# Synapse

- Is Constraint Induced Movement Therapy (CIMT) a feasible treatment option in an inpatient rehabilitation environment within the NHS?
- Use of Botulinum toxin in the treatment of elbow flexor spasticity in acute stroke
- Pusher Syndrome: a relevant issue in stroke rehabilitation





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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

# Welcome to the Spring/Summer 2012 edition of *Synapse*!

As usual sitting down to write *From the Chair* makes me reflect on the hard work of the exec and think of our plans for the year ahead!

The last Chair's address I had written was full of despondency at the thought of the health and social care bill being passed and the implications that would have for physiotherapists, however although it was passed last week I am feeling much more optimistic!

I have just returned from the 2012 residential conference in Northampton, *The backbone of neurology*, which was a complete sell-out and unfortunately we even had to turn people away. The buzz and enthusiasm at the conference was amazing. Judging by the silence and complete attention in the lectures, the chatter at breaks and the dancing 'til the wee small hours everyone had a great time and the feedback from the delegates has been fantastic. We even got a mention in *The Times* by Melanie Reid, whose full presentation can be listened to on the website. For those of you who were unable to attend we also have a short video to give you an overview of the day and the speakers' presentations are also available on the website.

We have also adopted our new constitution and are fully affiliated with the CSP as a professional network within the neurological alliance.

An account of all our links with other organisations is more fully described in the conference abstracts and on the website and thanks to Jo Tuckey, Cherry Kilbride, Bhanu Ramaswarmy and Dr Fiona Jones for their involvement on behalf of ACPIN.

I can hardly believe that my two years as Chair has passed and it is time to step down. Thank you for allowing me to have the honour of being chair of such a dynamic and enthusiastic group of professionals, I have enjoyed every minute and made lovely friends along the way!

Signing off!

Siobhan MacAuley

Thank you to Siobhan for being such a fantastic Chair. She has shown so much dedication and enthusiasm throughout her term and she will be very much missed.

ACPIN Committee

# **Participate or perish**

Margaret Mayston AM FCSP PhD ACPIN President

These may sound like strong words, but in these uncertain times we all need to be prepared to make an active contribution to the ongoing discussions and processes, whether they be about the economy, the NHS or, the future of physiotherapy.

In particular, participation is needed in the discussions about the role of ACPIN and where it fits into the new Professional Network structure (CSP) and its interaction with the wider world of neurology. We know from the International Classification of Functioning Disability and Health (ICF), that a focus on participation is key to successful rehabilitation and habilitation. It is also essential for the future of our profession.

As I am embark on my fourth and final year as President of ACPIN I have cause to reflect on where the physiotherapy profession is at, the healthcare structure and physiotherapy education. We learnt in March of the long awaited decision of the NHS London review of physiotherapy education, which is supported in the capital financially by the NHS. A decision has been made to support only three of the central London schools: Kings, Brunel and St Georges, and of course places have been cut significantly nationwide. How has this come about? - was the expansion of education the result of poor consultation, or has this come about because of the financial crisis in which the world finds itself? I suspect both factors. The NHS reform discussions and implementations will continue, and the only outcome from these will be further reduction in budgets, less service provision, overworked healthcare professionals and

fewer jobs available for qualified physiotherapists (already a significant concern especially for new graduates). The knock-on effect is less money available for CPD and possibly a reduction in skill development. Will our speciality of neurophysiotherapy perish? I am confident we will continue despite these cuts and changes, but it requires our active participation – all of us.

At times, more so in these recent times of global recession and blind insistence on evidence based practice or nothing, I do feel despondent about the vision of physiotherapy and what might happen to the profession, and rather pleased that I can retire soon! But, when I look at this specific interest group there is cause to feel confident for the future and to continue. ACPIN goes from strength to strength, has well over 2,000 members and all events are well attended. This is in large part thanks to the dedicated work of the executive who give their time freely and enthusiastically, and to the membership in general who want to develop their skills and be the best therapist that they can for the clients they treat, and also to have pride and confidence in the work that we do.

One of the many privileges in being President is that I have had the opportunity to work with three Chairs over my term, and to work with a large number of committee members and regional representatives. I have to say that they make a formidable team. However, I need and want to make one plea on their behalf. The Chair, formerly Siobhan and now, Gita, needs to have prompt replies to their queries from the committee members and

regional representatives about the ACPIN response to a whole range of matters: media releases, the Stroke Forum, possible conference speakers, through to who will assemble the conference packs late at night, or make sure that all the sandwich wrappers and disposable coffee cups are in the rubbish bin when the meeting is over. The Chair did not take on the job to be an autocrat and values and needs your responses, and requires them in good time without needing to send reminders. Please respond in a timely fashion. For the wider membership, please make your contribution by joining the executive, becoming a regional representative, contributing to *Syn'apse*, participating in surveys when requested, and of course attending meetings whether they be local, national, or in support of ACPIN at the national CSP conference.

That's my grumble finished. Over 2,000 members can make a highly significant contribution to the development and progression of neurophysiotherapy. Be a part of it!

This was the President's address at the 2012 National ACPIN conference and AGM.

# Constraint Induced Movement Therapy (CIMT)

– a feasible treatment option in an inpatient rehabilitation environment within the NHS?

Rebecca Bradshaw Bsc (Hons) MCSP

Following a stroke, many different factors make the use of an affected upper limb difficult. One such factor which may be overlooked as pure motor weakness is learned non-use. This phenomenon commences with the inability to use the affected upper limb in the acute phase after stroke, when the ischaemic penumbra is maximal. The resultant feeling of failure and the ability to manage with use of the unaffected limb reinforces the compensatory use of the unaffected side. This can result in the person with hemiplegia no longer trying to use the affected upper limb, even once the penumbra has resolved and activity is returning (Taub *et al* 1999).

One treatment technique which seeks to address learned non-use is constraint induced movement therapy (CIMT). Traditional CIMT involves mitt wear, by way of constraint, on the unaffected upper limb for 90% of waking hours and six hours a day of task practice and shaping exercises for two weeks. Suitable patients are required to have active finger and wrist extension and have sufficient cognition to take on board the demands of the programme (Wolf 2006, 2008). CIMT was first developed in America by Dr Edward Taub and has been tested by more than 120 studies in various versions from traditional to modified forms, (Taub et al 2006) including the rigorous, randomised, controlled, multicentre EXCITE trial which involved 220 participants over a two year follow up period (Wolf et al 2006, 2008).

CIMT is one of the most evidence based forms of upper limb rehabilitation available for stroke patients, and yet, anecdotally, it appears to be minimally utilised as part of routine clinical practice by physiotherapists within the NHS. The reason for this is unclear and is the subject of current investigation amongst ACPIN members who await the

publication of survey findings. The main issues appear to be staffing levels, lack of consensus of how to carry out CIMT and strict inclusion criteria. In the National Clinical Guidelines for Stroke (RCP 2008) the importance of patient commitment to a CIMT programme is reinforced because of the 'considerable health resource' required to provide this intervention. As an NHS clinician this recommendation highlights one of the major barriers to CIMT - not enough time. NHS occupational therapist (OT) and physiotherapist (PT) to patient ratios are recommended as one to five (BSRM 2009, BASP 2010) and actual average figures fall below these guidelines (RCP 2007, Rudd et al 2009). The provision of six hours of supervised exercise daily seems overwhelming and impossible in services which are struggling to see their patients for 45 minutes, five days a week per discipline, in order to meet published guidelines (NICE 2010).

In addition to the time factor, is the issue of a lack of standardisation of the approach (Tuke 2008). Despite the publication of articles that have attempted to characterise the intervention pro-tocol (Morris 2006), specifically what sort of exercises to carry out, has remained unclear. Some clarity has been provided by the EXPLICIT study (Kwakkel *et al* 2008) which supplied a detailed and repeatable protocol including photographs of specific exercises used within CIMT, for their five year research programme, the results of which have not yet been published.

Finally, strict inclusion criteria apply in many of the studies, particularly around mobility levels. Current guidelines for stroke (RCP 2008) state that CIMT should be offered to appropriate patients who are independently mobile. In an inpatient environment patients are rarely mobile at admission and, in the author's experience, are often primarily concerned with their mobility levels over their reduced upper limb function and prefer to set their goals around walking in order to facilitate discharge. A recent study by Hartigan *et al* (2010) showed that the majority of stroke patients with both upper and lower limb affected identified either mobility or active tasks such as gardening as their main goals.

This article, therefore, seeks to give an account of a real life, NHS inpatient unit's efforts, to incorporate this highly evidenced intervention into a rehabilitation programme, in order to encourage other practitioners to trial CIMT within their client groups.

### **DRIVING FORCE**

In our regional neurorehabilitation unit, CIMT had not been used as described in the literature, except as a highly modified version trialled within treatment sessions and occasionally a modified version of forced use involving only the constraint element during specific functional tasks. For example a patient eats two meals a day while their unaffected upper limb is constrained. However, as a small unit (eight neurorehabilitation beds) with a full complement of multi-disciplinary team members, including assistant staff, we considered ourselves well placed, to be implementing one of the most evidence based forms of upper limb rehabilitation.

The physiotherapy team chose to present CIMT to our area's professional group quarterly meeting in April 2010 and we therefore researched the subject in depth, drawing together multiple articles including several randomised controlled trials (RCTs) examining the efficacy of CIMT. Studies not only showed immediate effects after only a two week intervention, but effects that were lasting up to two years later (Wolf 2008). We felt that, as a unit, we should be able to offer CIMT as a treatment option to appropriate patients in order to ensure that our practice is both up to date, evidence based, and in line with national guidelines for stroke.

### WHAT INFLUENCED OUR CHANGE IN PRACTICE?

The EXCITE trial was one of the most recent and powerful of the CIMT studies available (Wolf *et al* 2006, 2008), and its two week, intensive programme fitted in well within our unit which admits patients for an average of three months. We therefore decided to base our intervention on their protocol with the clearly laid out exercises from the EXPLICIT trial (Kwakkel *et al* 2008) as a photographic resource to ensure that the intervention would be clear and easy to follow by any member of our multidisciplinary team (MDT).

In January 2011 several members of the MDT attended the first course in the country entitled 'How to do CIMT?' (Harrison Training 2010). The trainers presented a case study of CIMT in the community and gave many examples of the types of exercises and activities involved as well as providing examples of how to set up a CIMT programme with the types of paperwork required. We adapted this paperwork to make it suitable for our unit.

### **CASE REPORT**

Our first opportunity to use CIMT came with a 47 year old patient admitted to our unit five weeks after a left middle cerebral artery infarct which was thrombolysed. We introduced the idea of the two week intensive programme from an early stage in order to prepare the patient. We agreed with the patient to complete the programme in the final two weeks of his nine week admission once his mobility had improved (at admission he was mobile with assistance of two and a stick, by the time of his CIMT programme he was independent unaided). A behavioural contract was drawn up in which certain tasks were excluded from mitt wear ie stairs, drinking/pouring hot drinks and showering (because the mitt wasn't waterproof) and certain tasks were highlighted as possibly requiring extra help eg dressing. Both the patient and his wife signed witnessed written agreements to formalise the process and ensure he understood the commitment required of him, having been provided with written information on the programme a few days before. His two week programme consisted of:

- Mitt wear for 90% of waking hours.
- Three hours of supervised intervention by the therapy team every weekday.
- One hour intervention supervised by his wife every weekday.
- Two hours independent shaping and task practise every weekday.
- Each hour long session consisted of four tasks a mixture of strength, range of movement and dexterity tasks, each completed for 15 minutes.
- The programme started on a Wednesday in order to provide an early break (mitt wear only at weekends) after the first three days. See *Appendix 1* for examples of exercises used.

### WHAT MEASUREMENTS DID WE USE?

Having reviewed upper limb outcome measures used in the CIMT research papers, we felt that the most evidence based and clinically relevant for us and for our patient were the *Nine hole peg test* (NHPT) (Kellor *et al* 1971, Heller *et al* 1987, Mathiowetz 1985) and the *Jebsen test of hand function* (Jebsen *et al* 1969, Bovend'Eerdt *et al* 2001) for dexterity, and dynamometry for power (Heller *et al* 1987, Sunderland *et al* 1989). The *Canadian occupational performance measure* (COPM) (Bodiam 1999, Cup *et al* 2003) was used to measure the patient's perception of his upper limb use, including identification of key functional tasks and self-rating of their current performance level and degree of satisfaction with their current performance. Each component is scored out of ten with ten being the most satisfied. The measures were completed twice in the two week programme, the day prior to commencing the programme and the day after completion. We also video recorded the patient, to review the interventions, and observe any changes in the quality of movement. See *Table 1* below, for results of the above outcome measures used.

### WHAT RESOURCES DID WE NEED?

To provide the level of input required we needed a full complement of OTs and PTs: at our unit this reflects the BSRM (2009) and BASP (2010) recommendations of one therapist to five patients, as well as full time OT and PT assistants. We also relied on flexibility from the rest of the MDT as the two week period involved the equivalent of full time work for the patient on only his arm. Speech and language therapy and psychology therefore had to largely withdraw. This was discussed and agreed within our multi-disciplinary team meeting. For this patient, no dilemma arose, as he was receiving minimal input from other disciplines with his outstanding goals being physical. In a different case where other disciplines were more heavily involved, more flexibility maybe required and perhaps a more modified CIMT approach adopted. The most significant resource was time – not only during the treatment period but also in set up – we needed to designate protected CPD time and work was also completed during the therapists' own time in order to prepare and set up the programme. However, now this has been done once, the workload for the next patient will be significantly less. Minimal equipment was required – only standard upper limb rehab equipment/functional equipment and games such as those found around the unit in the kitchen, garden, bathroom etc.

### WHAT DID WE LEARN ABOUT THE PROCESS?

### **Preparation/timing**

- CIMT does appear to be a feasible treatment option within an NHS setting but it does require a lot of preparation and organisation both prior to the programme and during it.
- Providing the intervention at the end of the patient's stay was very effective for us not only from a mobility point of view but it also allowed the team to get to know the patient before starting the programme. This is essential to know when to push them, when rest is required, when to abandon an exercise because it is too hard and when to persevere because the challenge they're undergoing is part of the process of improvement.

### A flexible approach

- Flexibility is required by the therapists involved in order to adapt quickly to early changes and improvements – exercises that were challenging on day one were easy by day three.
- Not every session goes ahead as planned. Although independent sessions were timetabled,

OUTCOME MEASURE	PRE CIMT	POST CIMT	SIGNIFICANCE
<b>COPM</b> based on writing, toilet hygiene, feeding himself and holding a steering wheel.	Performance: 2/10 Satisfaction: 1.4/10	Performance: <b>6.4/10</b> Satisfaction: <b>7.4/10</b>	A change of <b>two or more points</b> is considered clinically significant (Law <i>et al</i> 2004) as cited in Bodiam 1999).
Jebson test of hand function	<b>10</b> (standard deviations from normal).	2 (standard deviations from normal) between -2 and 2 considered to be within normal range.	This degree of improvement represents an increase in speed to perform seven dextrous, functional tasks of between <b>110</b> <b>and 141.2 seconds.</b>
NHPT average of three attempts.	54.9 seconds no drops.	28.9 seconds no drops.	Normative values would be completion within <b>18.8 seconds</b> (Mathiowetz 1985). Minimal clinically important difference has not been established.
<b>Dynanometry</b> gross grip, average of three attempts.	41.3 pounds	56.6 pounds	Normative values would be 109.9 pounds.

they were not always completed, and certainly not for a full hour, because of fatigue and frustration. In addition the sessions supervised by the patient's wife were not always completed – on reflection the team would not use a patient's partner in an inpatient setting again. Although she was very keen to help, what our patient needed when she visited was someone to offload to about the frustrations of his day and how hard the exercises were. In future we hope one session each evening could be completed by a rehabilitation assistant during a quiet period to keep the supervised sessions to four hours a day. This would also be better for a patient with no regular visitors.

### The intervention

- Very close communication between all those working with the patient is vital to ensure the programme is pitched at the correct level throughout.
- CIMT is essentially a hands-off approach. As Bobath influenced therapists, this is quite a challenge. Abnormal movement patterns are highly likely to be employed by the patient but through exploring the use of their upper limb and problem solving for themselves on how to complete tasks, neuroplastic changes are facilitated and the patient's movement should begin to normalise. As physically helping the patient is avoided, pitching the activities at the right level is important so that tasks are difficult but not impossible.
- The element of competition is vital timing tasks and racing against a target as dictated by the shaping activities is crucial in maintaining the interest of the patient. Even with the knowledge that repetition is vital for plasticity (Kleim *et al* 1998, Kleim & Jones 2008, Sadowski 2008) and improvement, boredom is potentially a major problem. In our experience the greater the variety of tasks and exercises that have been prepared, the better because although repetition is key, novel tasks have also been shown to promote cortical plasticity (Adkins 2006). See *Appendix 1* for some examples of exercises used.

### **Outcomes**

- Our outcome measures demonstrated substantial improvements but most telling were the videos of the intervention showing change in the quality of movement in the tasks/exercises completed on day one compared with day fourteen. With hindsight we would video and time one or two of the tasks identified in the COPM to show an objective change in the tasks that were most relevant to the patient.
- Subsequent to the described CIMT programme we have provided MDT in-service training on

what CIMT is and fed back the experiences highlighted here. This has increased our MDT's awareness of CIMT as a treatment tool and the roles they can play within it ie encouraging the patient, watching for mitt wear, being supportive during functional tasks – nursing staff may need to help a patient more with ADLs during their CIMT period than they had been previously.

### **PROS AND CONS AND PATIENT SELECTION**

Trialling CIMT within our unit following the EXCITE trial example (Wolf *et al* 2006, 2008) has highlighted to the team several areas for further consideration – particularly regarding the inclusion criteria:

- The EXCITE trial (Wolf 2006, 2008) actually has lower level mobility criteria (independent toilet transfer, independent sit to stand and two minutes independent standing balance) than many other studies which require the patient to be independently mobile (van der Lee et al 1999). A high level of mobility proved beneficial for CIMT in our experience, as it meant less time spent with the mitt off (ie if a walking aid is required, the mitt cannot be worn while walking - this would limit use of the affected upper limb in automatic tasks like opening doors, turning on light switches etc). Having a mobile patient also increased the scope for a greater variety of exercises ie more dynamic tasks like throwing a ball against the wall and picking it up off the floor when dropped, as well as dynamic standing tasks. Despite this, the team felt that CIMT could be adapted for a wheelchair user. This may tax the imagination of the therapist and patient more, in order to come up with sufficient variety of tasks, but a CIMT programme in our experience may well serve to improve a patient's trunk and therefore, potentially, their functional level, by increasing the involvement of the affected side in activities of daily living.
- Conversely, within an inpatient service, if the patient has the potential to improve their mobility it is difficult to completely prioritise (as is required for traditional CIMT) the upper limb over mobility - from a discharge planning point of view as well as from the patient's perspective. Perhaps for this type of patient, CIMT would be better provided within the community at a later stage or perhaps a modified version of CIMT could be considered, involving fewer hours of massed practice daily. This might be particularly relevant in light of recent protocol changes now being employed by the originators of CIMT in America. They now favour three hour training programmes rather than six hours although mitt wearing continues to be aimed at 90% of waking

hours (Morris 2011). This training schedule may make CIMT easier to apply in the inpatient NHS environment.

• The majority of articles on CIMT thus far, have studied patients with stroke. Various studies have looked at patients at different lengths of time post-stroke and some other patient groups have been studied eg multiple sclerosis (Mark et al 2008) and traumatic brain injury (TBI) patients (Page 2003). TBI patients are now eligible, alongside stroke patients, for Dr Edward Taub's Therapy Clinic. In addition to these patient groups, CIMT could perhaps be applied to others eg post excision of a space occupying lesion, or patients with an encephalopathy or infection. Anyone presenting with unilateral upper limb weakness that is motivated, cognitively intact and has some return of functional movement and has the potential to improve could, in theory, benefit.

### CONCLUSION

As a unit we now feel confident and are set up, ready to provide a two week intensive CIMT programme for appropriate patients. This article has detailed our first experience of applying CIMT to an inpatient setting within the NHS. We faced the day to day difficulties of real-life NHS work rather than the controlled environment of a research trial. What I have strived to do is share our qualitative experience of the practicalities including the barriers and difficulties of trying to apply evidence based practise into our clinical work in the hope that it will encourage readers to also try the approach because the effects were quite extraordinary.

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### REFERENCES

Adkins DL, Boychuk J, Remple MS and Kleim JA (2006) *Motor training induces experience– specific patterns of plasticity across motor cortex and spinal cord* Journal of Applied Physiology 101(6) pp1776–1782.

Bodiam C (1999) The use of the Canadian Occupational Performance Measure for the assessment of outcome on a neurorehabilitation unit British Journal of Occupational Therapy 62(3) pp 123–126. Bovernd'Eerdt TJH, Dawes H, Johansen-Berg H and Wade DT (2001) Evaluation of the Modified Jebsen Test of Hand Function and the University of Maryland Arm Questionnaire for Stroke Clinical Rehabilitation (18) pp 195-202.

British Association of Stroke Physicians (2010) *Stroke Service Standards* Clinical Standards Committee [online] Available at: http://www.basp.ac.uk/Link Click.aspx?fileticket=%2FKYTI cgdxg0%3D&tabid=653&mid =1053 [Accessed 14 July 2011] British Society of Rehabilitation Medicine (2009) Standards for Rehabilitation Services Mapped onto the National Service Framework for Long-Term Conditions Royal College of Physicians. London, UK [online] Available at: http://www.bsrm.co.uk/ Publications/StandardsMapping-Final.pdf [Accessed 18 July 2011]

Cup EH, Scholte op Reimer, WJ, Thijssen MC and van Kuyz–Minis MA (2003) *Reliability and validity* of the Canadian Occupational Performance Measure in stroke patients Clinical Rehabilitation 17(4) pp 402–409.

Harrison Training (2010). How To Do Constraint Induced Movement Therapy www.harrisontraining.co.uk

Hartigan I, O'Connell E, McCarthy G and O'Mahony D (2010) First time stroke survivors' perceptions of their health status and their goals for recovery International Journal of Nursing and Midwifery 3(1) pp22–29.

Heller A, Wade DT, Wood VA, Sunderland A, Langton Hewer R and Ward E (1987) *Arm function after stroke: Measurement and recovery over the first three months* Journal of Neurology, Neurosurgery and Psychiatry (50) pp714–719.

Jebsen RH, Taylor N, Trieschmann RB and Howard LA (1969) *An objective and standardised test of hand function* Archives of Physical Medicine and Rehabilitation 50(6) 311–319.

Kellor M, Frost J, Silberberg N, Iversen I and Cummings R (1971) Hand strength and dexterity American Journal of Occupational Therapy (25) pp77-83.

Kleim JA, Barbay S and Nudo RJ (1998) Functional reorganisation of the rat motor cortex following motor skilled learning Journal of Neurophysiology (80) pp3321–3325.

Kleim JA and Jones TA (2008) Principles of exercise-dependent neural plasticity: Implications for rehabilitation after brain damage Journal of Speech, Language and Hearing Research (51) ppS225-S239.

Kwakkel G, Meskers CGM, van Wegen EE, Lankhorst GJ, Geurts ACH, van Kuijk AA, Lindeman E, Visser-Meily A, de Vlugt E and Arendzen JH (2008) *Impact of early applied upper limb stimulation: The EXPLICIT-stroke programme design* BioMedCentral Neurology 8(49).

Law M, Baptiste S, Carswell A, McColl MA, Polatajko H and Pollock N (1994) Canadian Occupational Performance Measure (2nd ed.) Toronto, ON: CAOT Publications ACE as cited in Bodiam C (1999) The use of the Canadian Occupational Performance Measure for the assessment of outcome on a neurorehabilitation unit British Journal of Occupational Therapy 62(3) pp 123–126.

Mark WW, Taub E, Bashir K, Uswatte G, Delgado A, Bowman MH, Bryson CC, McKay S and Cutter GR (2008) *Constraint Induced Movement Therapy can improve hemiparetic progressive multiple sclerosis. Preliminary findings* Multiple Sclerosis 14(7) pp992–994.

