date next year. We would like to take this opportunity to thank Nikki for her enthusiasm and the debate she stimulated on the day and look forward to working with her again.

#### The Lower Limb – what else do I need to know? Kent ACPIN study day 15th July 2010 Village Hotel, Maidstone

Course Leaders: Janice Champion, Nikki Guck, Paul Charlton, Cathy Kelly–Jones and James Sampson

Review by **Morag Taylor** Senior Physiotherapist, Stroke Services, Medway Community Healthcare

An interactive study day was held, which combined lectures and workshops, to explore both current and new interventions in the treatment of lower limb deficits and the evidence-base behind these approaches.

The day started with a revision of lower limb anatomy which was beneficial in setting the scene and reminding us of the important anatomical intricacies we sometimes forget. Janice Champion made this enjoyable and valuable by interspersing the anatomy revision sessions with a more in-depth look at the individual components of the gait cycle.

The morning was concluded with Paul Charlton, of Peacocks Medical Group, introducing orthotic principles and normal movement concepts. Paul's presentation was both engaging and challenging; he highlighted that orthoses are often not considered in stroke rehabilitation, yet they can enhance motor learning by ensuring correct alignment becomes the norm and, when used outside of therapy sessions, can enhance 'carry-over'.

The afternoon began with an interactive discussion about the use of the Wii Fit in clinical practice and the evidencebase, led by Nikki Guck. Attendees were encouraged to share current practice of the Wii in their own rehabilitation sessions and there was an interactive discussion about how patient improvement can be measured objectively. Following on from this, James Sampson led group discussions looking at a wide selection of outcome measures used within neurological rehabilitation.

The study day concluded with problem-solving workshops – each group viewed a patient video and was then encouraged to devise a treatment plan, utilising the techniques and principles discussed throughout the day.

This was a thought-provoking interactive study day, providing many ideas that could be utilised in everyday practice to further improve the quality of lower limb neurological rehabilitation.

# **REGIONAL REPORTS**

#### **East Anglia**

Nic Hills

#### Kent Nikki Guck

Our 2010 course programme has been very successful for East Anglia ACPIN so far. Our committee numbers have remained high with representatives from across the region. Unfortunately, Pippa de la Billiere

has stepped down from the chair role and we have yet to elect her replacement, we would like to thank her for her hard work for the past three years. East Anglia ACPIN membership numbers are well over 100 and it is great to see so much support for our courses.

Our 2010 programme has been very packed and the programme has involved a mix of evening lectures and study days which have all been well attended. Our most recent evening lecture was a two hour lecture entitled 'Searching for a dose of physical therapy to enhance motor recovery in stroke' by Professor Val Pomeroy at the University of East Anglia in September. To finish the programme we are running a vision perception hierarchy course in November. The programme this year has been great, thank you to all the hard work from the committee for making it so successful.

We have yet to finalise our 2011 programme, but please keep reviewing the website www.acpin.net for updates on the course programme. If you would like any information about any of our courses above please contact me.

As ever we would like to run courses that the members would like to attend, and we are always looking for ideas for future courses from the membership, so please contact me if you have any exciting ideas. We hope to see you at our courses next year. who more than readily give up their time for meetings and organisational duties, along with the lure of good food in a variety of pubs. Although there have been many changes since the March AGM within the structure of the committee, it remains a very friendly team with passion and drive. We, as a committee, would like to thank a variety of people, who without their help the committee may have ceased to exist, Jane Peters as she stands down as treasurer after seven plus years, and Janice Champion for all her efforts and support as she stands down as regional rep but remains on the committee. It is really nice to have a mixture of skilled clinicians from a wide area and from both public and private practice sitting on the committee.

Kent ACPIN continues to develop with

a strong committee of ten people,

the needs of many. Although the numbers of registered ACPIN members are relatively low in comparison to other regions, we still have the highest number of members for years and the plan is to continue developing this through education, networking and advertising locally.

