AUTUMN/WINTER 2004

Syn'apse

JOURNAL AND NEWSLETTER OF THE **ASSOCIATION OF CHARTERED PHYSIOTHERAPISTS INTERESTED IN NEUROLOGY**

- The development of a checklist to assist physiotherapists in the evaluation of armrests for the hemiplegic upper extremity
- Should neurological assessment stop at 65?
- A pilot study into the use of cueing strategies in the treatment of Parkinson's Disease
- Effect of a functional electrical stimulator on a patient with decompression sickness

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ACPIN'S AIMS

1. To encourage, promote and facilitate the exchange of ideas between ACPIN members within clinical and educational areas.
2. To promote the educational development of ACPIN members by encouraging the use of evidence-based practice and continuing professional development.
3. To encourage members to participate in research activities and the dissemination of information.
4. To develop and maintain a reciprocal communication process with the Chartered Society of Physiotherapy on all issues related to neurology.
5. To promote networking with related organisations and professional groups and improve the public's perception of neurological physiotherapy.
6. To encourage and participate in the setting of guidelines within appropriate areas of practice.
7. To be financially accountable for all ACPIN funds via the Treasurer and the ACPIN committee.

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From the Chair

Nicola Hancock BSc (Hons) MCSP SRP
ACPIN Chairperson

Welcome to the Autumn 2004 edition of *Synapse* and to my first report as Chair.

Despite my six years of Executive Committee service I still feel something of a novice now that I am in the Chair's seat! However, I have had a very busy and fruitful start to the job and have managed to maintain my enthusiasm for continuing and developing the excellent and dedicated work that goes on both within ACPIN and in the broader neurological physiotherapy community. I feel a definite sense of responsibility to you all!

As this edition goes to press, we are in the final planning stages for our Autumn Conference, 'Hands-On Neurophysiology' which is on Saturday 13th November at Queen's Square, London. This should be an excellent day with a broad range of eminent speakers addressing current relevant issues in physiology. You will find a taster of some speakers' abstracts on page 32 onwards.

We are also well underway with the programme for our Spring 2005 Conference and AGM, which will be on the challenging and seemingly under-addressed issue of 'Pain and Neurodisability.' We will be returning to the Hilton Hotel at Northampton and the date for your 2005 diaries is Saturday 5th March, a little earlier than usual as we have endeavoured to avoid the Easter break. I do hope that many of you will join us, see *Frontline* in January for application details or contact your Regional Representative.

Planning for CSP Congress 2005 has proved more challenging as the Congress Management Executive have yet to finally decide on a format for this event. It is certain that it will not be exactly as in recent years but final details are not available as this goes to press. We would like to remain involved in this event as our members have supported it in large numbers in the past and our programmes have always been very well received, although we would need to be sure that any change of format met our own requirements as well as those of the CSP. Our working title is, 'Cognition, perception and behaviour: complex challenges to rehabilitation' and I will inform you of progress on this as soon as I can.

Many of you are already aware of our continued success with motions at the Annual Representatives Conference over recent years. These motions are usually generated at National ACPIN Meetings and ideas for them have not been formally collated up to this point. I would like to encourage ideas for areas of debate at ARC to come from the wider membership to ensure that issues are as representative and current as possible. If anyone would like to contribute a suggestion please contact Emma Forbes, PRO, before Christmas so that it can be taken forward to our National Meeting in January. A variety of issues can then be discussed before final decisions are made.

Since the last edition of *Synapse*, many neurophysiotherapists have been involved in the consultation process for the *National Service Framework – Long Term Conditions* which is a document that will no doubt have a considerable impact on many of us in our daily practice. I would like to thank those ACPIN members who took part in this process, as usual our representation was strong and significant. Many of you will be aware by now that the publication date for this document has been put back to early 2005. I would love to think that this is due to Central Government needing more time to release the funds required to put the recommendations into practice – but somehow suspect that this may not be the case…

I am sure that you will all have seen the excellent NICE Guidelines for MS physiotherapy booklet. Again, ACPIN members played a key role in its development and thanks go to the Northern group for all the hard work involved in making this document more accessible, relevant and useful to us all. I have also enjoyed regular contact with Jacqueline Stevenson, Physiotherapy Project Manager for the MS Society, about the very exciting research work that has been undertaken with MS Society funding recently. A further, more detailed report will be in our Spring issue.