Mathiowetz V, Weber K, Kashman N and Volland G (1985) *Adult norms for the nine hole peg test of finger* The Occupational Therapy Journal of Research 5(1) pp25–38.

Morris DM, Taub E and Mark VW (2006) *Constraint-induced movement therapy: characterizing the intervention protocol* Europa Medicophysica (42) pp 257–268.

Morris DM (2011) Evidence-based therapy for arm recovery and function post stroke: CIMT University of Ulster 8th-11th March.

National Institute for Health and Clinical Excellence (NICE) 2010 *Stroke Quality Standards* [online] Available at: http://www.nice.org.uk/

aboutnice/qualitystandards/ stroke/strokequalitystandard.jsp [Accessed 18 July 2011]

Page S (2003) Forced use after TBI: Promoting plasticity and function through practise. Brain Injury 17(8) pp675-684.

Rudd AG, Jenkinson D, Grant RL and Hoffman A (2009) *Staffing levels and patient dependence in English stroke units* Clinical Medicine 9(2) pp110–115.

Royal College of Physicians (RCP) Intercollegiate Stroke Working Party (2007) National Sentinel Stroke Audit Phase I (organisational audit) 2006 Phase II (clinical audit) 2006. Clinical Effectiveness and Evaluation Unit, Royal College of Physicians London, UK [online] Available at: http://bookshop.rcplondon.ac.uk/ contents/d1301a83-729b-4342af1c-3213587f4c22.pdf [Accessed 17 July 2011].

Royal College of Physicians (RCP) Intercollegiate Stroke Working Party (2008) *National Clinical Guidelines for Stroke 3rd Edition*. Clinical Effectiveness and Evaluation Unit, Royal College of Physicians London, UK [online] Available at: http://bookshop.rcplondon.ac.uk/

contents/6ad05aab-8400-494c-8cf4-9772d1d5301b.pdf [Accessed 18 July 2011]. Sadowski B (2008) *Plasticity of the Cortical Motor System* Journal of Human Kinetics (20) pp 5–21.

Sunderland A, Tinson D, Bradley L and Langton Hewer R (1989) *Arm function after stroke. An evaluation of grip strength as a measure of recovery and a prognostic indicator* Journal of Neurology, Neurosurgery and Psychiatry (52) pp 1267–1272.

Taub E, Uswatte G and Pidikiti R (1999) *Constraint–Induced Movement Therapy: A new family of techniques with broad application to physical rehabilitation – a clinical review* Journal of Rehabilitation, Research and Development 36(3) pp237-251.

Taub E, Uswatte G, King DK, Morris D, Crago JE and Chattergee A (2006) A Placebo-Controlled Trial of Constraint-Induced Movement Therapy for Upper Extremity After Stroke Stroke (37) pp1045-1049.

Tuke A (2008) *Constraint induced movement therapy: a narrative review* Physiotherapy (94) pp105– 114.

University of Alabama (UAB) Taub Therapy Clinic, Birmingham Hospital, Alabama [online] Available at: http://www.taubtherapy.com/ [Accessed 25 July 2011]

Van der Lee JH, Wagenaar RC, Lankhorst GJ, Vogelaar TW, Deville WL and Bouter LM (1999) Forced Use of the Upper Extremity in Chronic Stroke Patients: Results From a Single Blind Randomized Clinical Trial Stroke (30) pp 2369– 2375. Wolf SL, Winstein CJ, Miller JP, Taub E, Uswatte G, Morris D, Giuliani C, Light KE and Nichols-Larsen D (2006) *Effect of Constraint – Induced Movement Therapy on Upper Extremity Function 3 to 9 Months After Stroke: The EXCITE Randomized Clinical Trial* Journal of the American Medical Association 296(17) pp 2095–2104.

Wolf SL, Winstein CJ, Miller JP, Thompson PA, Taub E, Uswatte G, Morris D, Blanton S, Nichols-Larsen D and Clark PC (2008) The EXCITE Trial: Retention of Improved Upper Extremity Function Among Stroke Survivors Receiving Cl Movement Therapy Lancet Neurology 7(1) pp 33-40.

EXERCISE	DESCRIPTION	SHAPING TASKS
Mini Solitaire	Dexterity task focusing on pincer grip – picking up and moving small pegs between holes on a board.	Increase speed by timing, change height of board ie place on a block, change distance from patient.
Pick up Sticks	Dexterity task focusing on pincer grip accuracy, trying to pick up sticks without moving the other sticks around it.	Speed, change distance moved, change size of sticks eg matchsticks
Counters and jar	Picking up counters from a jar and placing them on the table and vice versa.	Change height of jar, speed, change type of counter – use coins, change distance of jar from patient.
Counters	In hand manipulation – pick up counters one at a time, gradually increasing the number held in the hand – release one at a time.	Use coins or smaller counters, release into a target of varying size, pick up from different surface / container, distance from patient.
Nut and bolt	Flower press with wing nuts on bolts, patient screws the nut down then back up.	Speed, use standard nut rather than wing nut, distance of press from patient.
Cards	Turn over individual playing cards.	Speed, distance of pack from patient, size of cards, lay cards out individually or in a pile.
Marbles	In hand manipulation – as counters task.	Use different size marbles, use different shape objects such as pens or paperclips.
Keys	In hand manipulation of key to undo locks of cupboards/drawers at various heights therefore also range of movement and strength.	Start with low cupboards and build up to higher ones, vary number of keys on key ring, speed, distance patient stands from cupboard.
Writing	Writing grip.	Follow pattern with index finger if writing too difficult, adapted pens, start with large patterns/letters and reduce size, mazes.
Cupboard and fridge	Open and close cupboards/fridge and unload then reload items in and out of cupboards/fridge.	Start with lower shelves/cupboards and build up to higher ones, different size, weight and shape items, vary distance patient stands from cupboard.

Appendix 1 Examples of exercises

# **Use of Botulinum toxin** in the treatment of elbow flexor spasticity in acute stroke – a case report

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### ABSTRACT

This case report describes the use of botulinum toxin A (BT–A) in the treatment of elbow flexor spasticity in a 69 year old male, who suffered a large right middle cerebral artery infarct. The patient had BT–A administered eight weeks post stroke, alongside 45 minutes daily physiotherapy and a splinting regime, as an in–patient on the stroke unit. A variety of measurement tools, including goniometry, Tardieu Scale, Numeric Graphic Rating Scale, photography and Goal Attainment Scale (GAS), were used before BT–A, and repeated on day 14 and day 28 post injection, to assess the different components of spasticity and its impact on function. BT–A was found to be safe and efficacious in reducing elbow flexor spasticity in this case. Improvement in patient centred goals was found, with better than expected GAS scores at 28 days post BT–A, including a 40° increase in passive range of movement, a reduction in pain, greater tolerance of splinting, reduction in carer burden and improved positioning. The integrated multi disciplinary team involvement essential for best practice in spasticity management makes it difficult to distinguish the effects of separate therapeutic components in relation to the outcomes. Clinical trials investigating the use of BT–A early post stroke remain scarce and further research is warranted.

Key words: Botulinum toxin A, spasticity, stroke, elbow flexors.

Spasticity is defined as 'a velocity-dependent increase in tonic stretch reflexes' (Lance 1980). It can be painful, distressing, and a potentially costly cause of disability. It may contribute to secondary complications including impaired function, contracture, pressure ulcers and reduced quality of life (Moore *et al* 2003). Nineteen percent of patients after stroke are reported to have spasticity at three months and thirty-eight percent after one year (Watkins *et al* 2002). Recent data suggest that spasticity may develop within a week following stroke (Malhotra *et al* 2008).

BT-A is recommended as an effective treatment for focal spasticity, without affecting sensation or the associated systemic side-effects of other antispasmodic agents (RCP 2009). A meta-analysis of 36 studies has demonstrated both its efficacy and safety (Naumann and Jankovic 2004). BT-A aims to reduce spasticity by blocking acetylcholine release at the neuromuscular junction, thereby inducing muscle weakness (Barnes 2003). Collateral nerve sprouting eventually enables the nerves to re-innervate the muscle. In clinical terms the effects of the BT-A injection last around three to four months (Moore *et al* 2003). There is strong evidence from randomised control trials (RCTs) that BT-A reduces upper limb (UL) spasticity post stroke (Childers *et al* 2004, Bakheit *et al* 2000, Smith *et al* 2000, Simpson *et al* 1996). There is also a growing body of evidence demonstrating how the reduction of spasticity translates into functional benefits in terms of reduction in disability, carer burden and improvements in goal achievement (McCrory *et al* 2009, Francis *et al* 2004, Brashear *et al* 2002, Bhakta *et al* 2000).

In routine clinical practice BT-A tends to be given once the clinical signs of spasticity have become established which is usually several months post stroke. By this time secondary complications such as pain and contractures are likely to become established (Cousins *et al* 2010). The RCP guidelines (2009) suggest appropriate use of BT-A in the early phases of rehabilitation may prevent soft tissue shortening and potentially help to avoid learned disuse and facilitate neurological recovery. Early treatment may also reduce the costs of long term care. In order to evaluate the effectiveness of treatment intervention it is important to record valid and reliable data about spasticity and its effects on function. Much debate exists in the literature regarding the measurement tools available and their clinical relevance (Haugh *et al* 2006, Morris 2002). The RCP guidelines (2009) suggest the use of a battery of tools to address the different components of spasticity and its impact on function.

This case report aims to demonstrate the early use of BT-A in the treatment of UL spasticity eight weeks post stroke. The measurement tools used include, goniometry, Tardieu Scale, Numeric Graphic Rating Scale, Photography and Goal Attainment Scale.

### **PATIENT CASE PRESENTATION**

Patient A, is a sixty-nine year old male who suffered a large right middle cerebral artery infarct resulting in a dense left (L) hemiplegia. He had no significant past medical history and was fully independent prior to his stroke. He was an inpatient on the stroke unit for a total of fourteen weeks where he was under the care of a stroke specialist multi-disciplinary team (MDT). Eight weeks post stroke, he was making good progress in some aspects of rehabilitation and was able to stand and transfer with assistance of one. However, his (L) UL remained non-functional, with no selective voluntary activity. He developed pain

### IMPAIRMENTS

- (L) elbow flexor spasticity.
- Decreased passive range of movement (PROM) (L) elbow extension.
- No voluntary active movement throughout (L) UL.
- Pain in (L) arm around biceps brachii.
- Associated reactions into (L) elbow flexion during effortful tasks.
- **ACTIVITIES: PASSIVE FUNCTION**
- No functional use (L) UL.
- Difficulty putting (L) arm through sleeve and dependent on carer for assistance with dressing.
- Unable to tolerate elbow extension splint; causing pain and redness on the skin with pressure markings as the arm pulled into elbow flexion against the splint.
- Difficulty achieving or maintaining good positioning of the (L) UL in bed and when sitting in the wheelchair.

### PARTICIPATION

- Dependent on a carer for (L) UL dressing and positioning.
- Reduced tolerance sitting out in wheelchair, greater time in bed and decreased social interaction.

and spasticity in his (L) UL. The impact of the UL spasticity will be the focus of this case report and has been classified according to the International Classification of Functioning, Disability and Health (ICF) (WHO, 2001), see *Table 1* below.

### **CLINICAL EXAMINATION**

On examination eight weeks post stroke the muscle involvement in the spasticity appeared relatively focal to the elbow flexors. On palpation biceps brachii and brachioradialis felt particularly overactive.

Initial spasticity management involves excluding any aggravating factors such as, constipation, infection or pain. This is because spasticity results partly from the abnormal processing of sensory input and nociceptive stimuli, therefore such factors can exacerbate spasticity and make it harder to treat (RCP 2009). Patient A complained of pain at the site of biceps brachii and therefore regular paracetamol was given for analgesia, no other aggravating factors were found. However, despite reducing the pain, the spasticity remained unchanged. The MDT agreed that a predominantly neural component was evident at the elbow flexors because the resistant to passive elbow extension was velocity dependent. This was differentiated from the non-neural component ie the mechanical restraint of soft tissues, by assessment of slow and fast passive range of movement and recorded with the Tardieu Scale.

### **MEASUREMENTS**

The Tardieu Scale (Haugh *et al* 2006) was selected to measure spasticity as it has been suggested that it provides higher intra-rater and inter-rater reliability compared with the Modified Ashworth Scale (Mehrholz *et al* 2005). The Tardieu Scale also aims to measure the relative contribution of the velocitydependent neural mechanisms ie spasticity (V3) and the mechanical restraint of soft tissues ie passive range of movement (PROM (V1)). It is therefore suggested as a more valid spasticity scale. However, a key criticism is that it is time-consuming; rating was therefore limited to V1 and V3 as recommended (RCP 2009). The position of the patient was standardised in sitting on each test and range of movement was measured with goniometry.

Arm pain around biceps brachii was graded using the Numeric Graphic Rating Scale (NGRS) (RCP 2009) where by; 0 = no pain and 10 = mostsevere pain.

### **PATIENT GOALS**

Four priority goals were determined through collaborative agreement with the patient and MDT before the injection therapy. Please refer to *Table 2*.

GAS SCORE	GOAL 1: PROM	GOAL 2: PAIN	GOAL 3:DRESSING	GOAL 4: SPLINTING
+2	Increase PROM of (L) elbow extension by 30°	Achieve a reduction in pain score by 5 or more points	Put (L) arm through sleeve independently with ease	Tolerate (L) arm splint for greater than 6 hours per day
+1	Increase PROM of (L) elbow extension by 20°	Achieve a reduction in pain score by 3 to 4 points	Put (L) arm through sleeve independently with difficulty	Tolerate (L) arm splint for 6 hours per day
0	Increase PROM of (L) elbow extension by 10°	Achieve a reduction in pain score by 1 to 2 points	Put (L) arm through sleeve with minimal assistance of 1	Tolerate (L) arm splint for 4 hours per day
-1	Maintain PROM of (L) elbow extension at 140°	Achieve no change in pain score (7/10)	Put (L) arm through sleeve with moderate assistance of 1	Tolerate (L) arm splint 2 hours per day
-2	Decrease PROM of (L) elbow extension to less than 140°	Achieve an increase in pain score by 1 or more points (>7/10)	Put (L) arm through sleeve with maximum assistance of 1	Not able to tolerate (L) arm splint

KEY: +2 Much better than expected +1 Better than expected 0 Expected target goal -1 Worse than expected -2 Much worse than expected

#### Table 2 GAS Scale

The Goal Attainment Scale (GAS) (Ashford and Turner-Stokes 2006) was selected as it provided an individualised measurement approach. The validity and reliability of the scale has been demonstrated in other settings and preliminary studies support that it provides a useful measure of functional gains in response to treatment of spasticity with BT-A (Ashford and Turner-Stokes 2006). The goals were reviewed with the patient and measured weekly. The numerical rating of the goals helps clearly identify areas of progression, plateau or deterioration. The patient's goals were also discussed at weekly MDT care planning meetings as part of the integrated team-work approach in spasticity management during stroke rehabilitation.

### **INTERVENTION**

The MDT agreed that BT-A would be an appropriate treatment selection for Patient A's focal spasticity. Following patient written consent, BT-A was injected intramuscularly into biceps brachii and brachioradialis. Although BT-A is reported to diffuse into active neuromuscular junctions within the muscle, endplate targeting has been reported to potentiate BT-A effects (Gracies et al 2002). Deshpande et al (2006) described the endplates of biceps brachii as an inverted V-shaped band just below the midpoint of the humerus. Utilising this and knowledge of anatomical landmarks, 60 units of Botox® was injected between two sites targeting both heads of biceps brachii. Electromyography (EMG) injection guidance, as recommended for muscles more difficult to locate (Wissel et al 2009), was used for brachioradialis where 40 units of Botox® was injected at a single site. Relatively low doses within the recommended range (RCP 2009)

were selected due to this being the initial treatment and the acute nature of the stroke. A dilution volume of 2mls per 100 units of Botox® was selected due to muscle size.

Brachialis was not injected as it has been suggested that it has weaker elbow flexion power and provides muscular protection of the joint, ensuring contact between the articular surfaces over the flexor aspect (Huber and Heck 2008). Mayer *et al* (2008) interestingly found reduced activity in brachialis post injection of biceps brachii and brachoradialis, suggesting leakage of the toxin to adjacent muscles.

The clinical effect of BT-A occurred gradually over seven days as expected (Barnes 2003). It is widely recognised and emphasized throughout the national guidelines that BT-A should be used in parallel with an integrated MDT management plan (RCP 2009). Indeed Giiovanelli et al (2007) suggest that physiotherapy in combination with BT-A can significantly improve overall response. Patient A attended forty five minute daily physiotherapy sessions, Monday to Friday, throughout his fourteen week hospital stay. Following RCP (2009) spasticity guidelines, (L) elbow extension stretching exercises and splinting were carried out, despite the controversy in the literature that exists with regards to their benefit (Katalinic et al 2011; Bovend'Eerdt et al 2008). Physiotherapy also played an important role in advising the MDT, patient and family on careful handling and positioning, contributing to the maintenance of muscle length, control of pain and spasticity.

An elbow extension splint was made on day seven post BT-A as recommended (RCP, 2009). Splinting provides a prolonged stretch aiming to improve muscle length. Optimal duration is unclear, however, some evidence suggests splints should be worn for at least six hours, therefore, it was aimed that tolerance towards this would gradually be reached (Tardieu *et al* 1988). *Figure 1* displays the elbow extension splint in situ.



Figure 1 Supine with elbow extension splint in situ

Nurses, occupational therapists and stroke physicians are examples of other key members of the MDT who were involved in the coordinated management of spasticity. For example the occupational therapists played an important role in splinting and provision of seating. Nurses were responsible for implementing positioning programmes and careful handling of the patient throughout the 24-hour period, and the stroke physician was involved in on-going medical management, including analgesic review.

### RESULTS

Measurements were recorded prior to BT-A injections, on day 14 and day 28 post injection, in line with follow-up recommendations (RCP 2009). They were repeated at the same time of day and by the same rater. *Tables 3*, *4* and *5* (overleaf) display the assessment findings.

Photographs were taken to illustrate any changes pre and post treatment, particularly with regards to positioning of the (L) arm in bed and when sitting in the wheelchair. The photographs displayed in *Figures 2 to 4* clearly illustrate the improvement in positioning from pre- BT-A to day 28.

### DISCUSSION

The injections were well tolerated and no adverse effects were found in patient A, consistent with the results of a meta-analysis by Naumann and Jankovic (2004). A reduction in elbow flexor spasticity was demonstrated by increases in the angle at which the muscle reaction occurs (Y angle, *Table 3*) and decreases in the spasticity angle on the Tardieu Scale at day 14, with further improvement found at day 28 post BT-A. This suggests that



Figure 2 Supine: pre-BT-A



Figure 3 Supine: 28 days post-BT-A



Figure 4 Sitting in wheel chair pre-BT-A (left) and post-BT-A (right)

BT-A in conjunction with the integrated MDT management was effective in reducing spasticity, supporting previous RCT's in stroke (Brashear *et al* 2002, Bakheit *et al* 2000, Bhakta *et al* 2000

TIMESCALE	VI:SLOW AS POSSIBLE PROM ELBOW EXTENSION	V3: FAST AS POSSIBLE Y: ANGLE AT WHICH MUSCLE REACTION OCCURS	<b>V1 – V3</b> Spasticity angle	X: QUALITY OF MUSCLE REACTION
Pre BT-A	140°	90°	50°	2
Day 14	160°	120°	40°	2
Day 28	180°	155°	25°	2

### Table 3 Tardieu Scale for (L) elbow flexors

ENSION

Table 4 NGRS (L) arm pain

TIMESCALE	GOAL 1:PROM	GOAL 2: PAIN	GOAL 3: DRESSING	GOAL 4: SPLINTING
Pre BT-A	-1	-1	-1	-2
Day 14	+1	+1	0	0
Day 28	+2	+1	+1	0
Table 5 GAS scores				

Smith et al 2000, Simpson et al 1996). The large difference of 50° found between V1 and V3 on the Tardieu Scale pre-BT-A was suggestive of a large dynamic and neural component; whereas smaller differences have been suggested to represent a more mechanical restraint of the soft tissues (Morris 2002). It is important to note that the level of pain around biceps brachii on passive elbow extension (V1) was limiting PROM and hence measurement of soft tissue length was difficult to assess. The impact of decreased pain levels must therefore be considered when viewing the improvements found in PROM post BT-A. The quality of muscle reaction (X = 2, Table 3)remaining at day 28, shows no change in the quality component of the measure, however this should be analysed with caution. A systematic review of the Tardieu Scale questioned the relationship of the categories to assess quality and found that this part of the scale was not even used in five of the ten papers reviewed (Haugh et al 2006).

The pain score reduced more than expected to 3/10 NGRS, by day 28 post injection, supporting analgesic effects of BT-A (Barnes 2003). Relief of spasticity and increased freedom of movement at a joint have been reported to be likely contributors to pain relief (Bhakta *et al* 1996). However, McCrory *et al* (2009) and Bhakta *et al* (2000), found no significant improvement in pain following BT-A compared with placebo in their RCTs. It is important to note that in this case report, patient A's analgesia was changed concomitantly, with the inclusion of Buprenorphine (BuTrans® 10 patch). This makes assessment of BT-A's contribution to relief of pain difficult and is recognised as a limitation.

A reduction in elbow flexor spasticity seemed to correlate with increasing ease of putting arm through sleeve and reducing carer burden. This was demonstrated by improvement in goal three to +1 on the GAS, thus supporting a RCT that found a reduction in disability and carer burden following BT-A (Bhakta *et al* 2000).

Patient A gradually increased tolerance to the splint and the expected target was achieved for goal 4 on GAS by day 28. Better than expected changes in GAS scores were found for goals 1 to 3 at day 28. This suggests that the reduction in spasticity translated into improving the ability to achieve patient centred goals, supporting previous findings (McCrory et al 2009, Ashford and Turner-Stokes 2006). A probable reason for greater than expected changes may be that alongside the reduction in spasticity, other factors also improved including reduction in pain, improved positioning, greater tolerance of splinting and therapy. Greater recovery expected in the acute stage post stroke also needs to be considered. Research, however, into the use of BT-A in the acute phase remains scarce (Cousins et al 2009).

Patient A was discharged home from hospital, following a 14-week stay, to care of the community physiotherapy team, who provided ongoing followup. The management plan was to review the patient at the spasticity clinic in three to four months post BT-A as recommended (RCP 2009), as it was anticipated that the effects of the BT-A may have worn off (Moore et al 2003). It would therefore be important to assess whether functional levels had been maintained with ongoing physiotherapy, splinting and positioning regimes. It would also be prudent to consider whether further injections are indicated, particularly with the acute nature of the stroke and better than expected achievements in GAS after 28 days. Thorough re-assessment and use of outcome measures are key to inform the clinical reasoning at this point; repeated injections if indicated are recommended at no less than three month cycles (RCP 2009).

### CONCLUSION

BT-A was found to be safe and efficacious in reducing elbow flexor spasticity post acute stroke, which translated into higher GAS scores. This was reflected by an improvement in the ability to achieve patient centred goals 28 days post BT-A, including increased PROM, a reduction in pain, greater tolerance of splinting, ease of putting affected arm through sleeve, reduction in carer burden and improved positioning. The integrated MDT involvement essential for best practice in spasticity management makes it difficult to distinguish the effects of separate therapeutic components in relation to the outcomes in this single case study design.

### **KEY POINTS**

- BT-A used early post stroke may benefit patients with focal spasticity.
- BT-A should be used in parallel with an integrated MDT management plan.
- BT-A used alongside physiotherapy, splinting and positioning regimes was beneficial in the management of focal elbow flexor spasticity in this individual.
- Valid and reliable outcome measures to address the different components of spasticity and its impact on function should be used.
- GAS captured personally relevant achievements in response to treatment of spasticity with BT-A.

### **Conflict of interest**

The author received financial support from Allergan to attend the Injection Therapy Masters Module at the University of Coventry. Allergan have had no involvement in the preparation of this case study.