This ensures that our education pro-

gramme for 2010 will hopefully meet

Our study day held in July 2010 'The lower limb, new innovations and the impacts on clinical practice' was very well received. It was designed (and succeeded) to facilitate an open discussion between clinicians on the research and the tools available to treat the lower limb. The lectures were provided by local clinical specialists James Sampson, Janice Champion and myself and the fabulous external speaker was Paul Charlton, Senior Orthotist Peacocks, who never fails to provide a brilliant couple of hours. Our grateful thanks must also go to Beagle Orthopaedics, E-Link and Allergan who kindly sponsored the day and were available all day to interact and answer any questions.

In September, we held an afternoon/evening lecture with Adine Adonis providing an exciting lecture on HTLV – Human T-cell lymphotrophic virus, and the affect of immunology on long term neurological conditions. Although, the numbers of clients seen in Kent with this specific condition are exceedingly low, the discussions generated were stimulating and thought provoking.

As a committee we are in the process of planning the Winter/Spring 2010/11 events, which hopefully will include a balance study day using the Vibrospheres in November or December.

Any ideas from our members about their wishes and needs would be gratefully received regarding support and education. It would be very interesting to know if our members are happy with the current format of predominantly study days and the occasional evening lecture, or if they would be interested with a different format.

#### London

Andrea Stennett

The year 2010 has been an exciting one for the London Region. We decided as a committee to modify the delivery of our lectures. We enhanced our usual variety of study morning (multiple sclerosis and spinal cord injury) lectures with 'the view from the patients' perspective'. Judging from the positive feedback we concluded that this was a welcomed change. Also, for the first time we had our full day event on balance rehabilitation with Professor Anne Shumway-Cook. The evening lectures continued as per usual and as a treat to you our members we had our wine and cheese event in September; one of our highlights of the year.

The London committee would like to take this opportunity to say a big thank you for your continued support. We would also like to express our sincere gratitude to all our speakers for 2010.

Our membership continues to grow year on year. As a committee we recognise the current challenging economy and as such we continue to provide courses for our members at a much subsidised rate. I am sure that vour fellow colleagues are jealous of the difference in member versus non-member fees for our courses. If they are, encourage them to be a part of ACPIN. Also, members are invited and encouraged to utilise the London ACPIN International Lecture fund that was set up for you. Details on how to apply are on the ACPIN website under the London region.

We continue to look forward to 2011 and already we have the course outline which we will be sending out very shortly! Just to give a little taster of what is to come: In February, we will have a combo study morning with an update on 'Self-efficacy (Bridges) and vocational rehabilitation': 'Evidence based neurophysiology' in April; cohosting with ACPIVR on vestibular rehabilitation in September and in November back by popular demand we will host a research study morning giving our fellow colleagues an opportunity to showcase their current research. Our annual wine and cheese event will be in the summer of 2011. As soon as dates are finalised we will let you know. Keep checking Frontline, iCSP and ACPIN's website www.acpin.net under the London region for future updates.

On behalf of London ACPIN, I would like to wish you all the best for the rest of the year 2010 and looking forward to working with you in 2011.

As usual if you have any suggestions, ideas on courses or any other queries please feel free to contact us at londonacpin@googlemail.com

#### Manchester

Stuart McDarby

Hello to all our members and potential members! 2009/2010 has seen a number of changes to our committee personnel and members taking up new roles. Most notably Julie Rigby, our chair, stepped aside to continue work on her Phd and has been replaced by Claire Robinson. We would like to thank Julie for her leadership and all round contribution to Manchester ACPIN in recent years and wish her all the best for the future.

The committee now consists of Claire Robinson (chair), Anna Ziemer (secretary), Helen Dawson (treasurer), Lorraine Azam and Stuart McDarby (regional rep). As always, we would welcome any interest in members joining, so feel free to get in touch!