Our website – www.acpin.net – is presenting us with something of a challenge. Up to now, it has been updated twice yearly, but the Executive Committee recognise that for an ever-changing organisation this is not sufficient. I wish to apologise to those of you who have been logging on and finding out-of-date information and ask you to bear with us as we improve on this situation in the immediate future.

The Regional Committees continue with their hard work and commitment and there have been a huge variety of courses and lectures organised in the past year. Whilst some committees are thriving, some are short of dedicated committee members and a few more offers of help would be much appreciated. Contact your representative if you would like to contribute. Please also ensure that memberships are renewed and do encourage new members from within your working environments to join up and become active members of ACPIN.

I am extremely pleased to inform you that Dr Sue Mawson has agreed to become President of ACPIN in March 2005 as Professor Ray Tallis departs from this role after three years. A more thorough welcome to Sue and a fond farewell to Ray in the next issue…

Finally, I would like to thank the Executive and National Committees for their dedication and hard work so far this year. It is very reassuring to have such a lovely team of people to work with. I would also like to thank those of you who sent me personal messages of support for your kindness.

Best wishes

ADDRESS FOR CORRESPONDENCE
Bell House, School Road, Pockthorpe, King's Lynn, Norfolk PE31 8TE
email nicolahancock@btinternet.com

Neurophysiotherapy – in mind and body

Raymond Tallis MA FRCP, DLitt, FMedSci
ACPIN President

One of the great privileges of being President of ACPIN is that I am able to share with the readers of *Synapse* whatever bee is buzzing in my bonnet. The loudest bee in the Presidential bonnet at present is the mysterious relationship between the body and the mind. ACPIN members will be dismayed to learn that their President has just finished a trilogy of books (being published by Edinburgh University Press), whose main theme is the mystery of human consciousness. In these books I look at the difference between humans and all other living creatures.

In the first volume I put forward a hypothesis as to how humans came to be so utterly different from their nearest animal kin – the higher primates – despite having so much in common with them biologically. I attribute the widening differences between us and chimps to the hand, with its uniquely opposable thumb[1]. In subsequent volumes, I examine the differences between ourselves and the higher primates in more detail. In volume two[2] I examine personal freedom. Volume three[3] deals with knowledge and truth.

Some of you will already be thinking that perhaps I ought to get out more. Even more of you will be wondering what on earth this has got to do with neurophysiotherapy. I will pass over the first and focus on a (tenuous) link between abstract philosophical arguments and everyday practice. Here goes.

We all of us hope that the neurophysiotherapy of the future will be more firmly rooted in neuroscience. We believe that we will be more effective in helping brain-damaged individuals to regain function if we understand how the brain works, how the injured brain recovers and what the drivers to recovery are. Notwithstanding the increasing amount of research that is being carried out on human beings, using non-invasive techniques such as neuro-imaging, our fundamental concepts of brain function are based upon animal experiments. Without such experimentation, we should not have any idea of, for example, the role played by vestibulo-spinal pathways in maintaining the tone which is the necessary background of voluntary movement; or the role of the central pattern generators in maintaining reciprocal activity of the lower limb muscles in walking. There is however a massive gap between animals and humans which become particularly obvious when we think of voluntary activity – the very kind of activity that our patients want to regain.

If we look at the nervous system from the standpoint of a neuro-scientist, we are unable to find anything in it to explain the deliberate reason-led, voluntary activity that characterises human beings. This had led some neuro-scientists to deny that there is any difference between unchosen neural activity and those actions that seem to us to be voluntary. Once such thinker is Professor Colin Blakemore.

Professor Blakemore is a pre-eminent physiologist who has done as much as anyone to help us to see the extent to which the brain is plastic, and to understand the underlying mechanisms of plasticity. In short, he has been a key figure in the neuro-science revolution of the last few decades that has given us such hope of new approaches to rehabilitation. He should therefore be listened to with respect. Consider, then, these passages from one of his popular books on neuroscience:

> *'All our actions are products of the activity of our brains. It seems to me to make no sense (in scientific terms) to try to distinguish sharply between acts that result from conscious intention and those that result from our reflexes or are caused by disease or damage to the brain.'*[4]
>
> *'We feel ourselves usually to be in control of our actions, but that feeling is itself a product of our brain, whose machinery has been designed, on the basis of its functional utility, by means of natural selection.'* (Ibid, p 270)
>
> *'To choose a spouse, a job, a religious creed – or even to choose to rob a bank – is the peak of a causal chain that runs back to the origin of life and down to the nature of atoms and molecules.'* (Ibid p 272)

In other words, from the viewpoint of the neuroscience that underpins the neurophysiotherapy of the future, there is nothing corresponding to free will or to truly voluntary activity. It seems almost as if (to take an example from one of my own areas of clinical interest), there are no grounds for distinguishing between having an epileptic fit, consulting one's doctor about the fit, and writing a paper on the management of epilepsy.