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# **Pusher Syndrome:** a relevant issue in stroke rehabilitation

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Upon sitting upright the gentleman vigorously extended his non-affected upper and lower extremities, pushing upon the plinth as though to resist an imminent fall towards his unaffected side - despite the presence of a reassuring physiotherapist sitting next to him. This was what I witnessed during my first week of a practice based learning placement within an acute stroke unit, and I was left pondering the behaviour of this patient who had suffered a right-sided total anterior circulation stroke (TACS). At first I could not fathom why the person acted in this way - why would someone with a marked left-sided hemiplegia be so determined to actively push his way onto his affected side? I learned that the patients behaviour was characteristic of something called 'pusher syndrome' - my immediate interest lead me to investigate this phenomenon further, and was nurtured over the course of a stimulating and enjoyable placement. My experience has since motivated me to write the following article.

The term 'pusher syndrome' (PS) as named by Davies (1985) is used to describe the performance of pushing behaviour towards the paretic side of the body (contralateral to the cortical lesion) using the unaffected upper and/or lower limbs, and is commonly observed by neurological physiotherapists in hemiplegic stroke patients. Furthermore, attempts by physiotherapists' to manually correct sitting posture in such circumstances are often met with significant resistance from patients, who have been reported to express a fear of falling towards their non-affected side (Karnath et al 2000). Such 'contraversive pushing' may result in loss of postural balance within the frontal plane, causing the individual to fall laterally towards their paretic side upon upright sitting, standing or when performing transfers (Karnath et al 2000,

Karnath & Broetz 2003, Paci *et al* 2009). Indeed, it is likely that physiotherapists are often among the first health professionals to witness pusher behaviour (PB) in clinical settings, considering that initial medical assessment upon patient admission following acute stroke is often performed with the patient in supine (Karnath 2007).

PS is often mistaken for similar postural disorders associated with neurological injury, such as 'listing' whereby patients experience a loss of sitting balance towards their paretic side secondary to muscular weakness, rendering them unable to maintain static equilibrium (Karnath & Broetz 2003). As these individuals are able to recognise their loss of sitting balance they tend to 'pull' on objects using the non-paretic upper limb in order to correct sitting posture – not 'push' (Karnath & Broetz 2003). The active PB, which commonly manifests as abduction and extension of the non-affected limbs, as well as resistance to manual correction, differentiates PS from other balance disturbances (Karnath 2007).

### PATHOPHYSIOLOGY AND UNDERLYING MECHANISMS

The underlying epidemiology and aetiology of the disorder remain poorly understood, despite the topic receiving considerable focus within scientific literature during the past decade. Previously reported prevalence rates have varied extensively, ranging from 10 – 60% (Paci et al 2009). There is general consensus that PB can be attributed to a disturbed perception of verticality (Paci et al 2009). Specifically, it is believed that PS arises from an impaired perception of body orientation relative to gravity or 'behavioural vertical', derived from the processing of visual, vestibular and somatosensory afferent information (Paci et al 2009). The latter comprise the subjective verticals, which are: subjective visual vertical (SVV); subjective haptic vertical (SHV); and subjective postural vertical (SPV) (Paci et al 2009).

The finding that patients with PS demonstrate an intact SVV, evidenced by their ability to align their body's longitudinal axis with earth-vertical using visual environmental cues, implies the existence of a second graviceptive system responsible for processing afferent activity from the trunk from which SPV is derived (Karnath et al 2000, Karnath & Broetz 2003). Such afferent activity may arise from somatosensory receptors in the skin, golgi tendon organs and muscle spindles, as well as impulses transmitted via the renal, phrenic or vagus nerves generated from the inertia of mass within the body. Furthermore, patients with vestibular lesions who demonstrate a tilted SVV are still able to orientate themselves with earth vertical - implying the utilisation of an alternative graviceptive system (Karnath 2007).

In a study by Karnath et al (2000), patients with PS were found to perceive themselves as being upright (SPV) when tilted 18° towards the ipsilesional side upon a rotational seating device. So why then do patients with PS perform contraversive pushing in the presence of an ipsileisional bias of SPV? It is believed that PB arises as an attempt to compensate between a disturbed SPV and an intact SVV, as opposed to resolving this problem with weighted summation (Karnath & Broetz 2003). This notion is supported by the observation that PB diminishes when patients are deprived of visual input, thus eliminating the need to compensate (Karnath & Broetz 2003). Furthermore, this may explain the marked patient resistance encountered by physiotherapists when attempting to provide postural correction, as this may interfere with active compensatory attempts.

It has also been suggested that PB may arise via alternative mechanisms, such as when patients experience lateral instability upon standing or sitting upright secondary to aligning their body's longitudinal axis with an ipsilesional SPV (Karnath & Broetz 2003). Pérennou et al (1998) expressed that PS may arise from a cessation of contralesional afferent activity and its respective cortical processing, termed 'graviceptive neglect'. Although previous authors have implied a strong association between PS and spatial neglect, consensus indicates that neglect does not cause PS rather that PS is highly associated with neglect and aphasia in right and left hemisphere lesions respectively (Pederson et al 1996, Karnath et al 2000, Karnath & Broetz 2003). Clearly, establishment of the exact underlying mechanisms of PS awaits the results of future research, although current evidence provides a theoretical platform from which treatment strategies can be devised.

Previously considered as a relay station to other structures, it has been postulated that the poste-

rior lateral thalamus is predominantly involved in the control of upright body posture, and may represent the brain structure most commonly affected in PS (Dietz et al 1992, Karnath et al 2000, Karnath et al 2005). Therefore, this area is likely to be responsible for the processing of the aforementioned postural afferent activity. However, previous experimental studies have identified other brain areas which may be implicated in the disorder including the parietal and insular cortex, suggesting the existence of a complex processing loop with cortical as well as sub-cortical elements responsible for controlling upright body posture (Saj et al 2005, Paci et al 2009). Indeed, this multicomponential model may explain the strong association of PS with spatial neglect and aphasia (Paci et al 2009).

### **PHYSIOTHERAPY MANAGEMENT**

Despite the potential disruption of PS to the implementation of physiotherapy interventions in stroke rehabilitation, the disorder has a surprisingly favourable long-term prognosis, with previous studies having reported that such patients demonstrate a complete resolution of symptoms six-months following hospital admission (Karnath et al 2002). Although PS is not considered to influence rehabilitation outcomes, it can have a significant effect on the rate of recovery post-stroke, particularly in the early stages of rehabilitation. In the Copenhagen Stroke Study, which examined 327 stroke patients over a one year period, patients with PS took approximately four weeks longer to achieve the same functional level as their unaffected counter-parts (Pederson et al 1996). This delay in functional recovery represents longer periods of hospital stay and increased strain upon physiotherapy resources, illustrating a clear rationale for physiotherapeutic intervention specifically targeted at treating the disorder (Karnath 2007).

The finding that the integrity of SVV is preserved in patients with PS has led to the proposal of a treatment approach which utilises this ability to correct their disturbed postural body orientation (Karnath & Broetz 2003). The ipsilesional bias of SPV in patients with PS means that a perceived 'upright' body posture corresponds to a tilted visual field - it is believed that this must be challenged primarily so that patients acknowledge that their visual input is representative of reality, and thus can identify their disturbed SPV (Karnath & Broetz 2003). Karnath and Broetz (2003) recommended the use of visual cues representative of 'earth vertical' within the therapeutic environment, such as the edges of window frames, doors, or even the use of a therapist's arm. Such

cues serve to promote awareness of the patients erroneous body posture and provide a reference point to which their longitudinal body axis can be aligned (Karnath & Broetz 2003). Once patients are able to assume a correct upright body posture using this method, the therapist may begin to incorporate non-affected upper limb activities such as reaching for objects, involving weight distribution to the ipsilesional side in order to minimise abduction and extension of the nonaffected limbs (Karnath & Broetz 2003, Broetz et al 2004). Upon mastery of the latter elements in sitting and standing, these may then be combined with distractive activities in order to progress to an autonomous stage of skill learning (Broetz et al 2004). Although high quality scientific studies supporting its efficacy are lacking, improvements in PB when using this treatment approach have been recorded by Broetz et al (2004), with eight acute stroke patients being able to stand with therapist assistance following 18 days of daily 30-minute treatment sessions.

It would appear that this strategy follows the motor re-learning approach to rehabilitation as opposed to one incorporating the Bobath method, and perhaps neglects the re-training of somatosensory graviceptive pathways as previously described – although alternative approaches have been suggested (Paci *et al* 2009). Panturin (2004), for example, suggested performing movement of the lower trunk upon a stationary upper trunk in order to stimulate graviceptive receptors involved in the control of SPV. The use of mirrors to promote patient awareness of erroneous body posture has also been described, although evidence supporting the effectiveness of this approach in PS is lacking (Trueland 2009).

A number of assessment tools exist, which can be used by physiotherapists to both diagnose PS and monitor patient progress through quantification of PB. The 'Scale for Contraversive Pushing' (SCP) by Karnath et al (2000) comprises of an ordinal scale which measures PB according to three variables: spontaneous body posture; extension of the unaffected arm/leg to increase the area of physical contact with the ground; and resistance to passive correction of posture to an upright position measured in both sitting and standing (Baccini et al 2008, Babyar et al 2009). Patients are considered to have PS if a score of 1 is achieved for each of the latter variables (Karnath & Broetz 2003). A recent systematic review of the literature supported the reliability, validity and clinical applicability of the SCP, as well as the 'Modified Scale for Contraversive Pushing' (MSCP) and the 'Burke Lateropulsion Scale' (BLS) (Babyar et al 2009). Furthermore, the MSCP and BLS were

considered to be most appropriate for monitoring changes in PB secondary to their wider metric ranges, whilst the SCP remained the most extensively tested measure of the three (Babyar *et al* 2009).

### CONCLUSION

In conclusion, PS is a problem that warrants intervention during rehabilitation following stroke, given its association with longer periods of hospital stay and delayed functional recovery. The need for future research is clear, especially to establish the efficacy of the aforementioned treatment approaches. Furthermore, having witnessed how effective evidence based management of PS by physiotherapists can accelerate functional recovery in such patients during my own practice based learning experiences, as a student physiotherapist I am motivated to tackle this problem upon entry into the profession.

### Acknowledgements

I would like to express my gratitude to physiotherapists Fiona Genney and Suzanne Offer of Raigmore Hospital Inverness for providing me with an invaluable practice based learning experience which inspired me to write the current article.

### **REFERENCE LIST**

Babyar SR, Peterson MGE, Bohannon R, Pérennou D and Reding M (2009) *Clinical examination tools for lateropulsion or pusher syndrome following stroke: a systematic review of the literature* Clinical Rehabilitation (23) pp639–650.

Baccini M, Paci M, Nannetti L, Biricolti C and Rinaldi LA (2008) Scale for Contraversive Pushing: Cutoff scores for diagnosing 'Pusher Behaviour' and construct validity Physical Therapy 8 (88) pp947–955.

Broetz D, Johannsen L and Karnath HO (2004) *Time course of 'pusher syndrome' under visual feedback treatment* Physiotherapy Research International 9 (3) pp138–143.

Davies PM (1985) *Steps to Follow: A Guide to the Treatment of Adult Hemiplegia* (Springer, New York).

Dietz V, Gollhofer A, Kleiber M and Trippel M (1992) *Regulation of bipedal stance: dependency on load receptors* Experim Brain Res (89) pp229–231. Karnath H0 (2007) Pusher syndrome – a frequent but littleknown disturbance of body orientation perception Journal of Neurology (254) pp414-424.

Karnath HO and Broetz D (2003) Understanding and treating 'pusher syndrome' Physical Therapy (83) pp 1119–1125.

Karnath HO, Ferber S and Dichgans J (2000) *The origin of contraversive pushing: evidence for a second graviceptive system in humans.*' Neurology, (55), pp 1298–1304.

Karnath H0, Ferber S and Dichgans J (2000) The neural representation of postural control in humans Neurology 25 (97) pp13931–13936.

Karnath HO, Johannsen L, Broetz D, Ferber S and Dichgans J (2002) *Prognosis of contraversive pushing* Journal of Neurology (249) pp1250–1253.

Karnath HO, Johannsen L, Broetz D and Kuker W (2005) Posterior thalamic hemorrhage induces 'pusher syndrome' Neurology (64) pp1014-1019. Paci M, Baccini M and Rinaldi L (2009) *Pusher behaviour: A critical review of controversial issues* Disability and Rehabilitation 31 (4) pp249–258.

Panturin E (2004) *Pusher syndrome* [Letter to the Editor] Physical Therapy (84) pp580-583. Pederson PM, Wandel A, Jorgenson HS, Nakayama H, Raaschou HO and Olsen TS (1996) *Ipsilateral pushing in stroke: Incidence, relation to neuropsychological symptoms, and impact upon rehabilitation. The Copenhagen Stroke Study* Arch Phys Med Rehabil pp25–28. Pérennou DA, Amblard B, Leblond C and Pélissier J (1998) *Biased postural vertical in humans with hemispheric cerebral lesions* Neurosci Lett (252) pp75-78.

Saj A, Honore J, Coello Y and Rousseux M (2005) *The visual vertical in the pusher syndrome*: Influence of hemispace and body position Journal of Neurology (252) pp885-891.

Trueland J (2009) *Seeing is believing* [Online] Available at: http://www.csp.org.uk/frontline/ article/seeing-believing [Accessed 26/01/2012].

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# Lecture abstracts

# Plasticity in neurorehabilitation:

some unanswered questions

### John C Rothwell

Professor of Human Neurophysiology, UCL Institute of Neurology, Queen Square, London, UK

There is now reasonable evidence that at least some of the recovery of function following damage to the CNS or even the periphery, is due to reorganisation of neural connections in the brain. It is thought that rehabilitation therapy harnesses these processes, allowing the CNS to achieve optimal output from a damaged system. New brain stimulation protocols such as transcranial magnetic stimulation or transcranial direct current stimulation are presently being tested to improve recovery, usually with the rationale that application of 'plasticity modifying' interventions before or during therapy will enhance the overall response. Effectively the reasoning is to try to improve or speed natural processes of reorganisation. However, although this type of model is attractive and based on a steadily increasing body of evidence, there are still a number of questions that need to be addressed in future investigations, for example:

- 1 Is there any formal evidence that behavioural learning is improved by these interventions in clinical populations? Or could improved outcomes actually be the result of completely different mechanisms?
- **2** How well will enhanced functions generalise to untrained movement? Will brain stimulation therapy make newly learned function more fixed and less adaptable?
- **3** How well are gains within each session of training consolidated for future use?

Are there ways in which this can be improved?

**4** Finally, if brain stimulation interventions work by enhancing natural processes of behavioural learning, will standard therapy reach the same performance plateau if applied for a sufficiently long period of time?

### John C Rothwell

After receiving a PhD from the University of London, UK, in 1980, John Rothwell worked in London as a Roval Society University Research Fellow in the Neurology Department of Professor CD Marsden at the Institute of Psychiatry until 1988, before moving as a senior scientist to the Medical Research Council Human Movement and Balance Unit at the Institute of Neurology. In that period he developed his interest in the pathophysiology of human movement disorders, with particular attention to Parkinson's Disease, dystonia and myoclonus. The 1980s were times of great expansion in the new technique of transcranial magnetic stimulation, which he and others developed for the study of the human cortical motor system. He became acting director of the MRC Unit in 1998 before being appointed to be head of the Sobell Department of Motor Neuroscience and Movement Disorders at UCL Institute of Neurology in London and was elected a Fellow of the Academy of Medical Sciences in 1994. He is currently Professor of Human Neurophysiology at UCL Institute of Neurology. Current research projects include using neurophysiological techniques to study the mechanisms of neural plasticity that underpin motor learning, and using this knowledge to devise new therapeutic interventions for rehabilitation after stroke

# Physiotherapy management of people with spinal cord injuries:

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the essentials

### Lisa Harvey

Associate Professor, Rehabilitation Studies Unit, Northern Clinical School, Sydney Medical School, University of Sydney, Sydney, Australia

The primary aim of physiotherapy for people with spinal cord injuries (SCI) is to help individuals attain optimal levels of independence with mobility and activities of daily living. There are five steps involved in planning and implementing an appropriate physiotherapy programme

regardless of a patient's stage of rehabilitation.<sup>1</sup> They are: assessing impairments, activity limitations and participation restrictions; setting goals; identifying key problems amenable to physiotherapy; administering treatments and measuring outcomes. Often the most difficult step for physiotherapists not familiar with SCI is setting goals. This is difficult because it requires an understanding of what patients can be expected to achieve. This of course varies, depending on a number of factors, but most importantly depending on neurological status. Identifying key problems amenable to physiotherapy can also be a challenging step for physiotherapists inexperienced in SCI. It requires an understanding of the evidence base for different therapeutic approaches. The best evidence about appropriate treatments comes from randomised controlled trials and systematic reviews. We are still in the early stages of building high-quality evidence but there is reasonable evidence to support the use of physiotherapy to treat six key impairments.<sup>2</sup> These are: lack of strength; lack of dexterity and skill; poor respiratory function; limited cardiovascular fitness; restricted range of motion and pain. There is also emerging evidence to support new and novel therapeutic approaches which include the use of robotics. However, as we move forwards it will be important to ascertain the costeffectiveness of new interventions before advocating for their widespread rollout to the public.3

### References

- 1 Harvey L (2008) Management of spinal cord injuries: a guide for physiotherapists London: Elsevier.
- 2 Harvey L, Lin CM, Glinsky J, De Wolf A (2009) The effectiveness of physical interventions for people with spinal cord injuries: a systematic review Spinal Cord 47 pp184-195.
- 3 Harvey L, Wyndaele JJ (2011) Are we jumping too early with locomotor training programs? Spinal Cord 49 p947.

### Lisa Harvey

Lisa has 25 years clinical and research experience in the area of spinal cord injuries. She is currently Associate Professor at Sydney School of Medicine, University of Sydney and has a conjoint appointment at the Moorong Spinal Unit, Royal Rehabilitation Centre Sydney. She has over 70 publications on a diverse range of topics including contracture and hand management, gait along with exercise and respiratory physiology. She primarily focuses on clinical trials designed to determine the effectiveness of different physiotherapy interventions for people with spinal cord iniury and other neurological conditions. Lisa teaches widely both nationally and internationally, and is very involved in assisting with the further development of physiotherapy services for people with spinal cord injuries throughout the lessresourced countries of Asia. She initiated and continues to manage a website of physiotherapy exercises appropriate for people with neurological conditions (www.physiotherapyexercises.com). In addition, she has sole authored a comprehensive text book on physiotherapy management of spinal cord injuries and is currently coordinating a large international initiative to develop freely available online learning modules in spinal cord injuries for physiotherapy students and junior clinicians. Lisa sits on the editorial boards of Spinal Cord, Journal of Physiotherapy and the Journal of Neurologic Physical Therapy and is chairperson of the International Network of Spinal Cord Injury Physiotherapists (www.scipt.org).

### "Stop blubbing and get to work" neurophysiotherapy – a

consumer's viewpoint

### Melanie Reid

Journalist for The Times

A personal insight into the experience of rehabilitation from a serious spinal injury; the discovery that my injury was not complete, as was first thought; and my subsequent fight to regain some function aided by spinal physiotherapists. I will talk about the importance of having a good relationship with one's physiotherapist; about the huge impact the Locomat had on my rehabilitation; about mental resilience; and about my maddeningly slow progress from Asia A to knocking on the door of Asia D.

#### **Melanie Reid**

Melanie Reid, 54, was born in London and studied English at Edinburgh University. An award-winning journalist for more than 30 years, she held senior editorial posts on the Scotsman, the Sunday Mail and the Glasgow Herald and for the last five years has been a columnist for The Times. In 2010 she fell off her horse at a jump and broke her neck at C6 and fractured T12. Since then she has charted her life in Spinal Column in The Times' Saturday magazine.

# Washed up and worn out? Implementing evidence based practice in the current financial climate

### **Michelle Price**

Consultant therapist for stroke and neurorehabilitation, Powys Teaching Health Board, Brynheulog Rehabilitation Unit, Newtown Hospital, Powys, Wales

Driving forward improvements in physiotherapy services and implementing evidence based practice is hard in the current financial climate. Efforts to constantly improve clinical services can leave physios feeling washed up and worn out. This presentation explores how the attributes of neurophysiotherapists can help them be instrumental in developing effective and efficient services and gives some practical tips on how to achieve small changes that improve the quality of patient care even in the most rural setting.

### **Michelle Price**

Michelle graduated from Bath School of Physiotherapy in 1992. She has specialised in neurosciences since 1996. She moved to Wales in 1999. She has worked in a wide variety of clinical roles across south Wales in acute, rehabilitation and community settings. She completed an MSc in Physiotherapy at Cardiff University in 2006. She completed the Gateway to Lead Programme delivered by the National Leadership and Innovation Agency for Healthcare (NLIAH) in 2008. She was the programme manager for the All Wales Stroke Service Improvement Collaborative (AWSSIC) between 2008 and 2011 initially as part of the Stroke Service Improvement Programme and then as mini-collaboratives as part as 1000 Lives Plus. This involved supporting the development and implementation of care bundles for acute stroke, early stroke rehabilitation and TIA services. She started her role as Consultant Therapist for Stroke and Neurorehabilitation in Powys in December 2010, becoming full time in April 2011.

# The effect of temperature on neuromuscular function in health and neurological disease

### Jon Marsden

Professor of Rehabilitation, School of Health Professions, Faculty of Health, Education and Society Plymouth University UK

Changes in temperature have several physiological effects in healthy participants with cooling and warming having opposite effects. Cooling a limb leads to a reduction in motor and sensory nerve conduction velocity, maximal voluntary strength and the rate of force generation. These changes are in part mediated by alterations in voltage-gated ion channel dynamics and a reduction in Na+/K+ ATPase activity that are vital for regenerative nerve and muscle action potentials. Limb cooling may also increase muscle stiffness and viscosity and reduce muscle thixotropy. A comparison of tendon and H reflexes further suggests that cooling can affect muscle spindle activity resulting in a decrease in stretch reflex size.

The effect of temperature on people with neurological deficits varies depending on the underlying pathology. In the presence of peripheral or central nerve demyelination an increase in temperature can cause conduction block. This may underlie Uhthoff's phenomema in people with multiple sclerosis, where symptoms worsen with an increase in core temperature as occurs with exercise.

Cooling has been used to manage various symptoms in people with neurological disease. Studies of the effects of cooling on spasticity are variable but cooling does consistently reduce tremor associated with cerebellar disease, essential tremor or dystonia. Localised warming may enhance reductions in limb stiffness with stretching and recent work in people with hereditary spastic paraparesis suggests that it can lead to increases in strength, rate of force generation and walking ability. In people with long term neurological conditions, autonomic nervous system dysfunction and/or vascular changes secondary to limb disuse may affect the vascular response to a change in temperature. This may further impact on temperature-related changes to the neuromuscular system.

#### Jon Marsden

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.

# Parkinson's physiotherapy audit 2011: preliminary results

### Fiona Lindop

Specialist Physiotherapist, Derby Parkinson's Disease Service, Derbyshire Royal Infirmary, Derby UK

The first physiotherapy audit of the NICE Guidelines for Parkinson's Disease was carried out between July and November 2011 with the aim of evaluating whether services are providing assessment and interventions appropriate to the needs of people with Parkinson's, taking into account both the NICE and NSF for Long Term Conditions recommendations. The audit also looked at whether physiotherapists were aware of the UK Quick reference Cards which provide standardised guidance for physiotherapists working with people with Parkinson's. I will present the preliminary findings and the implications of these results.

#### **Fiona Lindop**

Fiona Lindop is a specialist physiotherapist in Parkinson's Disease and related conditions, working as part of a multi-disciplinary team in Derby who have been awarded 'Centre of Excellence' status from the American National Parkinson Foundation. Since qualifying in Aberdeen she has worked in London, Hertfordshire, Yorkshire and Derbyshire. She

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has developed a physiotherapy-specific assessment tool for Parkinson's Disease (The Lindop Parkinson's Disease Assessment Scale-LPAS) and was a cowriter of the physiotherapy section of the Parkinson's UK Guide for Professionals. Fiona is vicechair of the Association of Physiotherapists in Parkinson's Disease Europe (APPDE) and is currently representing physiotherapy on the committee for the national audit of the NICE guidelines for Parkinson's Disease.