In terms of our programme, the lectures in 2010 have been well received. January saw a discussion on orthotics at the Royal Bolton Hospital from Steve Shields; March was our AGM and included a patient demonstration session from Lynne Fletcher at Manchester Neurotherapy centre: Tim Walton (clinical specialist) gave a talk on Guillain Barre syndrome in May at the Trafford MS centre; July's lecture took place at the Highbank Rehabilitation Unit in Bury and the topic was 'Management of the neurological shoulder', incorporating MSK techniques into the neurological spectrum!

As mentioned previously, the lectures have been well supported by our members and the committee would like to express their gratitude for the efforts of the external speakers.

As previously, emails will be sent out prior to these lectures to give further details and we are putting together an exciting and thoughtprovoking programme for 2011!

Provisional topics include: March: AGM and patient demonstration by Bobath tutor, a planned half-day workshop on 'treatment of the unstable shoulder'; an update on the neurosciences network in July; a lecture around balance/ ataxia in September and a discussion on 'Urology in Neurology' in November.

As always, we are grateful for any feedback and ideas from our members, so please get in touch!

#### Merseyside Laura Phillips

We have had a few changes to the committee since our last update. Jo Jones and Stella Dynes have both resigned due to other commitments and we would like to thank them for their contributions. On the plus side we have welcomed Anita Wade-Moulton as a much valued new committee member. The committee currently has seven members.

As usual I would like to make an appeal to any Merseyside ACPIN members who would like to become committee members, we would love to have your input. Please contact us through our email address (merseysideacpin@yahoo.co.uk).

I am pleased to report another successful run of study days and evening lectures that have all been well attended and have received positive feedback. They have included evening lectures on heterotopic ossification, post polio management and bladder and bowel dysfunction in neurological patients. As well as this we have had a vision and balance course, an upper limb course led by Bobath tutor Clare Fraser and a patient demo study day with Sharon Williams.

Our membership currently stands at 42 and we would like to thank all the members for their continued support. We really do appreciate your feedback so if you have any feedback or ideas for future courses or lectures please contact us via the email address.

We are planning to send out the 2011 course programme to all members in December.

**Northern** *Catherine Birkett* 

Hello to all Northern ACPIN members. Since our last update, we have successfully hosted two further events an orthotics in neurology study afternoon in April and a Goal Attainment Scale journal club and discussion in June. Both were well attended with good feedback so thank you to all who attended and for those involved in their organisation. We plan to run more of the journal club and discussion type events in the future, with one planned for September on the HiMAT and Functional Reach Outcome Measures over in Carlisle. This will be the first event we have run in the West of our area for a while and we are looking forward seeing how this is received and hope it will be a good start to more events in that part of our huge geographical region! We are now producing a newsletter for our members with our programme for the year ahead future events include a one day postural control course, APPI level 2 course, a splinting workshop and a functional disorders study day. Members can contact us at any time for more information or suggestions on our email address: northern acpin@hotmail.co.uk

## Northern Ireland

Joanne McCumiskey

Hello to all our NI ACPIN members. Firstly, a big thank you for supporting our programme of events over the last few months. In April, we ran a very successful course entitled 'The role of manual therapy in the management of peripheral joint problems'. This was well received by our membership and NI ACPIN were able to collate some funding from the course. This will be placed directly back into the membership pocket, through a ballot for a ticket to the ACPIN National Conference in March 2011. Every attendance at our lecture programme from September to January will be rewarded with a ballot ticket, with the draw being made at the January lecture, so come along!

The new programme kicked off with a bang in September, with a

lecture on CIMT by one of our local PhD students. This was followed by an excellent workshop on management of the complex neurological patient, by our fantastically supportive team in the Regional Acquired Brain Injury Unit. With evenings on vestibular rehabilitation and early supported discharge coming up, those dark evenings of winter are looking much brighter!

The committee are looking forward to seeing you all over the next few months and, as always, wish to thank you all for your continuing support of the hard work that we are putting into your programme of events. See you all soon!