# Vestibular rehabilitation:

the true backbone of neurology

### Anne Rodger

Clinical specialist, National Hospital for Neurology and Neurosurgery, London, UK

Dizziness is very common (one in five visits to GPs are for dizziness). This can commonly be caused by dysfunction within the peripheral vestibular system, for which physiotherapy has a huge role in the assessment and successful treatment.Neurologically impaired people often present with vestibular dysfunction. This could be viewed as being a central disorder, but it could equally be of peripheral origin. Being able to assess appropriately is as ever the key to treatment success. A knowledge of vestibular rehabilitation is essential to any physiotherapist involved in treating people with balance dysfunction.

### Anne Rodger

Anne qualified as a physiotherapist in 1990 and has since worked in Brighton, Addenbrookes, The Royal Free and most recently at the National Hospital for Neurology and Neurosurgery where she has been a clinical specialist for the last 10 years. She completed an MSc in Neurorehabilitation at Brunel University in 2003. At the NHNN, she treats a mixture of vestibular and neurologically impaired patients. She helped set up the Vestibular Special Interest Group (ACPIVR) and was the chair from 2005 to 2011.

# Information technology:

how can we use it to progress physiotherapy and better communicate around the world?

### Lisa Harvey

Associate Professor, Rehabilitation Studies Unit, Northern Clinical School, Sydney Medical School, University of Sydney, Sydney, Australia

Information technology provides a rich opportunity to progress and globalise physiotherapy. For example, physiotherapists from around the world can now communicate and share ideas through social media forums; teachers can put their educational material online for all to see; clinicians can share exercise ideas and treatment videos through sophisticated internet-based software: patients can access guidance and help from physiotherapists in the comfort of their homes. In addition, information technology is helping to bridge the gap between physiotherapists around the world. For example, online learning packages are helping to upskill physiotherapists from low resource countries where access to high quality physiotherapy-specific education can sometimes be limited. While all these uses of information technology are to be welcomed they raise some interesting issues. These include issues around patient privacy, intellectual property, liability, funding and copyright. They also include issues related to the potential misuse of material and the blurring of lines between physiotherapists' professional and personal lives. We are yet to work our way through the complexities associated with advances in information technology but regardless, the next ten years will see information technology change the face of physiotherapy across the globe.

### Lisa Harvey

Lisa has 25 years clinical and research experience in the area of spinal cord injuries. She is currently Associate Professor at Sydney School of Medicine, University of Sydney and has a conjoint appointment at the Moorong Spinal Unit, Royal Rehabilitation

Centre Sydney. She has over 70 publications on a diverse range of topics including contracture and hand management, gait along with exercise and respiratory physiology. She primarily focuses on clinical trials designed to determine the effectiveness of different physiotherapy interventions for people with spinal cord injury and other neurological conditions. Lisa teaches widely both nationally and internationally, and is very involved in assisting with the further development of physiotherapy services for people with spinal cord injuries throughout the lessresourced countries of Asia. She initiated and continues to manage a website of physiotherapy exercises appropriate for people with neurological conditions (www.physiotherapyexercises.com). In addition, she has sole authored a comprehensive text book on physiotherapy management of spinal cord injuries and is currently coordinating a large international initiative to develop freely available online learning modules in spinal cord injuries for physiotherapy students and junior clinicians. Lisa sits on the editorial boards of Spinal Cord, Journal of Physiotherapy and the Journal of Neurologic Physical Therapy and is chairperson of the International Network of Spinal Cord Injury Physiotherapists (www.scipt.org).

# Stretch for the treatment and prevention of contractures:

what does the evidence say?

### Lisa Harvey<sup>1</sup>, Owen Katalinic<sup>2</sup> and Robert D Herbert<sup>3</sup>

1 Associate Professor, Rehabilitation Studies Unit, Northern Clinical School, Sydney Medical School, The University of Sydney, Australia. 2 Physiotherapist, Rehabilitation Studies Unit, Northern Clinical School, Sydney Medical School, The University of Sydney, Australia. 3 Associate Professor, Musculoskeletal Division, The George Institute for Global Health, The University of Sydney, Australia.

Stretch is widely used for the treatment and prevention of contractures but little is known about its effectiveness. A Cochrane Systematic Review was undertaken.<sup>1, 2</sup> All randomised controlled trials of stretch interventions (sustained passive stretching, positioning, splinting and serial casting) applied for the purpose of treating or preventing contractures were considered for inclusion. Two reviewers independently selected trials, extracted data, and assessed risk of bias. Pooled estimates were obtained using a random-effects model. 35 trials with 1,391 participants met the inclusion criterion. 25 trials investigated the effect of stretch in people with neurological conditions. In these people, stretch increased joint range of motion by 3° (95% CI, 0 to 5) in the immediate term (<24 hours after last stretch), by 1° (95% CI, 0 to 3) in the short term (<1 week after last stretch) and by 0° (95% CI, -2 to 2) in the long term (>-1 week after last stretch) when compared with no treatment or usual care. The results were similar for people with non-neurological conditions. The results of this review do not support the use of stretch interventions administered for less than six months for the treatment or prevention of contractures. These results are challenging for the physiotherapy profession because they require the reappraisal of an intervention which we have long believed to be effective. Contractures are a complex problem and can not be readily treated or prevented by stretch alone. We are yet to identify an effective treatment strategy but it may involve a multi-pronged approach including a package of modalities such as electrical stimulation, motor training, botulinum toxin and stretch.

#### References

1 Katalinic OM, Harvey LA, Herbert RD, Moseley AN, Lannin NA, Schurr K (2010) Stretch for the treatment and prevention of contractures The Cochrane Database of Systematic Reviews Issue 9 Art No: CD007455. DOI:

10.1002/14651858.CD007455.pub2.

2 Katalinic OM, Harvey LA, Herbert RD (2011) Effectiveness of stretch for the treatment and prevention of contractures in people with neurological conditions: a systematic review Physical Therapy 91 pp11-24.

#### Lisa Harvev

See previous.

#### **Owen Katalinic**

### Physiotherapist, Rehabilitation Studies Unit, Northern Clinical School, Sydney Medical School, The University of Sydney, Australia

Owen is a physiotherapist working part-time as a project officer on the freely accessible physiotherapy exercise website: www.physiotherapyexercises.com. The website contains exercises appropriate for people with neurological disabilities and has recently received funding from the NSW Department of Ageing, Disability and Home Care to add 200 additional paediatric exercises.

#### Robert D Herbert

### Associate Professor, Musculoskeletal Division, The George Institute for Global Health, The University of Sydney, Australia

Robert is a senior research fellow at The George Institute, associate professor in the Faculty of Medicine at the university, and senior honorary research associate at the Prince of Wales Medical Research Institute. Rob's primary interest is in the effectiveness of physiotherapy interventions, particularly stretch-based interventions for prevention and treatment of contracture. He also conducts complementary research into the passive mechanical properties of human muscles and tendons.

# What is the cause of balance impairment in patients with cerebellar disease?

### Lisa Bunn

Post-doctoral research fellow and physiotherapy lecturer, School of Health Professions, Faculty of Health, Education and Society, Plymouth University, UK

Balance impairment is a common feature of cerebellar disease. This affects a variety of long term neurological conditions involving cerebellar pathology but the cause of balance impairment remains unknown. In order to begin to understand the effect of cerebellar pathology on balance this program of study explores sensory processing for balance control in persons with pure cerebellar lesions. SCA6 provides a good human model of pure cerebellar disease; cerebellar atrophy is principally caused by Purkinje cell death, the condition can be genetically diagnosed with a blood sample and balance impairment is commonly the presenting symptom on initial diagnosis<sup>1</sup>. Advantageously, a validated measure of disease severity for those with SCA6 (the scale for assessment and rating of ataxia) is also available in order to explore associations with measures of balance impairment<sup>2</sup>.

Laboratory-based recordings of 3D whole body motion as balance measures were initially collected whilst subjects were positioned in five different stance widths (0,4,8,16 and 32cm between medial calcanei). Once SCA6 measures were compared against those of the healthy control group, the extent of balance impairment and distribution of whole body instability was better understood for those with pure cerebellar disease. Laboratory driven means of perturbing balance via manipulation of isolated sensory afferent signals were then used to explore sensory control mechanisms of balance. Balance responses to visual stimuli were particularly elevated in magnitude compared to healthy controls and response magnitudes correlated strongly with disease severity scores<sup>3</sup>. A newly designed novel home-based therapy was then trialled and feasibility of use established. Although underpowered (due to an initial focus on feasibility), early outcome measures suggest potential for effectiveness of the intervention in terms of impairment, function and participation. A fully powered randomised controlled trial of the therapy is now needed.

Guidelines for the management of ataxia are currently lacking in the quantity and scientific rigour of supporting evidence base<sup>4</sup>. This program of study provides one significant contribution to future development of guidelines concerning management of balance impairment in cerebellar ataxia.

#### References

- 1 Giunti & Wood (2007) The inherited ataxias ACNR 7 (5) pp18-21.
- 2 Schmitz-Hübsch et al (2006) Scale for the assessment and rating of ataxia. Neurology66 (11) pp1717-1720.
- 3 Bunn L (2010) Sensory mechanisms of balance control in pure cerebellar disease Doctoral thesis, UCL (University College London) http://discovery.ucl.ac.uk/1306178/
- 4 Marsden J, Harris C (2011) Cerebellar ataxia: pathophysiology and rehabilitation Clinical Rehabilitation 25 (3) pp195-216.

#### Lisa Bunn

Lisa Bunn worked as a physiotherapist at Stoke Mandeville Hospital and North Bristol NHS Trust prior to embarking on a career as a researcher and lecturer. In 2006 she undertook a PhD with University College London investigating balance impairment in persons with cerebellar ataxia. PhD work, based in the Institute of Neurology and the Specialist Ataxia Centre, focussed in on patients with pure types of cerebellar disease. One aim was to establish a baseline from which effects of additional extra-cerebellar pathologies can later be compared against. PhD work led directly onto the development of a novel therapy targeting ocular control of balance and a feasibility study evaluating home-based delivery of this study was conducted in 2010. Post-doctoral research has continued to focus on neuro-rehabilitation; specifically on improving an understanding of patho-physiological mechanisms with the aim to target future therapies. Now employed at Plymouth University, Lisa is working on projects consistent with this aim. Lisa is currently working a split role between post-doctoral research, undergraduate and post-graduate lecturing duties within the School of Health Professions at Plymouth University.

# Taking the patient to the next level: high

intensity exercise in neurological rehabilitation

### **Bernhard Haas**

Associate Professor in Physiotherapy and Deputy Head of the School of Health Professions at Plymouth University, UK

The health related benefits of exercise in the general population are well documented. Individuals following neurological insult are severely tested to achieve recommended quantities of activity and exercise and their lack of exercise increases the risk for cardiovascular disease further. This presentation challenges rehabilitation professionals to support their patients to overcome barriers to exercise participation. The evidence for incorporating cardiovascular and strengthening exercises into neurological rehabilitation is now firmly established. Exercise training therefore should be the backbone of neurological rehabilitation. High intensity exercise trials have recently shown promise in improving fitness, strength as well as function still further and have the potential to raise the rehabilitation outcomes of patients in a numbers of conditions. The intensity aspect of the frequency, intensity, type and time (FITT) exercise prescription principles therefore should receive a stronger focus in treatment planning.

### Bernhard Haas

At Plymouth Bernhard has specific responsibility for all matters relating to learning and teaching of the

seven health professions in the School (dietetics, occupational therapy, operating department practice, optometry, paramedicine, physiotherapy and podiatry). Bernhard qualified as a physiotherapist in 1984 in West Berlin. He moved to the UK in 1984, working in hospitals and trusts in Oxford and Buckinghamshire. It was at the National Spinal Injuries Centre at Stoke Mandeville where he developed his expertise in rehabilitation and patient management. He left full time work in the NHS in 1992 to take up his first teaching post at the University of Brighton. Bernhard joined Plymouth in 2003 in order to design the new physiotherapy programme and taking it to its initial approval and validation. His research interests are in the area of neurological rehabilitation, specifically related to activity, exercise and function in conditions such as Parkinson's Disease and spinal cord injury.

# Workshop sessions

### **OPTION 1**

What is going on down under in spinal cord injuries: clinical driven research and research driven practice

### Lisa Harvey

Associate Professor, Rehabilitation Studies Unit, Northern Clinical School, Sydney Medical School, University of Sydney, Sydney, Australia

The primary aim of this workshop is to provide an informal opportunity for delegates to discuss barriers and opportunities for driving and practicing evidence-based practice in the clinic. While the focus will be on spinal cord injuries, the broad principles will be equally relevant to all areas of neurology. The presenter will provide some short examples of the model used in Australia to bridge the gap between researchers and clinicians. There will also be an opportunity to discuss recent advances in physiotherapy management of people with spinal cord injuries and the current push away from teaching compensatory strategies and push towards focusing on the potential for recovery

below the level of the lesion. The expectations of the media, neuroscientists and consumers for people with spinal cord injury to recover and walk following spinal cord injury and influence of these expectations on the way physiotherapy is being increasingly marketed and provided around the world will also be discussed.

# OPTION 2

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How to write a case study

### Gita Ramdharry

Senior Lecturer, Faculty of Health and Social Care Sciences, St George's University of London/Kingston University

This session will outline case reports, their contribution and what to write about. Using examples and exercises, attendees will be given the opportunity to start thinking about and planning a report on a case of interest.

# **OPTION 3** Independent practice – is it for you?

### Sally de la Fontaine

Milestones Clinic, Egham, Surrey

Is there a need for a support network? A unique opportunity to discuss these questions with a panel of experienced neurophysiotherapists all of whom work, in varying ways, within private practice.

### **OPTION 4**

Company presentations



### **Bioness Inc**

Bioness offers award winning wireless functional electrical stimulation (FES) systems – the NESS H200 Hand Rehabilitation System, the NESS L300 Foot Drop System and the highly innovative NESS L300 Plus Thigh Simulation System. The devices offer real therapy solutions both during treatment sessions or for home use. Bioness technologies can improve hand function and walking and so independence and quality of life, as well as improving ROM, muscle strength and local circulation and reducing muscle tone. With high technology that is easy to use, the systems can be used at any stage during the recovery process.



### Saebo UK

Saebo UK are an orthotic distributor and training company specialising in

neurological rehabilitation. In addition to our SaeboReach, SaeboFlex and SaeboStretch we have now launched our new Saebo Mobile Arm Support which we are demonstrating at the ACPIN conference. To find out more about our Free Assessment Sites, product range and training please contact us at ukinfo@saebo.com



### **Cyclone Technologies**

Cyclone Technologies is a leading UK manufacturer of custom wheelchairs, providers of functional

electrical stimulation products, spinal injury therapy equipment, The ReWalk and more.

# Speed updates What does ACPIN do?

### **UPDATE 1** Splinting guidelines

### Jo Tuckey

Private Practitioner, co-chair of national ACPIN 2008 -2010, ACPIN representative for development of splinting guidelines

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ACPIN in conjunction with the College of Occupational Therapists specialist section neurological practice (COT SSNP) have finalised a contract to produce neurological splinting practice guidelines.

The work is being joint funded by ACPIN and COT SSNP and being carried out at Brunel University London under the direction of Dr Cherry Kilbride and Prof Lorraine De Souza.

The need for splinting guidelines and current practice was established by a joint survey carried out in 2009/10. It was completed by 420 therapists, one third were physiotherapists and all responses indicated a need for better guidelines. The results of this survey are due for publication.

The work has commenced with the literature review; it is envisaged that the guidelines will be completed by 2013. There will be a call to be involved in a Delphi Method later this year. Expressions of interest should be sent to jotuckey@aol.com.

This will be the first published joint physiotherapy and OT guideline to be undertaken.

### **UPDATE 2**

International Neurological Physical Therapy Association (INPA)

### **Cherry Kilbride**

Physiotherapy lecturer, Brunel University, UK, co-Chair of national ACPIN 2008-2010, ACPIN representative on INPA

INPA was formerly recognised at a subgroup of the World Confederation for Physical Therapy (WCPT) last year in Amsterdam at the 16th World Physical Therapy Congress.

INPA represents national groups of physical therapists with a special interest in neurology and neuroscience. INPA is committed to promoting and facilitating excellence in neurological physical therapy in clinical practice, research and education.

For more information about the INPA, please consult the Association web page at: **www.wcpt.org/INPA** and join forum discussion at the WCPT Neurology Forum at: **www.wcpt.org/smfforu** 

### **UPDATE 3**

Intercollegiate Stroke Working Party (ICSWP) Royal College of Physicians London

### Cherry Kilbride

See previous

The Stroke Programme at the RCP began in 1996 and ACPIN has had a constant representation since. The work of the Stroke Programme is led by the Intercollegiate Stroke Working Party, made up of representatives from all the professional bodies involved in stroke care including the voluntary sector and patient representation. The purpose is to set evidence based standards, measure compliance in the organisation and delivery of stroke care and encourage service improvement. ACPIN members will be familiar with the Sentinel Stroke National Audit Programme and the National Clinical Guideline for Stroke. Nicola Hancock (past Chair of ACPIN) is our representative on ICSWP.

# **UPDATE 4** Behind the scenes for Parkinson's

### Bhanu Ramaswamy

Independent Physiotherapy Consultant

Fiona Lindop and I currently represent the CSP, ACPIN and AGILE on several projects relating to physiotherapy and Parkinson's. During this session, I will summarise the work we have completed recently, and are involved with at the moment, for and with the Professional Networks that further the profession and standards of clinical practice for physiotherapists working with people with this condition.

# **UPDATE 5** UK Stroke Forum (UKSF)

### **Fiona Jones**

Reader in Rehabilitation, School of Rehabilitation Science, Faculty of Health and Social Care Sciences, St George's University, London, and Kingston University. Fiona currently represents ACPIN on the UK Stroke forum steering committee and scientific committee

In December 2011, the UK Stroke forum held another successful conference in Glasgow. Against gloomy estimates of reducing numbers, more delegates have attended this conference year on year since 2006. ACPIN is represented on both the UK Stroke Forum steering committee and the Scientific Committee. We make sure our voice is heard, working together with colleagues from the special section of neurologcial OTs and the Society for Research In Rehabilitation. The aim is to ensure that rehabilitation is fully represented as a topic within the programme, and promote the role of ACPIN and physiotherapy for people with stroke. This has not always been easy! Fiona Jones will present a short overview of her role on the UK Stroke Forum committees, and ideas for how ACPIN can gain greater recognition and respect within these groups.

# Posters

### Winners' presentation abstracts



### **WINNER ONE**

### **Katherine Stone**

Consultant Therapist in Neurology, PCH, Cornwall.

# Development of a new clinical audit tool for splinting in neurology

'Splints and casts are external devices designed to apply, distribute or remove forces to or from the body in a controlled manner to perform one or both basic functions of control of body motion and alteration or prevention in shape of body tissue.' ACPIN 1998

**Aim**: The aim of developing a new splinting audit tool is to inform delivery of best clinical care for adults who require splints following acquired or progressive neurological dysfunction.

**Objective**: To evaluate the reliability and validity of the new splinting audit tool in clinical practice. The audit tool was developed from the standards in the *National Clinical Guidelines for Splinting Adults with Neurological Dysfunction* ACPIN 1998.

**Method**: A simple questionnaire identified five clinical areas that provided splints for this population. Physiotherapists and occupational therapists in each area were identified as raters to use the audit tool. The audit tool grouped the standards from the guidelines into twenty five standards within six key topics. Each set of clinical notes was double audited.

**Results**: One area was unable to complete the audit resulting in four areas completing the double audit on twenty sets of notes. An interrater reliability analysis using the Kappa statistic was performed to determine consistency among raters. Measurement of the agreement between the raters of the categorised variables was found to have substantial agreement (0.61-0.80) in three of the four areas and almost perfect agreement in one area (0.849) see *Table of Aagreement*.

Карра	Interpretation
<0	Poor agreement
0.00 - 0.20	Slight agreement
0.21 - 0.40	Fair agreement
0.41 - 0.60	Moderate agreement
0.61 - 0.80	Substantial agreement
0.81 - 1.00	Almost perfect agreement
T-616	(Landis & Kash 1077)

Table of agreement (Landis & Koch 1977)

**Conclusion**: This new audit tool has been found to be both reliable and valid as a measure of the standards of practice used in neurological splinting. Further work to ensure validity can be explored in a larger study. The existing guidelines are to be revised this year to allow for new evidence to be incorporated into the recommendations. The audit tool can be further refined and evaluated to ensure it is still valid as well as reliable.

### **Splinting Pathway**

### 1 Clinical indication for splinting

- Goal & aims of splinting are identified
- Alternatives are considered
- Contraindications and cautions are identified
- Clinical rationale to proceed is documented

### 2 Consent

- Patient and carer are fully informed with written/relevant information
- Verbal consent is documented
- Relevant health and social care professionals are informed

### 3 Assessment

- Standardised assessment proforma is used
- Aims are identified and agreed within a management plan
- Outcomes are identified as appropriate, valid and relevant
- Photograph record is taken (adhering to Trust policy)

### 4 Application

- Splint materials follow specific manufacturer's guidelines
- Choice of splint material is documented
- Splint regime is recorded

### 5 Monitoring

- Written information on splint use and care is provided to patient and carer
- Method of monitoring is established
- Plan for re-assessment is documented

### 6 Evaluation

- Evaluation of the outcome is documented
- Decision to re-apply or discontinue use of splint is documented

### Clinical Audit Tool for Splinting in Neurology

Management of neurological dysfunction with splinting: tool for audit of service provision.

Clini	cal Indication for splinting	
1	Goal of splinting is identified	Yes / No
2	Aim(s) of splinting are clearly identified	Yes / No
3	Alternatives have been considered	Yes / No
Cont	raindications and precautions	
4	Cautions are identified and clinical rationale to proceed is documented	Yes / No
Cons	ent	
5	MDT decision to splint is identified (Inpatient)	Yes / No
	Outpatient	N/A
6	GP/other health care professionals involved in care informed (outpatient)	Yes / No
	Inpatient	N/A
7	Family member/carer is involved in discussion for feasibility	Yes / No
8	Patient is fully informed with written information	Yes / No
9	Verbal consent is documented	Yes / No
10	Written consent documented (non-removable splint)	Yes / No
	Removable splint	N/A
Asse	ssment	
11	Standardised splinting assessment used	Yes / No
12	Aim(s) are clearly agreed and identified within the management plan	Yes / No
13	Outcome measure is appropriate and valid	Yes / No
14	Outcome measure is relevant to the goal(s)	Yes / No
15	Photograph record available (adhering to Trust protocol)	Yes / No
Appl	ication	
16	Splint materials are stored and used following specific manufacturers guidelines	Yes / No
17	Choice of material is documented	Yes / No
18	Position (lying/seated) during application is documented	Yes / No
19	Splinting regime is recorded	Yes / No
Mon	itoring	
20	Written information on use and care of splint is provided to patient and carer	Yes / No
21	Method of monitoring is established (skin integrity, pain, swelling etc)	Yes / No
22	Protocol for emergency removal of splint is established (non-removable splint)	Yes / No
23	Plan for re-assessment is documented	Yes / No
24	Objective measure is documented at re-assessment	Yes / No
25	Decision to re-apply or discontinue splint use is documented	Yes / No

### WINNER TWO

### Jodi Ofori

The effect of applied torque and stretch duration on range of movement, passive stiffness and spasticity in people with multiple sclerosis.

### AUTHORS

### Ofori J<sup>1</sup>; Freeman J<sup>1</sup>; Bugman G<sup>2</sup>, GibbonsP<sup>2</sup>, Zajicek J<sup>3</sup>, Hobart J<sup>3</sup>, Marsden J<sup>1</sup>

1 School of Health Professions, Plymouth University 2 School of Computing and Mathematics, Plymouth University

3 Peninsula College of Medicine and Dentistry, Plymouth University

**Purpose**: To determine the effect of stretch duration and applied torque on peri- and post stretch changes in plantarflexor passive stiffness, stretch reflex excitability and ankle range of motion in people with multiple sclerosis (pwMS).

**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. However, the current evidence base for stretching is variable and there is a paucity of literature regarding the stretch-related parameters that effectively reduce stiffness.

**Participants**: Participants with clinically defined MS (n=27; age 58 ± 10 yrs), with a median EDSS 6.0 (range 4.5-7.0) who self-reported leg stiffness.

Methods: The application of a constant torque stretch using three different torque values [high (0.42Nm/Kg), medium (0.30 Nm/Kg) and low (0.18 Nm/Kg)] over either 30 minutes or 10 minutes was investigated. For both stretch durations participants were seen on three occasions separated by a minimum of three days. The order of the applied torque was randomised. Ankle stiffness (↑torque/↓position) was measured immediately before and after stretching and at ten minute intervals post-stretch over a 30 minute period. Slow (50/second {s}) and fast stretches (1700/s) of the plantarflexors using a customised motor were used to quantify the degree of passive stiffness and stretch reflex activity respectively. ROM was monitored throughout the course of the experiment.

**Analysis:** The effect of applied torque on passive stiffness, stretch reflex activity and ROM, were compared using a repeated measures analysis of variance (ANOVA).For all statistical tests, the level of significance was set at P<0.05.

**Results**: Constant torque stretches applied for 10- 30 minutes significantly improved ankle range of movement in pwMS; this was more pronounced when higher forces were applied (P<0.001).

Passive stiffness decreased with stretching although this was not affected by the size of the applied torque (P>0.05).Following a 30 minute stretch passive stiffness decreased on average by 27% ( $\pm$ 19%, P<0.05) and subsequently increased by 7% in the 30 minutes post stretch period. In contrast, 10 minutes of stretching resulted in a 13% decrease in passive stiffness (P<0.05) on average, this returned to baseline levels within10 minutes post stretch.

There was no significant change in stretch reflex excitability following a 30 minute stretch, regardless of the torque applied (P>0.05). There was a significant change in stretch-evoked stiffness following a 10 minute stretch (P<0.05). Post hoc tests revealed a 25% (±46%) decrease in stretch-evoked stiffness immediately post stretch (P<0.05). This then significantly increased 10 minutes post stretch, such that it was 31% (±60%) higher than baseline levels.

**Conclusions**: Stretches using higher torques led to significantly greater gains in ROM. Longer duration stretches of 30 minutes achieved significantly greater improvements in passive muscle stiffness compared to 10 minutes with improvements being maintained for up to 30 minutes post stretch.

The effect of constant torque stretches on stretch-reflex evoked stiffness varied

with the length of stretch. Rebound increases in spasticity after the end of a stretch were seen, these were temporary and the cause of this change and their effects on function requires further investigation.

**Implications**: The torques applied in this study were within the range that pwMS could apply during manual stretches of the ankle plantarflexors (Ofori *et al*, 2011). Thus, this study has implications for the short term clinical management of stiffness and contracture. We did not find that stretching for a period greater than ten minutes reduced spasticity. The impact of the reduction in passive stiffness and improvement in joint ROM on functions such as walking ability need to be assessed.

**Keywords**: stretching, multiple sclerosis, spasticity, torque, stiffness

**Funding acknowledgements**: This study was funded by an MS Society grant (907/08)

**Ethics**: This study was conducted with the approval of Devon and Torbay REC (REF 09/H0202/42)

# ACPIN AGM

### 2012

### **Minutes of the ACPIN AGM 2012**

The meeting opened at 12.15pm

1 Welcome and introduction to committee members

Committee members present: Adine Adonis, Lorraine Azam, Sandy Chambers, Jo Kileff, Siobhan MacAuley, Chris Manning, Margaret Mayston , Gita Ramdharry, Anne Rodger, Jane Petty, Kate Busby, Lisa Knight, Nicki Guck

### 2 Apologies

Emma Proctor, Jakko Brouwers

### 3 Minutes of AGM 2011 Accepted as an accurate account Proposer: Chris Manning

Seconder: Adine Adonis

4 President's address Margaret Mayston

### 5 Chair's address Siobhan MacAuley

### 6 Treasurer's report Jo Kileff Proposal to retain the current accountant: Langers Proposer: Helle Sampson Seconder: by Chris Manning

# 7 Re-election of *existing* officers to the Executive Committee

Honorary PRO Adine Adonis Proposer: Gita Ramdharry Seconder: Kate Busby

Honorary research officer Jane Petty Proposer: Cherry Kilbride Seconder: Andrea Stennett

### Synapse editor Lisa Knight Proposer: Margaret Mayston Seconder: Anne Rodger

iCSP officer Chris Manning Proposer: Jane Petty Seconder: Anita Wade-Moulton

Membership secretary Sandy Chambers Proposer: Sue Edwards Seconder: Kirsty Elliot

# 8 Election of *new* officers to the Executive Committee

**Committee member** *Ralph Hammond* Proposer: S Paddison Seconder: H Sampson

### Committee member

*Jennifer Barber* Proposer: Kirsty Elliot Seconder: Claire Guy

### 10 Constitution

Amendment to the constitution as published on notice boards and distributed to regional reps. Accepted by majority vote.

### 11 Affiliation agreement

Vote for acceptance of affiliation agreement. Accepted by majority vote.

### 12 AOB

None

The meeting closed at 1.00pm.

# President's address

### Dr Margaret Mayston

The text of this address appears on page 3 of this edition of *Synapse*.

# Chair's address

### Siobhan MacAuley

Our regional reps have all worked together recently and produced A *Guide to Running an AGM* so I hope we are complying so far, and that I can follow their instructions on the Chair's address!

The instructions are to produce a report of a description of the work over the past year, "you may wish to mention particular successes, frustrations, funding difficulties, volunteer contributions or staff changes", "to thank those that have contributed" and that the report should "be fairly upbeat unless you are going to report the folding of your organisation". That makes it all fairly easy and straightforward for me!

In a year of lots of changes within the healthcare system, particularly in England but no doubt to follow in the other three countries, ACPIN has remained buoyant healthy and growing!

We have 2,600 members now and a streamlined online membership system, thanks to a mammoth task undertaken by Sandy. So clearly upbeat as we are not in any danger of folding!

We hosted an outstanding neurology strand at CSP congress last year, and a big thank you to Chris for that.

We have reached capacity for this conference and unfortunately even had to turn some delegates away, a sign that ACPIN continues to provide its members with superb continual professional development. Thank you to Lorraine and Nicki for organising the delegates and the exhibitors.

We successfully facilitate links with a number of other professional groups and tomorrow morning you will get a full account of the work and contribution from Jo Tuckey, Cherry Kilbride, Bhanu



Outgoing Chair Siobhan MacAuley and the incoming Chair, Gita Ramdharry at the 2010 ACPIN conference and AGM.

Ramaswamy and Fiona Jones when they present their speed updates.

Some of the frustrations have been the work regarding the formation of the professional networks with the CSP. We have now become a 'professional network' and sit within the neurology alliance with ACPIVR. This was part of a streamlining exercise within the CSP. As a result we have also had some minor adjustments to the constitution namely to do with the membership criteria.

Funding difficulties ... clearly not an issue as Jo Kileff will report shortly.

Volunteer contributions ... all ACPIN committee members are volunteers and manage to fit this in around work, family and other demands – so thank you to all the regions, committees and those that work for ACPIN.

There are a few changes to the committee with Kate Busby stepping down after a successful year as *Synapse* editor and changes to the Chair and Vice Chair role.

ACPIN are always looking at ways to improve and deliver our best to you, so please fill in your delegate forms and let us know how we can do that.

The thank-you's are plentiful as I am only the spokesperson for a tireless network of people behind me. A big thank you to our President, Margaret Mayston, to all the exec and regional committee members and local ACPIN groups. A thank you to Lorraine Azam for all the delegate arrangements and making your stay enjoyable.

As I am finishing my role as chair and stepping down from the executive com-

mittee I would like to offer a personal note of thanks to you all, for allowing me the honour of being Chair, a thanks for all of those people behind me on the committee, to those of you who gave your unending support and those who were on the end of the phone when I didn't quite know what to do!

Thank you and I wish ACPIN every support in the future, over to you Gita and Jakko!

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### **Treasurer's Report**

### Jo Kileff

I will now present a summary of the financial accounts for National ACPIN for the year end 31st December 2011.

The total income (*Figure 1*) was £80,580. This was a decrease on last year's income and was mainly due to a decrease in income from the March conference, which was intended to return some monies to the membership. We can see in the income figures that we have had another substantial increase in our membership and a resultant increase in capitation. Bank interest remains low and we need to continue the debate on where to put the money whilst it is waiting to be spent, which is proving reasonably difficult to do!

Expenditure (*Figure 2*) for 2011 was down by £10,748 compared to 2010. This was mainly due to less conference expenses, with it being a one day event rather than a residential course which naturally has more costs involved. The capitation and computing costs have increased, other expenses have stayed much the same.

Courses (*Figure 3*), divides the course income and expenditure up for the course that ACPIN held this year. The March conference was planned to run at a loss, with low course fees in order to put some money back into the membership. Despite this we have managed to end up breaking even. We had exhibitors for the first time in 2011 and the costs accrued from the exhibitors increased our income. Congress expenses were organised by the

Income	2010 £	2011 £
Course Fees	34,526	13,150
Congress	324	0
Membership	53,146	60,608
Capitation	3,186	5,864
Synapse	60	0
Database	784	899
Bank Interest	50	59
TOTAL	92,076	80,580

### Figure 1 **Income**

Expenditure	2010 £	2011 £	
Courses	26,202	12,198	
Synapse	12,187	8,374	
Travel	10,430	9,727	
Administration	4,486	3,818	
Capitation	7,393	11,710	
Computer costs	2,103	6,275	
UK Stroke Forum/ Stroke Guidelines	76	0	
Accounts, bank, sundry	1,445	1,472	
TOTAL	64,322	53,574	
Figure 2 <b>Expenditure</b>			

Courses	income £	expend £
March conf	13,150	12,198
Congress	0	0

### Figure 3 Courses

Reserves	£
Reserves brought forward	120,398
Surplus/(deficit)	26,549
Reserves carried forward	146,947

Figure 4 Reserves

CSP and hence there were no costs incurred.

The balance sheet (Figure 4) on the 31st December 2011 showed a profit of £26,549 and we carry forward reserves of £146,947 into 2012. We have explored and continue to explore ways of feeding this money back into the growing membership. We are still supporting the writing of splinting guidelines at a cost of £10,000. We have increased capitation to £5 per person despite no increase in capitation from the CSP as a way of directly influencing regions' income. We are heavily subsidising this conference again this year and will continue to run our courses at a very low rate. We are investigating other ideas to allow regions to benefit. Siobhan was concerned that she would leave as chair having spent too much money. However, no matter how hard we try, we continue to make money! If only we had the same success with our own accounts! If anyone has any suggestions of projects that ACPIN could get involved in that would benefit all members, do speak to one of the committee.

### **Copies of Accounts 2010**

Full copies of the ACPIN accounts for 2011 are available on request.

### Vote for accountants

Vote to retain the current accountants for 2012: Langers, 8-10 Gatley Road, Cheadle, Cheshire, SK8 1PY.

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### **Delegate report**

Every place had been booked, speakers and exhibitors ready and the 'Backbone of Neurology' conference was eagerly anticipated. Looking at the programme the delegates should not be disappointed.

Professor John Rothwell led the way with an engaging presentation on plasticity in neurorehabilitation, discussing the current thinking around the importance of this topic amid other factors that might affect outcome. He concentrated on the changes that could take place in the brain rather than the spinal cord due to the greater complexities this presents. Using researched examples he led us through the importance of variability, reward and skill transfer as the main contributory factors to facilitating plasticity and changes in outcome. Surprising to many delegates who have heard him before were his thoughts that plasticity per se was not as important as was once thought, but it is important to put it into the context of adaptation and motor skills acquisition.

This led on well to Associate Professor Lisa Harvey's presentation on the 'Management of Spinal Cord Injuries'. Using clear headings of assessment, goal setting, analysis and evidence based practice she explored the finer details of the skills a physiotherapist would build up specialising in this field. Steeped in a gold standard of the importance of RCTs, Lisa led the delegates through asking questions of established practice such as passive movements, stretching and strength training. With the emergence of more robotic and stimulatory equipment there was time to discuss this and their role in current rehabilitation.

She discussed the importance of not raising the expectations of patients for their outcomes but to keep a realistic and open mind.

Much of Lisa's talk resonated with the next speaker, Melanie Reid. Melanie sustained a spinal cord injury in April 2010, and since that time has continued to write a regular column in *The Times* newspaper charting her progress.

Hooked by a resonance in Siobhan's email acknowledging rehabilitation is like 'pushing a pea uphill with your nose sometimes' she agreed to travel to Northampton, via Birmingham airport and give what was an illuminating insight into her experience of spinal cord injury. It generated much discussion. Notable quotes were: 'the gap as a patient between perception and reality', 'wanting to be in the gym was her salvation', how in the gym there was often a combination of 'deep emotion and gallows humour', her dislike of the light use of the term 'functional', feeling the lokomat was her 'breakthrough in recovery' and most discussed off line the 'fine line between not giving false hope but encouraging hope'.

The AGM was concise and informative and contained a great title from Margaret Mayston in her address, 'Participate or Perish'.

The four workshops for an hour and a half each were a success and all well attended.

Michelle Price, a consultant physiotherapist rounded off day one with an illuminating and informative session talking about stroke service changes in Powys and how they have been working towards meeting need in new and innovative ways using outcome to shape services. She referred often to the PDSA model, Plan, Do, Study, Act.

The evening gala dinner was very well attended and involved dancing into the night with live music.

Saturday started with 'Speed' updates from work that is represented via ACPIN. These were the Splinting Guidelines due in 2013 which have been jointly planned by both physiotherapy and OT organisations. The work will be undertaken by Brunel University, and clinical involvement will be requested by a Delphi Method; expression of interest should be sent to jotuckey@aol.com. The other updates were from the International Neurological Physical Therapy Association (INPA), the Intercollegiate Stroke Working Party (ICSWP), Behind the Scenes for Parkinson's and the UK Stroke Forum (UKSF).

Fiona Lindop presented the Parkinson's physiotherapy audit which highlighted the desire to improve standards of care and equitable service for all. The full results will soon be available and Fiona highlighted the wealth of material available including the UK quick reference cards.

Professor Jon Marsden gave an enlightening talk on the effect of temperature on neuromuscular function. He explained how cooling can change neuromuscular function but that this is altered with differing pathology. He also talked about how temperature can alter tremor and the variable results in relation to spasticity.

Ann Roger unpacked vestibular rehabilitation in a talk which must have opened up this topic as an essential addition to a therapist's toolkit. Anyone working with older people needs to be aware of the importance of assessing for any impairment in the peripheral vestibular system affecting balance and dizziness. She went through a comprehensive summary of assessment which therapists can explore further.

Lisa Harvey ended a busy weekend with two sessions, firstly some indications suggesting the lack of evidence for passive stretch to avoid contractures. It highlights the importance of clinical reasoning and mature decision making when considering treatment modalities. Her second session was to share a number of ways we can use information technology to better share practice and communicate around the world. Lisa discussed web based exercise resources, an e learning package, professional forums and mobile applications. (www.physiotherapy exercises.com and www.scipt.org)

Dr Lisa Bun delivered a presentation looking at the cause of balance impairment in patients with cerebellar disease. Summarising a detailed understanding of her subject, Lisa then described a newly designed home based therapy whose early results suggest as a potential intervention.

Finally, and still from the south west team, Professor Bernhard Haas rounded off a very successful conference which pulled together many strands that had been discussed over the two days. His subject of identifying the most effective exercise to take people to the next level was supported with a comprehensive combination of evidence. Among the evidence suggested for effective exercise was strength training, intensity, velocity, psychological elements, motivation and environment.

This was a highly successful two day conference exploring the backbone of neurology, with new ideas, comprehensive exhibitors and a buzz around the delegates. The well attended dinner and live music added to a relaxed networking environment and once again thanks for a huge effort by the executive committee. This year also saw Gita Ramdharry take over the chair from a busy and committed two year term from Siobhan MacAuley who will be very much missed by all.

# WIN A FRE PLACE TO CPIN AGM 2013! Annual prize for the two best articles or case studies supplemented to Synapse in 2012 editions Closing date for

Closing date for supplementing articles is August 6th 2012. Winners will find out in January 2013. This will be rolled out annually.

Please email Lisa Knight, *Synapse* coordinator, on **lisaknight@finchingfield.plus.com** for all correspondence.

ALL LEVELS OF EXPERIENCE ARE ENCOURAGED TO ENTER!

# SHARING GOOD PRACTICE 1 Writing a case report

Gita Ramdharry PhD

Case reports are defined as replicable, detailed and credible descriptions of practice where there is an integration of the best available research evidence with clinical experience.

Case reports are a good way for physiotherapists to start writing for publication. Preparing the manuscript will develop skills in concise written communication and critical thinking. It is also a good way to learn about a topic. Any description, any patient or patient management scheme that has not featured previously in the literature is worthy of describing in a case report. We are a relatively young profession that often struggles to verbalise what we do. This can be a great opportunity to showcase our creativity and worth.

Case reports are low down in the hierarchy of evidence, so what is their contribution? A comprehensive case report will provide new knowledge through documentation of a novel occurrence. The report will be of interest to other physiotherapists and will be educational. The report may also form preliminary work or evidence for larger studies.

Cases can be reported retrospectively or prospectively. Retrospective cases are the most common reports published. The intervention may be well described and of high quality, but often the best outcome measures will not have been used. This will affect the credibility. Prospective reports involve some forward planning of the intervention and data collection. This can be done over multiple time points in a time series case description e.g. three measurement points. It is possible that ethical approval may be required. It is wise to check with your local trust research and development department first. You may find that guidance varies from trust to trust.

Most case reports fall into three main categories:

- 1. **Diagnostic or assessment reports**: An assessment or diagnostic method is described. This is often a description of a rare or complex case.
- 2. **Treatment or management reports**: Detailed descriptions of interventions and outcomes.
- 3. Educational report: A presentation of current practice strategies with presentation of the literature.

Many case reports are between 1,500 and 2,000 words in length, but this will depend on the journal. It's best to check with the author guidelines first. Many guidelines will also recommend a structure but it is often as follows:

### Title

This should be an accurate and concise description of the study. Some authors recommend four elements to a study title: the intervention; the outcome; the population under study and the condition of interest.

### Structured abstract

This should be a structured summary of about 200 words. Some journals will provide headings they prefer to guide an abstract.

### Introduction

In the introduction, there should be a clear statement of the purpose of the report or study. The background and contribution to the literature should be highlighted.

### Case report (methods and results)

This is the most salient part of the report. The details of the methods and intervention are documented here, plus the primary aspect of the patient's condition. Keep the results brief and succinct.

### Discussion

This is the section where you make sense of the findings. You will discuss how your outcome contributes to the literature but be clear about your limitations.

### Conclusion

This is the overall conclusion statement but be careful not to be too far reaching in your suppositions and avoid using unsupported statements.

### Acknowledgements

References

Tables

### **Figures and captions**

Although case reports can make a contribution, you must be aware of the limitations. The interventions described will usually occur in an uncontrolled environment. There can be other confounding factors that may have influenced the outcome in addition to the intervention you describe. Because of the issues with generalisability of case reports, you cannot conclude that management will be effective for other patients. When reading case reports, be aware that publication bias is prevalent with this type of report. Cases may have been cherry picked to best illustrate a hypothesis or standpoint.

To get started the first step is to formulate your idea for the report. You could talk it through with a colleague to structure your thinking. Don't forget to jot down their feedback afterwards. You may also use a tool like a mind map. Then it's time to jump in. I recommend that if you're struggling to get going, don't aim for a perfect first draft. Either sit with a pen and paper and just write or type at your PC without going back to edit for five to ten minutes just to start the process. Review what you have written and underline the main points emerging. You can then go back and write again, bringing these points together so your ideas are refined. I also recommend that you get someone else to read it and give you constructive feedback on the clarity and message.

Then you are ready to submit. You should have decided where you will submit before you finish the manuscript, to ensure it meets all of the journal requirements. Many physiotherapy journals are case report friendly and our very own *Synapse* is very keen to receive your work! Expect criticism from the review process and don't be put off if it seems harsh at first. Use it to refine the report. It will be a better paper for the independent feedback and your revisions based on it.

Go on, jump in! I know there is some fascinating practice out there. I'm looking forward to reading it soon!

### REFERENCES

Albrecht et al (2009) The role of case reports in evidence based practice, with suggestions for improving their reporting Journal of the American Academy of Dermatology 60 pp412–418.

Green *et al* (2006) *How to write a case report for publication* Journal of Chiropractic Medicine 5 pp72–81. McEwen (2004) *Case reports: Slices of real life to compliment evidence* Physical Therapy 84 pp126–127.

Neely et al (2008) Practical guide to understanding the value of case reports Otolaryngology – Head and Neck Surgery 138 pp261–264.

Rothstein (2002) *Case reports: still a priority* Physical Therapy 82 pp1062–1063.

# SHARING GOOD PRACTICE 2 Functional stroke training evaluating a community -based programme

In 2001, a functional training programme (ARNI – Action for Rehabilitation from Neurological Injury www.arni.uk.com) was developed for people with stroke by a stroke survivor called Tom Balchin.



A year-long feasibility study of this approach using ARNI trained exercise instructors has been completed by Brunel University London in conjunction with physiotherapists from the Hillingdon community team and Hillingdon Hospital and staff from the leisure services of the London Borough of Hillingdon (LBH). The study was funded by LBH from their National Stroke Strategy monies; this was supplemented by an ACPIN research bursary award.

The study evaluated the delivery of four twelveweek stroke groups using a combination of laboratory and functional based tests including balance, gait, strength and quality of life measures taken before and after the twelve week programme and then three months later. Focus groups were conducted to explore the experience of participation.

Results indicate a significant improvement in functional balance and in the overall score of the quality of life measure. Gait speed also improved sufficiently to reach the 'minimal clinically important difference', although this change was not statistically significant; changes were noted in strength but they did not reach the level of significance. Participants reported positive changes in their 'real life' capacity including being able to hoover again, having the confidence to join a gym, using the underground, going to the pub and one person has even started to train as an ARNI instructor!

Plans for the future include sourcing funding for more classes to take 'new comers' once formal rehabilitation has stopped and for a continuation class for people to carry on with their exercises in a group environment if they wish. Funding is also being sought for a fully powered trial to continue to explore the effectiveness of the ARNI approach. The full results of this study are currently being written up for publication.

For further information about the project please contact:

- Jackie O'Dowd (Jackie.o@dowd@nhs.net) (Community Physiotherapy Team)
- Centre for Research in Rehabilitation CRR@brunel.ac.uk (Cherry Kilbride and Meriel Norris)
- Centre for Sports Medicine and Human Performance (amir.mohagheghi@brunel.ac.uk)

# SHARING GOOD PRACTICE 3 Sharing 'local' practice Wessex ACPIN

**Jenny Barber** 

Wessex ACPIN held an evening lecture on Tuesday 19th July 2011. This was entitled 'Sharing Local Practice' and highlighted projects that had been developed locally. The evening was hosted by physiotherapy staff at the Turner Centre, St James's Hospital, Portsmouth. The aim of the evening was to share good clinical practice amongst colleagues and further discuss issues about these clinical areas.





Alahna Barratt and Carl Adams.

*left to right: Margaret Martins, Laura Dyer and Emma Harris.* 

The projects were mainly undertaken by Band 6 physiotherapists from the Portsmouth and Southampton areas. Both projects had taken at least a year to develop.

The first presentation was a project that reviewed the outcome measures used by local physiotherapy staff within neurology. The project collected information on what outcome measures were actually being used and whether there was a trend amongst physiotherapists locally. Why certain outcome measures, as opposed to others were used was also evaluated. The outcome measures that were regularly used by physiotherapy staff were evaluated to see if they were the most appropriate, and in line with best practice. Further development was undertaken to try and collate a database of certain outcome measures that could be easily accessed.

The second project looked at the format in which exercise is prescribed (within neurorehabilitation). Patient data was collected from focus groups and local physiotherapy staff completed a questionnaire. There were several results from this project. An example is that patients' preferences in exercise

### NHS

Neurological Rehabilitation: The format in <sup>solent He</sup> which we prescribe exercise - What is current practice and does it meet patients' needs?