#### Oxford

Clare Guy

As we head into Autumn and Winter we can look back at an active term. Once again Stana Bojanic spoke to a packed audience with her neuroscience knowledge. Jane Moser was also well received and we should not ever get 'stuck on the hard shoulder again'! Our evening lectures remain the mainstay for Oxford ACPIN with regular attendance over 20 and although the venue tends to be Oxford, lectures at Stoke Mandeville and Wycombe attract a good attendance, often seeing new faces.

We had a talks on apraxia and speech and language therapy and on 1st December Giles Yates, a clinical psychologist will be talking on 'The Influence of emotional factors on neurological rehabilitation of gait and mobility following TBI'. We are planning some day and half day courses between the evening ones , one of which, a combined course with Richard Sealy looking at gait and neurophysiology. Please look out for details on fliers, *Frontline*, and the Oxford section in the national ACPIN website or call any of the committee.

Again thank you to all our members for your support, Oxford ACPIN is for you; please feel able to suggest topics and thank you for entering into healthy debate. We have welcomed some new members to the committee as current members complete MSc's and are kept busy with growing families.

#### Scotland

Dorothy Bowman

ACPIN Scotland membership has stayed stable over the year with approx 90 members.

Courses were organised eg 'The neurobiomechanical approach to management of gait problems in neurological adults' which was well attended with good feedback. Unfortunately the kinetic control course had to be cancelled in June as there were not enough applicants to run it. Apologies to all those that noted an interest.

We try to vary topics and venues but we always welcome ideas for courses and offers of venues. We are aware of budget cuts and the restraints on course funding but we do try and keep the prices on courses down and offer good value for money.

We would really appreciate if any one works at or has access to a good venue and would consider hosting a course or has any ideas for speakers.

At the end of the year there will be several posts that will need to be filled, to keep the Scotland ACPIN committee functioning, if you could consider becoming a committee member or would like more information please get in touch. The posts of Scottish Rep, chairperson and three committee members all need to be filled.

The committee would like to thank Jacalyn Wallace who stepped down from the committee in the summer, for all her support and commitment to ACPIN over the last few years.

#### Programme for 2011

- February *Functional/Conversion Disorders* Venue tbc AGM will be held in the lunch break.
- June Exercise in Neurological Conditions – Study day looking at current research and how to implement into practice, will aim to cover MS, Stroke and PD Venue tbc.

#### South Trent Cilla Williams

The summer of 2010 has been a relatively quiet one for South Trent. Unfortunately we had to cancel the myofascial release course by Peter Mitchell in September, due to lack of interest. We hope we can run something similar in the future.

On a more positive note, we now have a stronger committee, having gained more representatives from across the region. This means we have the potential to organise more regular events. We would like to say a special thank you to Laura Grant who has taken on the role of treasurer.

For 2011, our events include an evening lecture on FES by Alison Clarke. This will be held in March in Derby. We also have a Bobath workshop with Clare Fraser planned for 18th-19th June. Further ideas for lectures include the use of ultrasound for biofeedback. And for 2012, we have an Advanced Themed workshop booked with Mary Lynch-Ellerington. More details of all these events will be given nearer the time. We will strive to keep the South Trent section of the ACPIN website up to date which is something we haven't been good at recently!

As ever, we are keen to meet the needs of our regional members so email me (priscilla.williams@ nhs.net) with any event ideas and feedback. Or come along to one of our informal meetings if you would be interested in joining the South Trent committee. Thanks again for your continued support and we look forward to seeing you in 2011.

#### **South West**

Helen Madden

South West ACPIN continues to try and organise a varied programme of courses. We held a successful AGM in April on gait, an evening lecture on the treatment of unexplained symptoms and our summer social with an interactive neuroanatomy session which were all oversubscribed. Thank you as ever for your continued support with the courses we have organised.

Our programme for the end of 2010

Are you an ACPIN member? And a senior practitioner? ...in a clinical, managerial or research role And contactable by email?

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Invitation

We occasionally need to gather opinions, comments and informed perspective at a local, regional or national level to help guide ACPIN's position on topical issues and we would like your help to do this.