BACKGROUND	METHODOLOGY	FINDINGS
- Exarcise prescription is a vita component of the four planar investment of a serie of the four planar investment of the series of the series of the series planar investment of the series of the series of the series planar investment of the series of the series of the series are both occepts that are supported for the followed thereines "series" (Series	Patient data was collected by focus groups and physiotherapy staff data collected by operationnaire.	The majority of patients were very positive in respect to existing exercise provisions.
	Focus Groups • Focus groups were selected for the project to reduced for the project to	<ul> <li>Papens left that some aspects or exercise prescription were well established and meeting their individual needs, however suggestions for 5 other individual needs.</li> </ul>
	A series of three focus groups were held, one for each area of clinical practice (community, in-	Patients' preferences in exercise prescription were primarily focused around the content and
	patent rehabilitation and outpatients).	delivery of their exentise programs.
	of thematic and statistical analysis	exercise prescription.
	RECOMMENDATIONS	
PRODUCTION	CONTENT	DEI NEDY
Individual physiotherapy departments should	All exercises prescribed should be supported by	All exercises prescribed and issued on a hand
strive to provide an easily accessible resource hat contains:	an individualised exercise sheet handout that contains:	out should be supported by:
Commonly used, pre-prepared exercises	> Typed written instructions supported by pictures applies diagrams	<ul> <li>Clear explanation of the reasons behind completing the exercise</li> </ul>
> The ability to mix and match exercises	> No technical terminology	> Clear explanation and demonstration of how to complete the exercise
Easy access to printing and/or photocopying Resources tailored to the individual working environment	Space to include patient specific goals	> Opportunity to practise with guidance and feedback from the physiotherapist
		> Positive reinforcement and encouragement
CONCLUSION		
CONCLUSION It is essential that physiotherapy departments have	e adequate resources to enable production of the ex	rcise handouts that patients desire.
CONCLUSION It is essential that physiotherapy departments have Patient motivation and compliance with exercise is	e adequate resources to enable production of the ex s enhanced by an exercise sheet tailored to their indi	rrcise handoute that patients desire. ridual goals.
CONCLUSION It is essential that physiotherapy departments have Patient motivation and compliance with exercise is Exercise prescription is more than Only when this process is as use	e adequate resources to enable production of the ex- s enhanced by an exercise sheet tailored to their indi- providing a sheet of paper; it is a joint pri- cessful will optimal compliance and bene	rcise handouts that patients desire. idual goals. ccess between patient and therapist. fits from exercise be achieved.

Figure 1 Recommendations poster

prescription were primarily focused around the content and delivery of their exercise programme. Further recommendations were divided into the production of exercise information, the content of the exercise and the delivery of the exercise (see *Figure 1*).

In summary, the evening was well attended by members of Wessex ACPIN and it was agreed that the discussion at the end of the evening was extremely interesting and stimulating. I think it is definitely something that could and should be extended out to all regions in the future to ensure that local research is better shared and acknowledged. Further information about either of these projects is available upon request.

# SHARING GOOD PRACTICE 4 **A novel technique** to attach Velcro straps to fibreglass splints

Splinting is one of the important interventions in the treatment or prevention of contractures.



The physiotherapists at Holy Cross Hospital, a specialist centre providing rehabilitation and long term care for people with severe and complex disability, developed a technique to incorporate aluminium screw rivets (homecraft Rolyan) when fabricating fibreglass splints. These screw rivets were used to attach straps which were used instead of a crepe bandage to hold the splints in position. When fabricating the splint one part of the rivet was placed between the Scotch Cast layers and a custom made strap was attached to the splint by using the other (screw) part of the rivet. Positioning of the screws and the length of the straps are flexible depending on the part of the body/limb that is being splinted eg a figure of '8' strap can be used when applying an elbow splint. The use of straps for application/ securing of the splint has become popular with staff as it has made the process easier especially in patients with high muscle tone. A document with step-by-step instructions on how to incorporate the screw rivets and attach the strap will be made available in the neurology section of the interactive CSP. Please acknowledge source (Holy Cross Hospital) when using or quoting this technique.

### If you have any questions please contact:

Rasheed Meeran (r.meeran@holycross.org.uk) Physiotherapy team leader, Holy Cross Hospital, Haslemere, Surrey GU27 1NQ

# **RESOURCES OF INTEREST** WEBSITES GUIDELINES PAPERS

This feature contains resources which may prove useful in clinical practice. Please share any resources by contacting the editor via email.

### WEBSITES

### www.scipt.org

The international Network of SCI physiotherapists (SCIPT) is a not-forprofit initiative of physiotherapists worldwide. It is for physiotherapists working in the area of spinal cord injuries, although other physiotherapists are welcome to join. The website contains presentations, documents and videos. Registration is free.

### www.physiotherapyexercises.com

This website has been promoted before but in case some are not familiar re: this website it will enable you to:

- Search for exercises appropriate for people with spinal cord injuries and other neurological conditions.
- 2. Select exercises and compile them into booklets for your clients.
- If you register (this is free), you can:
- 1. Save your clients' exercise booklet
- 2. Edit the text of exercises
- 3. Format exercise booklets in any way.

### www.elearnSCI.org

An e-learning site for health professionals working in the area of spinal cord injuries. Provides a series of online modules for students and junior clinicians. The learning content includes, case studies, videos, selfassessment and lectures. No fee!

### www.rehabmeasures.org

The website was designed to help clinicians and researchers identify reliable and valid outcome measures within all phases of rehabilitation. It provides a list of instruments each with evidence-based summaries, instructions for implementation including length of tests, and a link to the instrument in a pdf format. Although the instruments currently in the database only contain full reviews for stroke and spinal cord injury, more diagnoses will be added shortly.

### www.neurosymptoms.org

An excellent website for patients with functional symptoms/ conversion disorder/ dissociative symptoms.

### www.improvement.nhs.uk/stroke

You can access an eBulletin produced by the Stroke Improvement Programme and is available to anyone working in healthcare, social care, or the voluntary sector with an interest in stroke. It contains up to date projects and relevant information centred around stroke care. You can email infor@improvement.nhs.uk to opt in or out at any time.

### www.stroketraining.org

Contains core competency stroke training and ten advanced modules on the multidisciplinary management of stroke.

### www.ebrsr.com

A comprehensive and up to date evidence-based review of stroke rehabilitation.

### www.appde.eu

This is the website for the Association of Physiotherapists in Parkinson's Disease in Europe. There is a newsletter tab, which provides you with up to date news on PD in Europe.

### www.parkinsons.org.uk

Don't forget to use the cue cards available to assist in all staff's clinical practice with Parkinson's Disease patients. They can be downloaded from this website.

### www.1000livesplus.wales.nhs.uk/ programmes

You can access *The Quality Improvement Guide* online from this website. It provides simple but effective tools and strategies to equip staff to drive change forwards and assists in developing leadership skills and highlighting the importance of utilising teamwork. It is based on the 'Model for Improvement' developed by associates in Process Improvement (www.apiweb.org) which has previously been used very successfully in the UK and USA. The guide particularly focuses on the health structure in Wales but lot of the theory could be utilized throughout the UK.

### **GUIDELINES**

### Mind The Gap; Enhancing therapy provision in stroke rehabilitation NHS Improvement (November 2011)

http://system.improvement.nhs.uk/Im provementSystem/ViewDocument.aspx? path=Stroke%2FNational%2Fwebsite %2FMind%20the%20gap%2FMind\_the \_Gap.pdf

### DOH: Service for people with neurological conditions National Audit Office

www.nao.org.uk/publications/1012/neu rological\_conditions.aspx

# FOCUS ON... 1 Paralympic classification Paralympics GB

### The history of classification

In the 1940s, Dr. Ludwig Guttmann founded paralympic sport as an extension of the rehabilitation process. During the early years of the paralympic movement, classification was medically based. The organizational structure of medically based classification systems reflected the structure of a rehabilitation hospital, with separate classes for people with spinal cord injuries, amputations and those with other neurological or orthopaedic conditions.

Athletes received a class based on their medical diagnosis, and competed in that class for all sports offered. An athlete with a complete L2 spinal cord iniury (resulting in lower limb paresis but normal arm and trunk power) would compete in a separate wheelchair race from a double above-knee amputee because their medical diagnosis was different. The fact that the impairments resulting from their medical condition caused about the same activity limitation in wheelchair propulsion was not considered in the classification process because classification was based on medical diagnosis.

### Sport drives classification

As the paralympic movement matured, sport was no longer an extension of rehabilitation and alone became important. The focus on sport, rather than rehabilitation, drove the development of what commonly became referred to as functional classification systems.

In functional systems, the main factors that determine a class are not diagnosis and medical evaluation, but how much the impairment of a person impacts upon sports performance. For example, in athletics, an athlete with a complete L2 spinal cord injury now competes in the same class as a double above-knee amputee (class T54). This is because these impairments have an impact on wheelchair propulsion that is approximately the same. Currently most paralympic sports use systems of classification that are described as functional, a notable exception being the classification system used by the International Blind Sports Federation (IBSA) which remains medically based.

In contrast to the medical classification approach in which athletes competed in the same class for all sports, functional systems of classification need to be sports-specific. This is because any given impairment may have a significant impact in one sport and a relatively minor impact in another. For example the impact that bilateral below elbow amputation has on swimming is relatively large compared with the impact on distance running. Basically, in functional classification systems, an athlete with such impairment would compete in a class that had relatively greater activity limitation in swimming than they would in athletics.

### Leaving medical classification

The transition from medical to functional classification systems began in the 1980s. There was however a considerable debate surrounding the relative merits of the medical and functional approaches that caused the transition to be slow.

One feature of early functional systems was that they comprised fewer classes than the existing medical systems. Event organizers favoured this because the complexity of event organization was significantly reduced. In 1989, the bodies responsible for organizing the Barcelona 1992 paralympic games – the predecessor to the IPC (International Paralympic Committee), the International Coordination Committee of World Sports Organizations for the Disabled (ICC), and the Organizing Committee – signed





an agreement which stipulated that all paralympic sports contested at the Barcelona 1992 paralympic games were to be conducted using sports-specific functional classification systems. This administrative decision greatly accelerated the transition to functional classification systems. At the time of this decision many sports had not begun to develop functional systems. Given the short timeframe and the absence of relevant scientific evidence. the classification systems that were developed needed to be based on expert opinion. Within each of the sports, senior paralympic classifiers from a diverse range of backgrounds (medical doctors, therapists, athletes and coaches) led the development of functional systems of classification.

### Paralympic classification today

Since the widespread adoption of functional systems of classification, paralympic sport has continued to mature rapidly. Currently there are



more than 15,000 registered competitors with the international governing bodies of the 25 paralympic sports, and a much larger (but indeterminate) number of athletes competing at local, national, and regional level in their home countries that are not registered internationally. At the elite level, successful paralympic athletes are receiving increasing peer and community recognition and many receive commercial sponsorship and other financial rewards.

It is well recognized that the classification an athlete is assigned has a significant impact on the degree of success they are likely to achieve. Unfortunately however, paralympic classification and classification research have not matured as rapidly as other areas of paralympic sport and current paralympic classification systems are still too often based on the judgement of a small number of experienced classifiers, rather than empirical evidence. As a consequence, the validity of the methods used in functional classification systems can be strengthened. In 2003, the IPC developed a classification strategy with the overall objective to support and coordinate the ongoing development of accurate, reliable, consistent and credible sport focused classification systems and their implementation. The IPC Classification Code is a direct result of recommendations made in this strategy.

The IPC recognizes the need for systems of classification that are evidence-based and mandates the development of such systems.

### Future outlook

The IPC continues to be committed to the development of evidence-based classification systems, so that athletes who enhance their competitive performance through effective training will not be moved to a class with athletes who have less activity limitation (as they would in a performance classification system), but will be rewarded by becoming more competitive within the class they were allocated.

# FOCUS ON... 2 **Steve Brown** Wheelchair rugby captain- GB Team

# "What inspired you to be involved in wheelchair sport?"

Before my injury I was very sporty and especially into team sports, jumpers for goal posts and all of that. I liked the social aspects, and the trust and friendships that built up. When I was in hospital in June 2005 I missed it and did not realise how important sport was to me. During rehab I got involved in table tennis and swimming but they didn't have that 'edge' and I was not strong enough to be involved in basketball. Then one day I was asked if I was interested in watching a GB wheelchair rugby game. I was not strong enough to push the distance so my Dad pushed me down to the Stoke Mandeville Stadium. Here were a bunch of guys doing their best to get people out of their chairs while I was

![](_page_41_Picture_12.jpeg)

struggling to stay in it. Watching them I could not believe they were as injured as me but gradually I discovered that some of their injuries were higher than mine. Two days after my discharge in October 2005 I went to my first training session.

Everything was new to me, the lifestyle, the sport; it was not like returning to football, but everyone was so friendly and welcoming, and they really helped me to come to terms with my injury. Now it is hard to believe I am captain of this team.

### "How has involvement in sport changed your attitudes, or feelings about yourself or others?"

I had always been motivated in whatever I did and wanted to be good at it so when I took up rugby, I set small goals to achieve all along the way and I knew to be good at it I needed to work hard. I am keen to support and help others who have the drive and desire to want to succeed and it is great to see people achieve their potential.

# "What would your advice be for anyone newly injured?"

Look at the glass as half full. See how others have achieved things and believe in yourself. Also to keep things in perspective! It should not have taken me to lose two thirds of my body to make the most of the other third.

"What is the feeling of the honour of being able to captain the rugby team at the London Paralympics?" Representing your country in anything is an absolute honour. I remember a coach saying to me after I had been at

a Kent Crusaders training sessions "You are the right shape, height and have the motivation and if you put in the work you could represent your country. From then on, I knew if I worked hard this was possible. With loads of support from physios, coaches, nutritionists I just worked to improve. I remember the meeting I had when they offered me the captaincy and as I went in I thought I had done something wrong. Seeing me nervous, they assured me everything was fine and told me they would like to offer the captain's role to me. I was lost for words and then said yes.

"Do you have any top training tips?" Do as you are asked. There is so much support from strength coaches, conditioning teams, nutritionists, physios and they know what you need to do, listen to them and work towards your goal. One question I always ask myself is, "Is this going to make my chair go faster?" What I eat and when I go to bed will make a difference. By not following their guidance it is contradictory to all I've strived for. For me self-direction and self motivation is key and in the team I cannot afford to be the weak link.

During training today I looked around the athletes and what they were working for. It takes your breath away seeing them working so hard towards their own goals, keeping fit and healthy. They work so hard for their coaches and teammates, striving for their best.

# FOCUS ON... 3 Jane Petty

# Life as the national programme physiotherapy lead for the MS Society

I began working for the MS Society six years ago after 30 years service in the NHS. My final job in the NHS was as Clinical Lead for Neurology at the Royal Hallamshire Hospital in Sheffield.

The original remit of my current job was very much focused on supporting the MS Society's strategy to develop new physiotherapy and occupational therapy posts in the NHS and in Social Services. In those days, the Society invested significantly in pump priming the development of new services. In the last three years, the emphasis has changed to influencing and overseeing the sustainability and development of high quality services.

We knew from a scoping exercise of the Society's membership, that people affected by multiple sclerosis, valued physiotherapy as much as the support of the specialist nurses. However, it also became obvious that it is much more difficult to gain funding for MS therapist posts.

It was – and still is – hard to get recognition for the consultant or specialist role for Allied Health Professionals in the NHS and we also know that many therapists do like to keep their skills within other long term neurological condition groups. One way round this, was to support the development of neurotherapist posts, which later could develop a specialist interest in MS. Their work could be supported through the MS Society's information and education strategy, and also through the MS Professional Network. It also became evident that we needed to collect information and evidence on the impact of these posts, to make sure they were sustainable in the long term.

Working with the post holders and with our service development officers, I have supported professionals to deliver high quality evidence based practice. This work is now shaping our future educational offer to professionals. I

![](_page_42_Picture_16.jpeg)

have helped physiotherapists to measure the impact of their posts through MS-specific outcome measures, satisfaction surveys and the cost effectiveness of keeping people out of the acute setting and supporting selfmanagement within the community.

Right now, we are developing a UKwide service development toolkit, to help post holders to assess and develop services. Several projects are underway to help nurses and therapists measure the cost of their service and how they can demonstrate they are making savings (using the MS Society's Cost calculator©). We are working on adapting the economic value of for example: a physiotherapist in stroke care, to one specific for MS and will be holding workshops for allied health professionals on how to use the tools developed in the future.

Another important aspect of my work is to develop a position statement and resource base for physiotherapy and exercise. There have already been several different projects around exercise; providing advice for the newly diagnosed and introducing them to many different ways of exercising including kick-boxing.

The current work around physiotherapy and exercise is particularly important. This is because in 2010 the MS Society decided it could not continue to pump prime posts and would instead work to develop service models through a partnership of people with MS, our branch services, the NHS and other providers. The aim being, to develop pathways which focus on exercise fitness and physiotherapy.

This meant we had to develop evidence based practice through our research programme which will emerge as service models to help the sustainability and development of services and make sure we continue to see high quality services. I worked with the CSP to produce the document, *Physio works for MS* and to identify their research priorities around MS.

In addition to this, the MS Society research grant programme is currently funding research into:

1 The effects of a practical exercise programme on physical activity and quality of life in people with MS We know that exercise is beneficial to people with MS – but there are still many unanswered questions about who will benefit most, how much exercise is helpful and what types of exercise are recommended. An exercise programme designed specifically for people with MS will be tested in this three year study. 120 people with MS will be split into two groups. They will either receive a twelve week exercise programme or their usual care. Researchers will compare the following three things in the two groups of people:

- physical activity levels
- disability levels
- quality of life
- 2 A pilot study into the effects of Pilates on posture, pain, and quality of life in wheelchair users with MS This three month clinical trial of 30 people with MS who use wheelchairs looked at the impact that Pilates has on posture, pain and quality of life.

### 3 A three year clinical trial to determine if FES improves walking performance in people with MS. The following information is being gathered:

- the perspectives of 10 to 15 people with MS to assess how their walking performance and feelings of fatigue vary when using FES
- assessing the long term effects of using FES compared with another treatment for dropped foot, the dynamic ankle foot orthosis
- In 40 to 50 people with MS researchers will assess:
- feelings of fatigue
- ability to engage in activities of daily living
- levels of physical activity and quality of life
- 4 A one year pilot study explore if wearing textured insoles in shoes can improve balance problems experienced by people with MS. This builds on earlier research (already funded by the MS Society)

# 5 Using quality adjusted life years in MS.

A quality-adjusted life year (QALY) is a health economic tool used to compare different treatments and interventions – so that the NHS can make decisions on which treatments to fund. QALY's are a generic measurement however, and don't take the specifics of how MS can impact on a person's life into account. This means that some treatments and services

As well as working with clinicians and researchers, I still meet many people

with MS in my role at the MS Society. An issue that often arises is people feeling that they need access to neurophysiotherapy on a regular basis, to benefit from the service. It is part of my role to get people to think differently about how they could self manage their MS through exercise and activity.

Although we have supported the development of new posts, what also became obvious was that we had a network of branches throughout the country that were supporting physiotherapy, exercise groups and all sorts of activity opportunities.

Many of these volunteer branches also had significant funds and legacies that were not being used for the benefit of the wider MS population. They were only attracting a small percentage of the membership and people with MS in their area.

I am currently work with the branches and membership to change people's mindset, so that exercise and activity rather than continued physiotherapy is identified as the way to help people with MS maintain their independence.

I am also trying to address the issues that people with MS have told us about (through research from Leeds and Oxford Brookes Universities). One point made was that they felt the fitness instructors didn't understand the symptoms of MS. Consequently, we have jointly developed a Masters module with REPS 4 accreditation (for fitness instructors and physios) with Oxford Brookes University. This covers physical activity for people with a neurological condition and we currently offer 50% grants to undertake the study. The study is an e-learning resource with two weekends spent working with people with a neurological condition in a gym setting.

Work with our volunteer branches is focusing on setting up exercise and activity opportunities, ideally in partnership with other providers. This is so it can become part of a pathway to activity. We have also organised activity taster days where people with MS can try out activities such as archery, tai chi, climbing walls, boccia, Pilates, yoga and canoeing. The main principle being to demonstrate what opportunities there are out there to take part in activity, despite a disability. Another exercise initiative we are supporting is a pilot of Yoodoo sports with Leonard Cheshire. This aims to encourage disabled people to use leisure centres as a move on from the 'Inclusive Fitness Initiative' (IFI), using a buddy system. In Summary, the job I originally took with the MS Society has developed into a national programme, supporting therapists across the four nations of the UK. This involves more travel than I had originally anticipated and I have become something of a Billy no mates in hotel rooms! However, every day is different and I feel I am making a difference, using and disseminating the knowledge I have gained and am still gaining!

I can be contacted on: jpetty@mssociety.org.uk

# FOCUS ON... 4 The life of a PhD student

From a discussion had within our National ACPIN research workshop, it seems that entering into postgraduate research can be very daunting with noone knowing entirely what to expect, or how it should feel to be a student again! We have decided to follow two PHD students on their epic journey through the highs and lows that they will inevitably experience! The want to be able to share any useful advice they have to give to others along the way to assist with anybody who is thinking of pursuing the research avenue themselves.

### **PHD student 1**

Ever felt like you are just tired of the monotony of life and just wanted to do something different?

Well, that was me! I found myself in a job for a long time and thought I liked what I was doing. There were days when I felt that I wanted to do something different. But what was that something different? I never fully thought about that. To cut a long story short, I decided to go down the road of academia. I applied for and was awarded a PhD place at one of Britain's prestigious universities! This started my period of change and I was thrilled! With all the excitement I somehow did not think too much about going from being a clinician to a full time PhD student. How hard could it be anyway?

### The transition

I would like to think that I was a good clinician and that I made a difference

in the lives of my patients – blowing my own trumpet here! But making the transition was not easy. I suddenly went from a job where I was known, celebrated (by a few), to a place where no one knew my name, strengths or weaknesses. It felt like I was starting a new career and was at ground zero and had to work my way up, wherever up maybe in the academic world.

Also, I had to make the transition in my mind from working in a big team to working solo. Well, I paused and thought about that! Did I have to work solo? It was possible, because I had everything I needed. I had a well kitted out office that I shared with other PhD students. I was assigned a desk that had a panoramic view of the university. I was in full view of people passing, exquisite landscape, cars etc, priceless, but also had the potential to be very distracting. After much deliberation (in my mind) I made the conscious decision to enjoy the experience. So, I've decided to make friends and to bring some people along with me on my journey. Now we have a little informal group of like-minded PhD students. This I am beginning to see the fruits thereof. You will hear more about our group later.

### **Starting the journey**

"I'm still adjusting". Four months into the program and I find myself still making that statement. Oh dear! I've been to the library and have read books about people who have done their PhD so I can learn from them and help me to put things into perspective.

I am realising more and more that the relationship with your supervisors is crucial. I have two supervisors and have met them a few times now. But each time we meet my mind runs at a million miles per hour. There is usually more to read and more refining of my research question. I am now officially obsessed with finding this research question. I thought I had it 'nailed'. I thought I knew exactly what my study was about but I am now dubious. I was so eager to move swiftly to do my study, but I still have more reading to do. I've read already over 200 articles to choose the ones more relevant to my study. However, I can't tell you exactly what I've read because they've all rolled into one. I've been told by people who have walked this way before that it is best to go through this process now rather than later. This is to ensure that no one has done the study that you want to do. I must admit (only to you) that I now can see the logic behind this, as I am now a little more familiar with the key authors in my field.

I guess you are wondering who my supervisors are, but I can't tell you (smile) because this blog is anonymous (tee hee hee!) anyway back to the blog.

I became very concerned so I spoke to my little support group to see what they think about my little frustration. Rest assured they reported that they were going through the same issue. In academia they call what we are going through 'the process'. Apparently we all have to go through '**the process**'. This is where your supervisors challenge you about your study. They call this finding '**the research question**' haahha. Well, I thought I knew my research question but I'm now four months in and am still searching. Hopefully by the second blog (if they allow me to write anymore about this subject), I would have found my research question. Otherwise I will be in great trouble.

# So, what's good about doing a PhD anyway?

I'm sure you've heard a lot of horror stories like I have and you probably think I am a bit crazy to still proceed. But others have done it and so can I. I think of this phase of my life as a journey into the unknown, which is scary but can be exciting at the same time. I am able to do flexible working as I am in control (most days) about my start and end time. I get to choose my flexible working conditions. You might say that you get the same in the NHS and that is true but you have to apply for flexible working and make a very good case for it. I on the other hand just have flexible working and don't have to go through the drama of applying for it. Also, for the first time in a long while I get Christmas off. Yup, did not have to apply for leave over the Christmas period because the university was officially closed anyway. Wow! That was lovely.. I think the greatest thing though is getting paid to do something that I really enjoy.

So, 'am still adjusting'. I must now go and try to find my 'research question'!

### **PHD Student 2**

After ten years working clinically in the NHS I am now a full time student again! It has taken five years to get here but I am now where (I think) I want to be. I have taken a circuitous route to get to the starting point of my PhD journey but have learnt a lot about research processes along the way which will no doubt be useful in the future. In the first of this series I want to explain my personal experiences of getting to this point. I won't be putting any gloss on my experiences so I suspect that some people may be put off while reading this. My aim though is to encourage others to join me on this career route. It is not an easy one but six months in, it has already been very rewarding.

To go back to the beginning, I completed an exceptionally good post graduate diploma in neurological rehabilitation in 2006 at the University of Western Australia and discussed my future plans with Barby Singer the course leader. Having discussed my career plans with her she advised me on going straight to a PhD rather than building from an MSc. This advice has been corroborated by other researchers that I have spoken with however this is due to my particular career plans and others will find the MSc route prior to PhD a better option.

I had developed two main areas of interest by this time. Neuroplasticity, in particular the potential of transcranial magnetic stimulation as a therapeutic technique and spasticity, in particular the very early treatment of it. Having had many further discussions with researchers and clinicians my chosen plan was to investigate the changing aspects of the upper motor neuron syndrome over the first six months post stroke With this in mind in May 2007 I met with Dr Anand Pandyan at Keele University regarding how to progress this interest forward.

The challenge in deciding on a specific research area rather than joining a university through a PhD studentship is that there is no immediate funding. This is why it has taken so long for me to begin the PhD.

For some, writing grant applications is not a concern until after the PhD but I have already written four full applications to different funding bodies. The feedback is sometimes hard to take, particularly when decisions appear politically driven rather than due to sound scientific rationale. Nevertheless it was the biggest grant application that finally came off in November 2009. A National Institute of Health Research, Research for Public Benefit Grant.

Different funding bodies require different approaches to the research methodology. The NIHR grant aims to generate research that will translate in to patient benefit. We therefore developed a double blind randomised controlled trial investigating Botulinum Toxin and electrical stimulation to the forearm extensors as soon as signs of abnormal muscle activity on EMG presented. I will talk in more detail about the trial in further entries but for an overview look on the ISRCTN website number: ISRCTN57435427.

The grant funding however, is only available once a positive ethical opinion has been given. This took a very long time to come as the named principal investigator Steve Sturman (Consultant Neurologist) and I worked for many hours in our spare time on the protocol and ethics forms. Because the trial uses a drug it requires further approval by the MHRA and only certain research ethic committees can hear it.

It was therefore to Manchester in December 2010 that Anand and I travelled to sit and argue our case to a panel of 12 on an ethics committee. They were very positive but advised on a number of changes to patient information and consent sheets before we were given the all-important positive ethical opinion in April 2011. Shortly after this the MHRA agreement came through and we were able to get the grant funding. This allowed me to begin my three year secondment from the NHS as a full time PhD student in July 2011.

I suppose my journey to the start has been a back-packing expedition rather than a relaxed business class flight but I have seen more and encountered far more challenges this way and hopefully it has led to a more rounded and fulfilling experience.

So, from being an experienced clinician I now find myself at the lower end of the pecking order as a PhD student. Not quite student, not quite member of the university staff and not a clinical member of staff in the hospital. It does feel a bit strange but I would not change it. Whether this view changes as I continue is yet to be discovered.

# **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.

### BOOKS

# Physical management for neurological conditions

Third edition

Edited by: Maria Stokes and Emma Stack Churchill Livingstone ISBN 978-0-7234-3560-0

### Review by Elizabeth Hooks Senior

Physiotherapist, Poole Community Therapy Team

This physiotherapy orientated textbook has been refined and includes four new chapters. It is very easy to read, using key points to help the reader summarise and revise what they have read. It comes across with a nonprescriptive approach that strongly encourages a multi-disciplinary and patient-centred way of working. As an overview the book is set out into three main sections.

The first section of the book looks at neurological and neuromuscular conditions. Each chapter explores a different condition; the chapters are well set out, outlining the main points regarding pathology, diagnosis, assessment principles, management and the physiotherapist's role and treatments. This allows the reader to gain a good comprehensive coverage of the basics, and allows them to be well enough informed to manage patients with these conditions. Experienced clinicians may find some of the information a little basic in some areas. However, it is a very good aide-memoire for those areas in which clinicians may not find themselves working on a regular basis.

The second section moves into describing physiotherapeutic approaches, starting with the guiding principles and moving onto summarising the most often used techniques. Vestibular rehabilitation, the management of pain, altered tone, and also neuropsychology are discussed in more detail.

The third section looks at core rehabilitation skills that physiotherapists utilise on a daily basis, allowing the reader to research or revise the most essential facts in the areas of exercise training, self management and falls.

The book appears to be aimed at undergraduates. However, it would be a valuable addition to any department, particularly those supporting rotational staff. It will save time for clinicians who want an overview of different clinical groups, or treatment techniques, without having to trawl through a long literature search.

Finally, the book provides some useful contact details and websites for a variety of associations and support groups, in a well set out appendix. In addition, each chapter is well referenced and where appropriate gives details of additional resources. The publishers also offer a feature called 'pageburst™', which allows you to access the textbook online or through an iPhone. I have tested this feature, but in practice found it failed to load.

### COURSES

### Step into research Wessex ACPIN

An evening lecture was hosted by the Royal Hampshire County Hospital. This took place on Wednesday 21st September 2011 and was called 'Step into Research'. The aim of the evening was to 're-visit' research as a topic for Wessex ACPIN members. Also to support band 5 and 6 physiotherapy staff thinking about research/undertaking research and review what research was happening locally. We tried to format the evening in a slightly different way, so that people attending would be able to `mingle' with presenters at the start of the evening initially and then enjoy the lecture during the middle part of the evening. Time was also available at the end for further interaction with colleagues and guest speakers. We wanted to try this approach to meet the different needs/ level of support/questions from the people attending, rather than a 'traditional' single lecture format.

We also tried to keep the structure of the evening very informal and relaxed. This was done purposefully, so that members were not discouraged from thinking that research was 'only for senior level physiotherapists'. We had representatives from the University of Southampton, South Coast DeNDRon, South Central Stroke Association and Wessex members who had undertaken MSc research volunteered to talk in small groups/answer questions.

The main speaker during the evening was Dr Jane Burridge, a research physiotherapist from the University of Southampton. Dr Burridge talked about the two ends of the research process and explored clinically driven research that leads to effective changes in practice. Wessex ACPIN members were also able to learn about what research, in relation to neurological therapy, is taking place at the University of Southampton. This includes pioneering robotic equipment for upper limb therapy and hand activity.

Wessex ACPIN also supports entry into research and continued professional development with a bi-annual bursary scheme that is available.

![](_page_47_Picture_1.jpeg)

### Physio wins The Royal Society of Medicine's Gordon Holmes Prize for Clinical Neuroscience

![](_page_47_Picture_3.jpeg)

Lisa Bunn has won The Royal Society of Medicine's Gordon Holmes Prize for Clinical Neuroscience for 2012, which is open to all trainees in neurosciences including neurology, neurosurgery, neurophysiology, neuropathology or neuroradiology. As well as the prestige of winning, a financial prize of £300 is awarded.

"I was initially shortlisted based on submission of an abstract of my work in January 2012 (along with four others)". The programme for the night is available on: www.rsm.ac.uk/ academ/cnc05.php Each shortlisted individual had ten minutes to present a very concise but informative account of their work and answer five minutes worth of questions.

The prize was awarded to the project because it was an 'excellent example of translational neuroscience' and the feedback was that the talk was clear and well-paced. Presentations took place during an evening event at the Royal Society of Medicine on March 1st 2012.

Lisa lectured at our ACPIN conference this year presenting on her area of research, 'What is the cause of balance impairment in patients with cerebellar disease'. She is the first physiotherapist to have received this award, with her major competitors being neurologists and neuroscientists. Lisa should be congratulated on this break through and we wish her all the best with her ongoing drive in research to better neurorehabilitation in the future.

### **Interactive CSP update**

*Chris Manning iCSP link moderator for neurology*.

There are 10,140 registered users on the neurology network. The membership is growing by approximately 1,000 each year. This and the growing ACPIN membership demonstrate the high profile neurology has in our profession.

Many of the posted items, discussions, documents and websites, relate to topics covered in the ACPIN national conference, 'The Backbone of Neurology'. Use the discussion forum to carry on debates you may have had at the conference. Keep in touch!

### **Other news**

An update of other ACPIN news can be found in the section on this years conference, the session named, *Speed updates - What does ACPIN Do?* on page 26 of this edition of *Synapse*.

### **ACPIN constitution revised**

### **REVISED CONSTITUTION**

March 2012 (Revised from previous constitution dated November 2008, November 2004 and 17th July 1996)

### 1 TITLE

**1.1** This Clinical Interest Group shall be known as the 'Association of Chartered Physiotherapists in Neurology', herein referred to as ACPIN, or 'The Group'.

### 2 TERMS OF REFERENCE

- **2.1** To promote and facilitate collaborative interaction between ACPIN members across all fields of practice including clinical, research and education.
- 2.2 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.
- **2.3** 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.
- **2.4** To maintain and continue to develop a reciprocal communication process with the Chartered Society of Physiotherapy on all issues related to neurology.
- 2.5 To foster and encourage collaborative working between ACPIN, other professional groups, related organisations ie third sector, government departments and members of the public.
- **2.6** Any other objective not in conflict with 2.1 to 2.5 above which appears to be appropriate to the needs and interests of the members of ACPIN.
- **3 ACPIN** shall not take any action or express any view which in any way affects or concerns the general policy of the Chartered Society of Physiotherapy (CSP) without the express agreement of the Council of the Chartered Society.

### 4 MEMBERSHIP

Membership shall be available upon completion of an application form and payment of the appropriate subscription in the following terms:

- **4.1** Full members shall be registered Chartered Physiotherapists in good standing with the CSP (This section includes CSP members who live overseas).
- **4.2** Associate members shall have a professional interest in neurology and thus, in the opinion of the Executive Committee are suitable to become associate members of ACPIN. Associate members will not have the right to hold any elected post within ACPIN. CSP Support workers whose names appear on the register maintained by the Chartered Society of Physiotherapy shall be eligible for associate membership.
- **4.3** Overseas members shall be qualified Physiotherapists who are members of their country's governing body.
- **4.4** Student members shall be Undergraduate Physiotherapists who are student members of the Chartered Society of Physiotherapy.
- **4.5** Full and Associate members shall have the right to vote.

### 5 REGIONAL STRUCTURE

### 5.1 Application procedure

Applications for full, associate and student membership shall be submitted in the first instance to the membership secretary. A new member will be allocated to one Regional Group, according to the location of his or her place of work or residence in accordance with the map annexed hereto. A member who works or lives close to the boundary of any region may elect to join an adjacent region.

### 5.2 Capitation

Regional Groups shall be entitled to receive a proportion of the annual subscription paid by each member allocated at a level determined by the National Committee. It shall be open to the National Committee to set different levels of local subscription allocations among Regional Groups.

### 5.3 Regional constitutions

Each Regional Group shall adopt a written constitution in accordance with guidelines at Appendix 1 of this constitution. A Regional Group may not amend its own constitution without prior agreement of the National Committee, signed by a resolution passed by a majority of committee members present.

### 6 EXECUTIVE COMMITTEE

### Shall comprise of:

- **6.1** Nine honorary officers, Chair, Vice Chair, Secretary, Treasurer, Membership Secretary, Research Officer, Public Relations Officer, Minute Secretary, Diversity Officer Post, or any others holding office in accordance with Clause 7.2 below.
- **6.2** Not more than four full members elected at the Annual General Meeting (AGM) who shall be entitled to serve as members of the Executive Committee for such period as shall be permitted in the case of an Honorary Officer.
- **6.3** The Executive Committee shall be empowered to co-opt four members to serve in addition to those elected members, should the need arise. The total number of coopted members shall never exceed one third of the total membership of the committee. The Executive Committee hereafter referred to as Executive shall be responsible for the general management of the Group.
- **6.4** If any Executive Committee member fails to attend two-thirds of the yearly total of meetings without good reason, where good reason is decided at the discretion of the majority of the remaining Executive members, their term of office shall be deemed to have lapsed. The vacancy may be filled by the Executive Committee at its discretion.

### 7 THE HONORARY OFFICERS

- 7.1 Only full members shall be eligible for election as Honorary Officers. Any candidate for election as an Honorary Officer must submit a written nomination, countersigned by at least two other full members to the Chair.
- 7.2 The Honorary Officers, whose numbers shall not exceed nine, shall comprise Chair, Secretary, Treasurer, Membership Secretary, Research Officer and Diversity Officer and such other officers that the Executive consider expedient for the efficient management of the affairs of the Group.
- **7.3** Honorary Officers shall be elected by ballot of enfranchised members of the group at the AGM, save and except the Chair, who shall be elected by a ballot of all Executive Committee Members at the first Executive Committee Meeting to be held after the AGM in the year of the Chair's retirement.
- **7.4** Honorary Officers will hold office for two years, and may offer themselves for re-election for not more than three consecutive terms.

(Giving a maximum of six years service). A former Honorary Officer may offer him or herself for first election not less than two years after retirement from any earlier honorary office. An Honorary Officer may transfer from one honorary office to another for the aggregate length of continuous service. An Honorary Officer shall not exceed a period of six years, as set out above. (See exception below for Chair).

- **7.5** The Chair Person must be on the Executive Committee for a minimum of two years prior to becoming Chair for up to a maximum of four years ie two terms with at least one year prior to taking the Chair as Vice Chair.
- **7.6** In normal circumstances the Chair and Secretary shall not retire in the same year as each other.
- **7.7** Retiring Honorary Officers shall leave office at the AGM and newly elected replacements take office immediately, so that the Chair shall hand over office at the first National Committee Meeting following the AGM.
- **7.8** The Office of President shall be occupied by a person suitably qualified and distinguished who has been invited by the Executive Committee for a period not exceeding four years. The President shall be entitled to attend all meetings of the Executive, but shall not have voting rights.
- 7.9 Should any casual vacancy arise among the Honorary Office, except Chair, that vacancy shall be filled by co-option of a suitably qualified member of the Group, who shall hold office until the next AGM. A casual vacancy for the Chair shall be filled by vote of the National Committee as set out above. Any period of office served as a result of the appointment following a casual vacancy shall not count towards the maximum six year period of office for any member of the Executive Committee.
- 7.10 Committee members will hold office for two years and may offer themselves up for re-election for not more than two consecutive terms for a maximum of four years. However, a Committee Member who goes on to hold an Honorary Officer's post can remain in this Honorary post for up to six years, offering themselves up for re-election at two yearly intervals during this period. Thus maximum service on the Executive Committee can total ten years.

### 8 NATIONAL COMMITTEE

**8.1** The National Committee shall consist of the Executive and one Representative elected from each Region. This may be the Regional Chair or the Regional Representative and shall be full members of the Regional Group whom they represent.

### 9 ANNUAL GENERAL MEETING (AGM)

- **9.1** The AGM shall be held in the month of March at a convenient time and place, to be decided by the Executive, providing that no more than 54 weeks shall elapse between AGM's.
- **9.2** Notice of the date, time and place of the AGM shall be given to all members by the Chair not less than 28 clear days in advance. Such notice shall be accompanied by a provisional agenda.
- **9.3** The AGM shall receive reports from the Honorary Officers, consider the accounts, and appoint an Auditor for the following year, hold elections for office and transact such other business as notified to the Secretary in writing not less than 14 days before the said AGM.

### 10 EXTRA-ORDINARY GENERAL MEETING (EGM)

- **10.1** An EGM may be called by the Secretary upon receipt of instructions from the Executive or upon written representation from not less than one third of the fullmembership.
- 10.2 Not less than 28 days clear notice of an EGM shall be given, specify-

ing date, time and place, to all members of the Group. Such notice shall also include an agenda which comprises a full and exhaustive programme for the business which is to be considered at any such meeting.

- 11 VOTING
  - **11.1** All voting at Annual General Meetings or Extraordinary General Meetings shall be by a show of hands. Voting at all Committee Meetings shall be by a show of hands.
  - **11.2** Any full or associate member may appoint another full or associate member to act as his or her proxy at any Annual or Extraordinary General Meeting by giving notice in writing to the Secretary. Such notice specifying whether the said proxy is directed to vote in accordance with the wishes of the members or given discretion in the casting of any vote.
  - **11.3** A National Annual General Meeting or Extraordinary Meeting shall not be deemed quorate unless at least 50 full members, or one third of the total full membership attends, whichever be the less.
  - **11.4** Any other Committee Meeting shall require a quorum of not less than one third of the membership of the Committee.

### 12 WINDING UP / DISSOLUTION

The Group may be wound up by a resolution passed at an Annual or Extraordinary General Meeting supported by a simple majority of full members casting votes. In the event of a motion to wind the Group up being passed the CSP will be informed and entitled to recoup the balance of the year's capitation fees. The remaining assets of the Group shall be handed over to the Members Benevolent Fund of the Chartered Society of Physiotherapy.

### 13 AMENDMENT

This constitution may only be amended by a resolution passed by an Annual or Extraordinary General Meeting of the group provided:

- 13.1 The proposed amendment has been notified to the Secretary in writing and is supported by the signatures of not less than ten full members.
- **13.2** At least 14 clear days notice has been given to each full member of the proposed amendment.
- **13.3** The proposed amendment receives the support of at least two thirds of the votes cast at the relevant meeting.
- **13.4** The amendments must be approved by the PPSD at the Chartered Society of Physiotherapy

### APPENDIX

When formulating a Constitution, Regional Groups shall have regard to the provisions of the National Constitution, and in particular shall adopt the provisions of Articles 1 to 5 thereof.

Regional Groups shall make provision for the election of a Regional Committee not less than one month before each Annual General Meeting of the National Group.

That Committee must include a Regional Representative who shall serve for two years on the National Committee. It is envisaged that each Region will also elect a Secretary and a Treasurer. The same time limits on service on a Regional Committee shall apply as in the case of the National Committee and Executive.

Not less than four meetings should be required to be held each year within normal circumstances.

Amendment to the Constitution shall be at a Regional Annual General Meeting or Extraordinary General Meeting, but shall only take effect when it has been approved by Resolution of the National Executive and by the PPSD at the CSP.

Winding up shall be by resolution of the members, save that if full memberships falls below 10 a Regional Group will be deemed to have been wound up and its remaining members shall be allocated to other convenient group(s).

Regional assets shall pass automatically to the National Group.

A copy of the Constitution of each Regional Group must be supplied to the National Honorary Secretary.

The appropriate provisions of this Constitution may be adopted by Regional Groups by the making of amendments to meet the specific needs of such groups. It is envisaged that each Regional Group will adopt this Constitution subject to such amendments.

# **ARTICLES IN OTHER JOURNALS**

## ARCHIVES PHYSICAL MEDICINE AND REHABILITATION

### Volume 92:10

• Bell KR, Brockway JA Hart T, Whyte J, Sherer M, Fraser RT, Temkin NR and Dikmen SS *Scheduled telephone intervention for traumatic brain injury: a multicenter randomized controlled trial* pp1552–1560.

• Herrmann SD, Snook EM, Kang M, Scott CB, Mack MG, Dompier TP and Ragan BG *Development and validation of a movement and activity in physical space score as a functional outcome measure* pp1652–1658.

• Hirsh AT, Braden AL, Craggs JG and Jensen MP *Psychometric properties of the community integration questionnaire in a heterogeneous sample of adults with physical disability* pp1602-1610.

• Huisinga JM, Filipi ML, Schmid KK and Stergiou N Is there a relationship between fatigue questionnaires and gait mechanics in persons with multiple sclerosis? pp1594–1601.

• Moreno CC, Mendes LA and Lindquist AR *Effects* of treadmill inclination on the gait of individuals with chronic hemiparesis pp1675-1680.

 Norweg A, Ni P, Garshick E, O'Connor G, Wilke K and Jette AM A multidimensional computer adaptive test approach to dyspnea assessment pp1561–1569.

• Selassie AW, Varma A and Saunders LL *Current* trends in venous thromboembolism among persons hospitalized with acute traumatic spinal cord injury: does early access to rehabilitation matter? pp1534–1541.

• Severinsen K, Jakobsen JK, Overgaard K and Andersen H *Normalized muscle strength, aerobic capacity and walking performance in chronic stroke: a population-based study on the potential for endurance and resistance training* pp1663-1668.

• Waters DL, Hale LA, Robertson L, Hale BA and Herbison P *Evaluation of a peer-led falls prevention program for older adults* pp1581-1586.

### Volume 92:10 (Supplement)

• Amtmann D, Cook KF, Johnson KL and Cella D The PROMIS initiative: involvement of rehabilitation stakeholders in development and examples of applications in rehabilitation research ppS12-S19.

• Carlozzi NE, Tulsky DS and Kisala PA *Traumatic* brain injury patient-reported outcome measure: identification of health-related qualityof-life issues relevant to individuals with traumatic brain injury ppS52-S60.

• Cella D, Nowinski C, Peterman A, Victorson D, Miller D, Lai JS and Moy C *The neurology quality-of-life measurement initiative* ppS28-S36.

• Haley SM, Ni P, Lai J-S, Tian F, Coster WJ, Jette AM, Straub D and Cella D *Linking the activity measure for post acute care and the quality of life outcomes in neurological disorders* ppS37-S43.

• Lai JS, Cella D, Choi S, Junghaenel DU, Christodoulou C, Gershon R and Stone A *How item banks and their application can influence measurement practice in rehabilitation medicine: a promise fatigue item bank example* ppS20–S27.

• Quatrano LA and Cruz TH *Future of outcomes measurement: impact on research in medical rehabilitation and neurologic populations* ppS7–S11.

• Tulsky DS, Carlozzi NE and Cella D Advances in outcomes measurement in rehabilitation medicine: current initiatives from the National Institutes of Health and the National Institute on Disability and Rehabilitation Research ppS1–S6.

• Tulsky DS, Kisala PA, Victorson D, Tate D, Heinemann AW, Amtmann D and Cella D *Developing a contemporary patient-reported outcomes measure for spinal cord injury* ppS44–S51.

### Volume 92:11

• de Araújo RC, Lúcio Jr F, Rocha DN, Sono TS and Pinotti M *Effects of intensive arm training with an electromechanical orthosis in chronic stroke patients: a preliminary study* pp1746-1753.

• Barclay-Goddard R, Lix LM, Tate R, Weinberg L and Mayo NE *Health-related quality of life after stroke: does response shift occur in selfperceived physical function*? pp1762-1769. • Conroy SS, Whitall J, Dipietro L, Jones-Lush LM, Zhan M, Finley MA, Wittenberg GF, Krebs HI and Bever CT *Effect of gravity on robot-assisted motor training after chronic stroke: a randomized trial* pp1754–1761.

• Fritz SL, Merlo-Rains AM, Rivers ED, Peters DM, Goodman A, Watson ET, Carmichael BM and McClenaghan BA *An intensive intervention for improving gait, balance and mobility in individuals with chronic incomplete spinal cord injury: a pilot study of activity tolerance and benefits* pp1776-1784.

• Gadidi V, Katz-Leurer M, Carmeli E and Bornstein NM *Long-term outcome poststroke: predictors of activity limitation and participation restriction* pp1802-1808.