´What's in \_it for me?



Yes!

- Contribute opinions which will shape neurological physio practice
- Links with your KSF evidence

Why?

• Be the first to know what is going on in neuro-rehab; clinically, politically and managerially

# Please contact your regional representative for more information

Regional representative details on www.acpin.net

...because the more the merrier! and early 2011 is still being finalised. Further information about courses will be placed on the ACPIN website, interactive CSP and via email to our members once confirmed, but we hope to be running courses on ataxia, shoulders, hands, seating/ postural management, neurology and exercise and interpersonal communication skills.

As ever we would welcome new committee members, especially if you are based in the South Wales or Devon/Cornwall area, as this would help with ensuring the courses cover the whole South West region.

Please get in touch with us if you wish to find out more information about being on the committee or ideas/suggestions for future courses Helen.Madden@banes-pct.nhs.uk

#### Surrey and Borders Kate Busby

Over the past few months we have enjoyed a couple of evening lectures. In April, Sara Demain talked re: 'Discharge from stroke physiotherapy'. All attendees enjoyed having the opportunity to have their say within the open forum created. This was followed in June by an awe inspiring talk by David Constantine on 'Seating in the developing world'. Our study day, 'A rough guide to neuro-oncology for physiotherapists' in October proved popular nationally and was very well received.

#### **Programme for 2011**

- 22nd February Mental imagery in rehabilitation Thamar Bovend'Eerdt
- May/June Day course in neurological rehabilitation – tbc
- September 24th Gym ball course-Janice Champion

All events will continue to be advertised on iCSP, *Frontline* and on www.acpn.net

If you have any queries or suggestions regarding ACPIN issues or our forthcoming programme, please contact me on: ksmoff@hotmail.com

### Wessex

Hayden Kirk

2010 has been another busy year for Wessex ACPIN, membership has risen to a very healthy eighty two with twelve of the members volunteering for committee roles.

Evening lectures and course attendance during 2010 has been good and we would like to thank Dr Geert Verheyden and Nicola Howard for giving their time to talk on tDC and commissioning. Our two major events for the year were a thermosplastic splinting course and MS study day. These courses take a great deal of organisation and we are grateful to Kelly Saunders and Mary Vincent for all their hard work in not only producing the excellent events but also in raising vital funds for Wessex ACPIN.

So how can we build on this success for 2011? With the results of the on-line survey and some committee brainstorming we are compiling a list of talks and events which will hopefully be informative and fun. As always we would really welcome any further suggestions from members as well as hearing from anyone who would like to gain some experience sitting on the regional committee (any members welcome – experience is not a barrier!)

As this goes to print local ACPIN member Emily Rogers will be undertaking a two month placement in Ghana as part of the Wessex Ghana Stroke Partnership. A small portion of her funding for this came from Wessex ACPIN and we wish her well and look forward to hearing her presentation about the visit next year.

And finally, please continue to access the Wessex regional page of the ACPIN website to see what events are up coming and to apply for our regional bursary to help fund any CPD courses that you wish to undertake.

## West Midlands

Katherine Harrison

As the nights get shorter West Midlands ACPIN can reflect back on 2010 successes. The committee remains strong with nine members meeting regularly to organise events and discuss and develop neurological physiotherapy in the West Midlands.

Back in March we held an evening lecture on intrathecal baclofen therapy by Dr Pana Consultant in Rehabilitation. This very interesting topic was well attended. This was followed by a day course on neuroplasticity by Jackie Shanley, lecturer at Coventry University. This course was aimed for Band 6 and higher and Jackie delivered this complex topic in her usual enthusiastic way, making it understandable and enjoyable!