• González-Fernández M, Davis C, Molitoris JJ, Newhart M, Leigh R and Hillis AE *Formal education, socioeconomic status and the severity of aphasia after stroke* pp1809–1813.

• Hastings J, Robins H, Griffiths Y and Hamilton C The differences in self-esteem, function and participation between adults with low cervical motor tetraplegia who use power or manual wheelchairs pp1785–1788.

• Jensen MP, Alschuler KN, Smith AE, Verrall AM, Goetz MC and Molton IR *Pain and fatigue in persons with postpolio syndrome: independent effects on functioning* pp1796–1801.

• Kasser SL, Jacobs JV, Foley JT, Cardinal BJ and Maddalozzo GF *A Prospective evaluation of balance, gait and strength to predict falling in women with multiple sclerosis* pp1840– 1846.

 Krause JS and Saunders LL Health, secondary conditions and life expectancy after spinal cord injury pp1770–1775.

• Marchetti GF, Whitney SL, Redfern MS and Furman JM *Factors associated with balance confidence in older adults with health conditions affecting the balance and vestibular system* pp1884-1891.

• Meeus M, van Eupen I, van Baarle E, De Boeck V, Luyckx A, Kos D and Nijs J *Symptom fluctuations and daily physical activity in patients with chronic fatigue syndrome: a case-control study* pp1820-1826.  de Niet M, Latour H, Hendricks H, Geurts AC and Weerdesteyn V Short-latency stretch reflexes do not contribute to premature calf muscle activity during the stance phase of gait in spastic patients pp1833-1839.

• Page SJ, Murray C, Hermann V and Levine P Retention of motor changes in chronic stroke survivors who were administered mental practice pp1741–1745.

### Volume 92:12

• Denkinger MD, Lindemann U, Nicolai S, Igl W, Jamour M and Nikolaus T *Assessing physical activity in inpatient rehabilitation: validity, practicality and sensitivity to change in the physical activity in inpatient rehabilitation assessment* pp2012–2017.

• Fisher SR, Galloway RV, Kuo YF, Graham JE, Ottenbacher KJ, Ostir GV and Goodwin JS *Pilot study examining the association between ambulatory activity and falls among hospitalized older adults* pp2090–2092.

• Hakkennes SJ, Brock K and Hill KD Selection for inpatient rehabilitation after acute stroke: a systematic review of the literature pp2057-2070.

• Hase K, Suzuki E, Matsumoto M, Fujiwara T and Liu M *Effects of therapeutic gait training using a prosthesis and a treadmill for ambulatory patients with hemiparesis* pp1961–1966.

• Oh-Park M, Wang C and Verghese J Stair negotiation time in community-dwelling older adults: normative values and association with functional decline pp2006-2011.

• Sosnoff JJ, Boes MK, Sandroff BM, Socie MJ, Pula JH and Motl RW *Walking and thinking in persons with multiple sclerosis who vary in disability* pp2028–2033.

• Wu CH, Liou TH, Hsiao PL, Lin YC and Chang KH Contribution of ischemic stroke to hip fracture risk and the influence of gender difference pp1987-1991.

### Volume 93:1

• Bird M–L, Hill KD and Fell JW *A* randomized controlled study investigating static and dynamic balance in older adults after training with pilates pp43-49.

• van Bloemendaal M, Kokkeler AM and van de Port IG *The Shuttle Walk Test: A new approach to functional walking capacity measurements for patients after stroke?* pp163-166.

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# **REGIONAL REPORTS**

### **East Anglia**

Nicola Alexander

In East Anglia 2011 saw high membership numbers, well attended and well received courses. Our strong committee now represents the whole of the region and with our new chair Louise Dunthorne at the helm an exciting 2012 course programme has been planned.

At the time of writing the 2012 course programme is as follows:

- 29th June *Connective tissue and myofascial course* at Addenbrookes
- 21st/22nd September Locomotion a two day course, with Helen Lindfield, Bobath Tutor at Ipswich Hospital

Please keep an eye on the ACPIN website for up to date East Anglia ACPIN course information. In a climate where course funding can be difficult, we will continue to keep course costs low in 2012.

As ever, if you would like to enquire about any of our courses, or have any course ideas, please get in touch. I look forward to seeing you at our courses this year.

### Kent

Nikki Guck

My apologies must first be said to the committee for my bad time management in not getting a report to print in time of the last *Synapse*; this should not be seen as a committee failure but my time management.

This past six months has been pretty static for the committee with a very strong team who are always willing to give up time for meetings and organisational duties. We have the largest ever number of ACPIN members in Kent, this is hopefully as a result of the team driving to deliver education programmes that are appropriate to the needs of neurophysiotherapists in the region. We hope that in the future we continue to grow year on year, especially in the challenging financial climates of the NHS and peoples personal circumstances. Because of this we will continue with our study days and try to use local clinicians and facilities to keep the costs low.

We successfully ran in collaboration with the MS Trust an oversubscribed MS study day on 20th September 2011, which generated lots of thought provoking discussions between clinicians regarding research and clinical interventions to manage the patient holistically.

In December 2011 we enjoyed our annual Christmas evening lecture with food and mulled wine with a brilliant lecture from a neurologist to explain/ discuss the pharmacological management in neurological conditions.

The AGM was titled "Mind over Matter".

As this goes to print we are in the process of designing a newsletter which we will upload onto the ACPIN website under the Kent region to allow local staff to be aware of upcoming events and/or allow networking within the region. We have been running a raffle ticket allocation per person that attends our lectures/study days and at the end of the year are offering a free place to the 1-2 day ACPIN national conference which will allow Kent ACPIN members to use some of the money that they have generated.

The Kent committee would like to say a big thank you for your continued support and as usual if you have any suggestions, ideas on courses or any other queries please feel free to contact us on kentacpin@ hotmail.co.uk

### London Andrea Stennett

Happy New Year to you all! We've spent the latter half of 2011 working on the program for 2012. This year is tipped to be a year of great excitement with the Olympics, Paralympics and the Queen's Diamond Jubilee celebrations! Likewise we have an exciting program for you that is geared towards enhancing your knowledge and professional development.

We started the year in February with our AGM and study morning, 'Exploring the neuroscientific basis of neurophysiotherapy' with Dr Margaret Mayston. Thank you Dr Mayston for an informative morning. Other events include two study days with Professor Janice Eng and Professor Sandra Brauer on the 21st of April and 30th of June respectively. Our annual wine and cheese event will be in September this year and our final event will be a study morning showcasing the research of our physiotherapy colleagues in November 2012. Please keep checking our website (www.acpin.net/ London.html) for any changes and details about registration.

As a committee we are well aware of the economic situation facing us at this time and as such we have continued to keep the cost of our study mornings and study days to a minimum. We are able to do this because our courses are usually well attended. In return, this is our way to show our appreciation to you for your continued support.

Our committee bid farewell to one of our long-standing members, Mrs. Sandra Chambers. Sandy we wish you all the best with your future endeavors and thank you for all your hard work and wise words of wisdom over the years to the London Committee. Sandy will still be active on the National ACPIN committee so I'm sure we will see her around. I would like to take this opportunity to inform you that from time to time we will send out emails pertaining to different issues for you to give your thoughts and opinions. So, watch out for these emails. It is important to get your views and ideas on topics that could have an impact on you in your clinical practice.

The Department of Health has recently published the *Allied Health Professionals Referral to Treatment Revised Guide* in December 2011. This may be of interest to you especially if you work in the community. You can view it at www.dh.gov.uk/en/ Publicationsandstatistics/Publications /PublicationsPolicyAndGuidance/ DH 131948.

If you have any ideas for future courses, feedback or general comments please email us at london acpin@googlemail.com

### **Manchester ACPIN**

Stuart McDarby

2011 was another successful year for Manchester ACPIN, with a combination of bi-monthly lectures and a Saturday morning course on 'Management of the neurological shoulder'. This was undoubtedly one of the highlights of the year and received positive feedback from our members.

As with other years, we have aimed to produce another interesting and relevant programme for 2012 and we will continue with a schedule of evening lectures every other month and a two day course in September.

The course in September is presented in conjunction with Merseyside and Yorkshire ACPIN and we are pleased to present the internationally renowned Anne Shumway-Cook. Further information will follow later in the year regarding places but it might be worth pencilling it into your diaries now!

As always we welcome any ideas

on speakers, topics and possible venues and we strive to ensure our programme represents neurological physiotherapy in the 21st century. Once again we would encourage ACPIN members in Lancashire and Cheshire to contact us if they would like information on our programme, or just come along if you fancy it!

Our committee has remained consistent in 2011 with six members. We like to think of ourselves as a small but friendly and approachable bunch and we always welcome any interest in members joining our committee!

Here's to an interesting and thought provoking 2012 and we hope to see you at some of our get togethers!

### Merseyside

Anita Wade-Moulton

Membership stands at 59.

In September 2011 we hosted a lecture on Devics Disease which was very well received and enlightening on the recent developments of this condition from a physiotherapy perspective and its similar presentation to MS. The Walton Neurology Centre is researching with Oxford on the diagnostics and treatment of this condition so was good to hear from the 'horses mouth' what is happening so close to home.

February 21st was the AGM and lecture on 'Respiratory management of the neuromuscular patient'

It is always a good reminder what many of our patients have experienced before they enter the hectic and demanding 'Rehabilitation program'!

See the ACPIN website for our future programme.

In September 2012, on Friday 21st and Saturday 22nd, Merseyside are working with Yorkshire and Manchester ACPIN to host a two day course by the eminent American physiotherapist, Dr Ann Shumway-Cooke! Venue yet to be confirmed, keep yourselves posted on the ACPIN web site.

If you have any suggestions on topics or suggested speakers/course tutors that you would like to be on our program please let us know. Also if you would like the venue to be nearer your base please contact one of the committee. We are aware the venues are often Liverpool based but we are open to other suggestions if it means offering a closer venue to more of our distant members. We are aiming to change some of the venues in our next program of lectures and courses.

Could I remind all Merseyside members to help our committee (and myself as regional representative) to be part of ACPIN and have your say when it comes to replying to emails forwarded on from the National Committee. We do need your feedback and input regarding issues and practice so as to gain an accurate picture from all member's views.

Whilst I am on my begging platform could I also remind all MSc students and those participating in research or interested in doing case studies we need articles for *Synapse*. If you are unsure if your work qualifies or need some advice please contact me and I will point you in the right direction to someone who can help you!

### **North Trent**

Anna Wilkinson

North Trent had a quiet end to last year. On the 31st January 2012, Jane Barton, consultant neuropsychologist gave us a talk on 'Psychological care: what is important and whose responsibility is it?'. We have also planned a joint talk by David Nichols, a podiatrist on neurological rehabilitation and myself on the correction of biomechanics. We are also planning day courses on vestibular rehabilitation and a facilitation and handling day aimed at junior staff.

Keep an eye out for other lectures to be planned for later on in the year. If there are any topics our members want to hear presented, please let us know as we have some spaces later on in the year.

We are also pleased to have four potential new committee members attending our next meeting and look forward to welcoming them.

We look forward to seeing you at our future lectures.

### Northern Ireland ACPIN Dr Jacaui Crosbie

For 2011/12 programme, the committee has again organised a mix of lecture and practical evening events. In the rest of 2012 session we plan to again join with the local AGILE group to run a session on a topic of mutual interest to both of these groups.

We opened the year in October 2011 with an evening demonstration of the Bioness upper and lower limb FES stimulators. This gave members an opportunity to try out the equipment and to discuss clinical implications for patients, with representatives of the company. In November we had a presentation from a local research group based in Queen's University Belfast. Jemma Ennis (School of Psychology) explained the purpose of her PhD study which examined the use of FES for upper limb movements in people with stroke. She had also used tran-

scranial magnetic stimulation to assess the patency of the participants' corticospinal tract. It was interesting to hear that it is thought that FES can act as a primer for this pathway when used 30–40 minutes before active exercise is used by the therapist, thus increasing the potential for reorganisation and improvement in conductivity within the CNS. In January 2012 the session highlighted the importance of nutrition for recovery, with speaker, Glenda Duncan, a dietician at the Regional Acquired Brain Injury Unit in Belfast.

Feedback from some of our members has indicated that the rotational band 5 physiotherapists find the NI ACPIN meetings useful for keeping in touch with neurological rehabilitation. The job situation in NI for newly qualified physiotherapists remains difficult and attending ACPIN meetings is a good way for therapists who are still seeking employment to maintain clinical knowledge and to network.

Our current chair Anne–Marie O'Kane has been successful in gain– ing a promotion. This is taking her to the Northern Board so unfortunately she has had to step down as NI ACPIN Chair. The NI Committee will elect a new Chair for the forthcoming year.

### Oxford ACPIN

Claire Guy

From our committee to all Oxford members, welcome to our report for the Spring edition. Our evening lectures remain the mainstay for Oxford ACPIN with regular attendance over 20 and although the venue tends to be Oxford, we will hope to be sharing these more widely. Please let the committee know your preference on venue location.

We were able to support two successful courses last year, Richard Sealy and Martine Nadler presented 'Neuroplasticity, learning and cognition', sharing their knowledge and using stimulating and fun delegate participation, I would never have thought I would learn to juggle on and neuroplasticity course! The second course was looking at pusher behaviour which was very well attended. Evening lectures are still popular, the research evening was once again a success with four local speakers making short presentations with discussion and the topics were self blood pressure management following stroke or TIA, physiotherapists experiences of activity pacing with chronic pain patients, stroke patients experiences of weekends and gait. Another new topic was neuro linguistic programming (NLP) exploring our communication with patients. The 2012 programme started with Brid Spillane sharing her dissertation topic, and the AGM had a local Paralympian, Nikki Emerson speaking, whose approach to life in a short space of time post SCI is an inspiration.

There may be changes on the committee but it will remain strong and representative. Please let us know ideas for lectures, check frontline and email fliers for dates of sessions and you can always contact me on Claire.guy@buckshealthcare. nhs.uk.

### **Scotland ACPIN**

Gillian Crighton

The AGM was held on 28th April in Perth with a lecture on motor imagery. Further courses organised for 2012 include; 'The neurological hand' in June in Dundee, 'FES' in September in Glasgow and 'Balance' in October in Inverness. Look out for flyers for more details!

If you are interested in joining the Scottish ACPIN committee, please contact myself or the chair Fiona Genney (fiona.genney@nhs.net). We meet four times a year in Perth.

Remember you can apply to us for course funding; up to £250, as long as you have been a member of ACPIN for a year or more. Please apply by email to Fiona, giving the full details of the course. All we ask is that you are prepared to share your learning with other ACPIN members after the course.

If you have any ideas for courses *l* events or would like to share useful websites please do not hesitate to contact me at gilliancrighton @nhs.net

### **South West ACPIN**

Helen Madden

South West ACPIN continues to run well attended evening lectures and courses supported by our large membership. Courses organised over the last six months have included an overview of evidence-based practice with Huntingdon's Disease, a study day alongside the Multiple Sclerosis Trust, and the Devon subgroup held its first event on the latest findings on human anatomy.

Courses planned so far for 2012 include a Parkinson's Disease study day with Bhanu Ramaswamy, an evening lecture on orthotics, and our AGM which will provide an opportunity to look at different technology now in use within physiotherapy practice. Courses will continue to be advertised on our regional page on the ACPIN website, interactive CSP and via email to our members. Places for courses will only be confirmed once a completed application form and payment has been received by the course organiser. Our CPD fund will also be reviewed at the AGM in 2012 as to whether we continue with this, or explore other options in supporting our members with CPD.

Changes within the committee include that Wales have formed their own region as from 2012 so we wish them every success with this. Our Devon subgroup now has a number of people on the committee, so we hope to be organising more events in the Devon/Cornwall area.

Please get in touch with us if you wish to find out more information about being on the committee as we always welcome new members, or ideas/suggestions for future courses.

### Surrey and Borders Emma Jones

Surrey and Borders ACPIN has had a successful 2011. This has included having a healthy membership of over 100, and a varied programme encompassing both evening lectures and practical study days. This was concluded in November with an evening lecture on Intrathecal Baclofen.

2012 has commenced with positively. This has included having a well-attended AGM and an informative and interesting lecture from Claire Ward, a clinical specialist physiotherapist on 'Using the ICF Model to support patient-centred rehabilitation'. This was an interactive and thought provoking session and one attracting a variety of our members.

Please see our regional page on the ACPIN website for our programme. Ongoing events will also be forwarded to Surrey and Borders ACPIN members by email and may be advertised in *frontline* and on the iCSP website, so keep your eyes peeled!

Please do not hesitate to contact me with any queries or suggestions for future programmes on emrob222000@yahoo.co.uk. We look forward to seeing you all at future events!

# Visit the ACPIN website

to apply for or to renew your membership, find out what is happening in your region, download past presentations from ACPIN conferences and much more!

www.acpin.net

### Sussex

Gemma Alder

Welcome to any new and existing members. Thank you to all ACPIN members that have continued to support the running of Sussex ACPIN. The committee will continue to present a combination of study days and evening lectures and endeavour to have these at a number of different locations throughout Sussex.

We have had an inspiring combination of study days and evening lectures thus far including; an informative evening lecture on 'Neglect post brain injury, uncomplicating a complex neurological condition'; followed by a very active study day with Bob Wood tilted 'Dynamic movement screening and functional exercise'. We enjoyed an evening lecture with Margret Hewett on her PhD which focused on 'The experience of TIA patients'. February brought a proactive but warming study day on 'Aquatic physiotherapy in neurological conditions' with Jacqueline Pattman. In March we had our AGM which I was delighted

to present a study day on 'Motor relearning a problem solving approach; theory and applications in neurophysiotherapy for stroke'.

The Sussex committee are grateful to all of the programme speakers for educating and enlightening us.

We have a selection of other events in the pipeline for the rest of 2012. These will include; 'Vestibular rehabilitation – the dizzy patient'; 'A neurorehabilitation Msc journey' and 'The assessment and treatment of apraxia'. More information and confirmation of these courses will be available on the website in the near future.

As always your thoughts and ideas are important to us they really aid us shaping the course format for the following year. Please feel free to contact myself, or any of the committee members to share your ideas.

### **Wales ACPIN**

Adele Griffiths

Wales has formed a new regional ACPIN group under the title of Wales ACPIN during 2011, after many years of being affiliated with the South West ACPIN branch. An informal committee met regularly in 2011 and ran several events, with formal election of officers at the AGM in February 2012. There are currently 66 ACPIN members in Wales and the numbers are growing steadily.

The inaugural meeting of Wales ACPIN was an evening lecture given by Dr Monica Busse–Morris on research developments in Huntingdons Disease. A day course focusing upon 'Pushers' received good feedback and in December a two day practical course in Mid Wales gave participants an opportunity to practice skills in upper limb rehabilitation. The AGM on February 4th in Port Talbot was part of the Winter training day with guest Dr Lori Quinn speaking about motor control.

Wales ACPIN has a WIKISPACE: walesacpin for sharing minutes, information and for members to link up. There are also plans to use WebEx for sharing lectures with those who are unable to attend; increasing opportunity to view lectures and reducing travel costs for members. This initiative has received support from the ACPIN Executive committee for 2012 and if it is successful it may be rolled out to other regions.

The main event planned for 2012 is an exciting three day balance course taught by Anne Schumway Cook and Marjorie Woolacott co-hosted by Cardiff University September 7–9th.

### Wessex

Jenny Barber

The last six months have been very eventful. We have had a mixture of events, from an `ataxia' study day, a `research' evening and also our annual Christmas meal!

Dr Lisa Bunn, from the University of Plymouth, led a study morning on ataxia. This was very well attended and a popular course. We also had an evening that focused on research which reflected what was happening

clinically within our profession. This was led by Dr Jane Burridge, from Southampton University. The evening was supported by the local branch of Dendron, the Stroke Association, information from the MS Trust and local colleagues involved in research (ie experience of working at Masters Level). This was a two part event that allowed members to attend the second part at the University of Southampton campus and see PhD projects, work with robotics and neuro-technology equipment. Our band 6 physiotherapist colleagues from the Southampton and Portsmouth area hosted a joint evening event, where they `shared local practice' by outlining projects that looked in detail at exercise prescription and outcome measures.

Our committee has undergone some changes also. We have a new Chair, Nicola Perkins. Our Regional Representative is now Jenny Barber and Gina Turner is Regional Secretary. We are fortunate to have a large committee (about ten members) and also have a large regional membership (approximately one hundred and five members). We continue to have our bursary, to support members with external courses and professional development. Wessex ACPIN also has strong links with a physiotherapy project in Ghana. We are supporting this project to develop physiotherapy services in the area and enhance the learning experience of our colleagues in Ghana.

In January in Poole there was an event on the commissioning process. In February there was an evening focused on 'neurosurgery' led by a local consultant. Wessex ACPIN committee also met in February. We did not have any regional events planned for March, as our focus was on the national ACPIN conference. In April, we continued our events with an evening 'Psychology' lecture, followed by our AGM. In May, we have a 'Gait' study day planned, led by Anna Gould. We also will be hosting an evening looking at the 'pusher syndrome' later in the year. More information about any of these events can be obtained from emailing at wessexacpinsec @hotmail.co.uk

### West Midlands Cameron Lindsav

ameron Linasay

The West Midlands region continues to increase in numbers (201 members in December 2011). In the last six months we have welcomed Ulrike Uta and Anna Billingham to the regional committee team.

Obtaining study leave to attend a day course during the week has become almost impossible so in December we tried a different format. Our Multiple Sclerosis study event began at 3.00pm and finished at 7.00pm. This allowed people to take a shorter time off work but still allow for an intensive study session.

Interdisciplinary colleagues from both clinical and research areas provided very interesting and thought provoking lectures on areas of fatigue, bladder management, disease modifying drugs and ataxia. Over 70 people attended the study day so given the attendance and the feedback this format is likely to be employed again.

We continue to attempt to get a series of discussion or debate evenings up and running with one or more people advocating for divergent points of view. Our first two topics are stretching and core stability in neuro rehab. The debate is aimed at getting people thinking and perhaps identifying areas of research in a friendly atmosphere however we are struggling to find people willing to advocate for a certain point of view.

At our recent AGM we announced a new initiative to present a bursary to a member of the West Midlands ACPIN region on a bi-annual basis. We wish to express thanks to the Wessex ACPIN committee who have helped us develop the policy. A bursary of £500 will now be awarded in March and September.

We are aware that the committee continues to be made up of people local to Birmingham and would love to hear from people elsewhere in the region who would be willing to join the committee. We would also like to locate upcoming events in different venues around the region so any suggestions would be gratefully received.

# Yorkshire ACPIN

Kirstie Maclaren

Despite weddings and babies, Yorkshire committee have continued to try and offer a varied and interesting programme of events for 2012. Our AGM covered some of the latest updates in MS, Parkinson's, MND, and brain injury as well as volunteering in Bangladesh. Future events for 2012 include Master Classes with Mary Lynch-Ellerington, Neglect, Spasticity Management and hopefully rerunning the popular Ataxia course. Dates and venues are still to be confirmed so please keep watching the ACPIN website for details. Flyers for the courses are also sent to all Yorkshire members via Email so please ensure you have an up to date email registered by checking the website. We also use iCSP and frontline to ensure the details get to as many people as possible.

We are continuing to look at using venues from all around our area and setting up links with venues we have not used before such as Harrogate and possibly Northallerton. If you have a venue that you think would be of use or know of a good speaker or topic that we could use please contact us as we are always happy to listen.

Membership continues to rise in Yorkshire making us one of the biggest and most active groups which we hope to continue throughout the year. We are always on the lookout for more committee members as it's a brilliant way of meeting other like minded physiotherapists in the area and accessing great CPD opportunities as well as being very sociable! If you are interested in finding out more (without being press ganged!) please email me for a chat.

We try to be as interactive as possible so please feel free to email myself at Yorkshireacpin@yahoo.co.uk, or the committee, if you have any questions, suggestions or even complaints as we aim to provide a service that's tailored to the needs of physiotherapists in our area.

Look forward to seeing more of you over the coming few months!

# **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

#### 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 min– utes' 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 Kate Busby at: ksmoff@hotmail.com

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MAY 2012

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