Most recently we ran a small but highly practical course on reach and grasp retraining by Paulette Van Villet. This course received excellent feedback with participants finding the practical work very useful for the clinical setting. On the success of this Paulette is doing a more theoretical study day on the 8th of January 2011 titled 'Putting feedback and action into practice'. As for the rest of 2010 at the time of writing we are holding an evening lecture on facial assessments with speaker Sally Glover on the 21/10/2010 and hopefully an evening lecture on a patient's perspective of spinal cord injury nearer the end of the year. We are also keen to do something on CIMT in 2011, so watch this space!

For more information on upcoming events please look at the West Midlands section of the ACPIN website. We welcome any suggestions of topics or venues for events you would like West Midlands ACPIN to organise.

Thank you for your continued support this year.

Please check ACPIN website for contact information as at the time of writing this is due to change.

# Yorkshire

Kirstie McLaren

This past six months has seen a number of changes in the committee. We have sadly said goodbye to Jill Fisher who has represented us for many years and been an inspiration in many ways. A hard act to follow but I shall do my best.

Our thanks also go to Liz Hall (Walker) who has retired as our treasurer and Sarah Kelman is now following her lead and dragging us in the 21st century but is currently on maternity leave and we wish her well.

We have welcomed Suzanne Froggett to the committee but are verv keen to welcome new members. As a committee we are aware that the courses that we run are often in the West Yorkshire area in particular Leeds and Bradford. This is because the committee members work within this area and are therefore familiar with facilities available. We have tried to consider other venues for upcoming courses for 2010/11 including York and Hull/Beverley. We are keen to try new venues and would appreciate any suggestions. It is always helpful to have a link person available at the venue to help coordinate on the day. If you would be willing to assist Yorkshire ACPIN for a future course at a different venue, then please contact us via email.

We have an exciting future events lists comprising of evening lectures and day courses to suit a wide variety of people. Details can be found on iCSP or the ACPIN website or contact us on our email to be added to the mailing list.

# WRITING FOR SYNAPSE

Synapse is the official peer-reviewed journal of the Association of Chartered Physiotherapists in Neurology (ACPIN). Synapse aims to provide a forum for publications that are interesting, informative and encourage debate in neurological physiotherapy and associated areas.

Synapse is pleased to accept submitted manuscripts from all grades and experience of staff including students. We particularly wish to encourage 'novice' writers considering publication for the first time and ACPIN provides support and guidance as required. All submissions will be acknowledged within two working weeks of receipt.

Examples of articles for submission:

#### **Case Reports**

Synapse is pleased to accept case reports that provide information on interesting or unusual patients which may encourage other practitioners to reflect on their own practice and clinical reasoning. It is recognised that case studies are usually written up retrospectively. The maximum length is 3,000 words and the following structure is suggested:

**Title** – this should be concise and reflect the key content of the case report.

Introduction – this sets the scene giving background to the topic, and why you consider this case to be important, for example what is new or different about it? A brief overview of the literature or the incorporation of a few references is useful so people can situate the case study against what already is known.

The patient – give a concise description of the patient and condition that shows the key physiotherapeutic, biomedical and psychosocial features. Give the patient a name, but not their own name. Photographs of the patient will need to be accompanied by explicit permission for them to be used. Only relevant information to the patients' problem should be included.

Intervention/method – Describe what you did, how the patient progressed and the outcome. Aims, treatment, outcomes, clinical reasoning and the patient's level of satisfaction should be addressed. Indications of time scales need to be considered.

Implications for practice – Discuss the knowledge gained, linking back to the aims/purpose, and to published research findings. Consider insights for treatment of similar patients, and potential for application to other conditions.

Summary – List the main lessons to be drawn from this example. Limitations should be clearly stated, and suggestions made for clinical practice.

**References** – the Harvard style of referencing should be followed (please see *Preparation of editorial material* below).

#### **Original research papers**

These should not exceed 4,000 words and papers should include the following headings:

Abstract – (maximum of 300 words)

#### Introduction

Method – to include design, participants, materials and procedure

#### Results Discussion

**Conclusion** – including implications for practice

#### References

#### Abstracts of thesis and dissertations

Abstracts from research (undergraduate and postgraduate) projects, presentations or posters will be welcomed. They should be up to 500 words, and broadly follow the conventional format: introduction, purpose, method, result, discussion, conclusion.

#### Audit report

A report which contains examination of the method, results, analysis, conclusions of audit relating to neurology and physiotherapy, using any method or design. This could include a Service Development Quality Assurance report of changes in service delivery aimed at improving quality. These should be up to 2,000 words.

#### Sharing good practice

This Synapse feature aims to spread the word amongst ACPIN members about innovative practice or service developments. The original format for this piece started as a question and answer session, covering the salient points of the topic, along with a contact name of the author for readers to pursue if they wish. Questions were loosely framed around the following aspects (this would be for an audit)

- What was the driving force to initiate it?
- How did you go about it?
- What measurements did you use?
- What resources did you need?
- What did you learn about the process?How has it changed your service?

However recent editions have moved away from this format, and provide a fuller picture of their topic eg *Introducing a* management pack for stroke patients in nursing homes (Dearlove H Autumn 2007), An in-service development education programme working across three different hospitals (Fisher J Spring 2006), A therapy led bed service at a community hospital (Ramaswamy B Autumn 2008) and Establishing an early supported discharge team for stroke (Dunkerley A Spring 2008).

#### Product news

A short appraisal of up to 500 words, used to bring new or redesigned equipment to the notice of readers. This may include a description of a mechanical or technical device used in assessment, treatment management or education to include specifications and summary evaluation. Please note, ACPIN and *Synapse* take no responsibility for these products, it is not an endorsement of the product.

#### Reviews

Course, book or journal reviews relevant to neurophysiotherapy are always welcome. Word count should be around 500. This section should reflect the wealth of events and lectures held by the ACPIN Regions every year.

#### OTHER REGULAR FEATURES Focus on...

This is a *flexible space* in *Synapse* that features a range of topics and serves to offer different perspectives on subjects. Examples have been a stroke survivor's own account, an insight into physiotherapy behind the Paralympics and the topics of research, evidence and clinical measurement.

#### Five minutes with...

This is the newest feature for Synapse, where an ACPIN member takes 'five minutes' to interview well-known professionals about their views and influences on topics of interest to neurophysiotherapists. We are always keen to receive suggestions of individuals who would be suitable to feature.

#### PREPARATION OF EDITORIAL MATERIAL

Copies should be produced in Microsoft Word. Wherever possible diagrams and tables should be produced in electronic form, eg excel, and the software used clearly identified.

The first page should include:

- The title of the article
- The name of the author(s)
- A complete name and address for
- correspondence
- Professional and academic qualifications for all authors and their current positions

For original research papers, a brief note about each author that indicates their contribution and a summary of any funds supporting their work.

All articles should be well organised and written in simple, clear, correct English. The positions of tables and charts or photographs should be appropriately titled and numbered consecutively in the text.

All **photographs or line drawings** should be *at least* 1,400 x 2,000 pixels at 72dpi.

All **abbreviations** must be explained.

**References** should be listed alphabetically, in the Harvard style. (see www.shef.ac.uk/ library/libdocs/hsl-dvc1.pdf) eg:

Pearson MJT et al (2009) Validity and interrater reliability of the Lindop Parkinson's *Disease Mobility Assessment: a preliminary study* Physiotherapy (95) pp126–133.

If the article mentions an **outcome measure**, appropriate information about it should be included, describing measuring properties and where it may be obtained.

#### Permissions and ethical certification;

either provide written permission from patients, parents or guardians to publish photographs of recognisable individuals, or obscure facial features. For reports of research involving people, written confirmation of informed consent is required.

#### SUBMISSION OF ARTICLES

An electronic and hard copy of each article should be sent with a covering letter from the principal author stating the type of article being submitted, releasing copyright, confirming that appropriate permissions have been obtained, or stating what reprinting permissions are needed. For further information please contact the *Synapse* coordinator: louisedunthorne@tiscali.co.uk

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