None of us really believes this. I think I am free (to some extent) and I think you are free. After all, we believe we have responsibility for our actions and we judge others, and expect to be judged ourselves, as if we were the authors of our behaviour. There is therefore a huge gulf between what neuroscience can tell us about the brain – which describes it as a variety of involuntary mechanisms – and what we feel that we truly are, namely conscious human beings engaged in deliberate activity. We might characterise this as the gap between neuroscience mechanisms and human agency.

Mechanism and agency – things that happen in my body or brain v things that I do – may be profoundly different. However they interact in many complex ways. When I deliberately reach out for a cup (say to demonstrate to you that I can do it), the action is voluntary but it is made up of many involuntary components. For example: the control of the velocity of the arm (so that my hand slows down as I approach the glass), the ballistic phase, while the arm is at cruising speed and most mysterious of all, the regulation of the hand aperture which ensures that, by the time I arrive at the glass, my hand is open precisely wide enough to accommodate the glass.

There can be even more complex interactions between neural mechanisms and personal agency. Suppose I execute a brilliant catch on the cricket field. In order to so, I have to fling myself into space in such a way as to intercept the ball at the right moment in its trajectory and I then have to make sure that my hand interacts with it in the right sequence so that the ball gets in the palm of my hand (fingers open) and is imprisoned there once it has arrived (smart closure of fingers). These are things that I could not do voluntarily. Indeed really brilliant fielders, usually find they have caught a ball before they really thought about it. The reason they can do it mechanically, however, is because they have spent much time practising (voluntarily), deliberately setting aside time to do so, travelling to the Cricket School.

Voluntary action then, is built out of mechanisms; and mechanisms can be refined and honed by voluntary activity as in deliberate practicing. This indicates two strategies for neurophysiotherapy: bottom-up approaches which are neurophysio-logically based, and address underlying mechanisms and perhaps require less in the way of active engagement by the patient and top-down approaches, through understanding and conversation and deliberate effort and undertaken with goals clearly in mind.

It is because we need these twin approaches that physiotherapy is so complex. It is no good seeing the patient as a brain and spinal cord within a skull of vertical columns. That is why therapists will never be replaced by machines, even when we have the most complete understanding of the neural and other drivers to recovery.

Which is just a round about way of saying that the therapists of the future will still be at the centre of rehabilitation, whatever clever devices – exercise robots, stem cells, neurotrophic factors – we invent in the future. For we need an approach that integrates our understanding of the brain, rooted in neuroscience, with our understanding of people, which takes us beyond neuroscience.

Now I really must get out more!

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The development of a checklist

to assist physiotherapists in the evaluation of armrests for the hemiplegic upper extremity

Tracey Howard MCSP BSc (Hons) Dissertation completed as an undergraduate at the University of Hertfordshire. Currently working at Dorset County Hospital.

Heather Thornton MBA, PGCE, MCSP, SRP, Senior physiotherapy lecturer at the University of Hertfordshire.

ABSTRACT

Stroke can cause shoulder complications such as subluxation (Zorowitz et al 1996), pain (Culham et al 1995) and a loss of range of motion (Andrews and Bohannon 1989). One method of trying to prevent this is the use of armrests. The aim of the study was to develop a checklist to aid physiotherapists in their clinical decision-making when prescribing the use of an armrest. The checklist was developed from the literature. A questionnaire was sent to 76 neurological physiotherapists in the London area to assess the validity of the characteristics chosen for the checklist. Thirteen respondents, with experience of armrests, replied. The results were analysed using percentages and placed in rank order. Of the 26 characteristics 16 achieved over 90% agreement whilst only two did not achieve 75% agreement. The checklist could be developed further, in light of these results, to provide a tool to aid clinical decision-making when providing armrests for hemiplegic patients.

INTRODUCTION

The glenohumeral joint may become susceptible to complications as a result of a stroke, such as subluxation (Zorowitz et al 1996), pain (Culham et al 1995) and a loss of range of motion (Andrews and Bohannon 1989). These complications may prevent the patient's full participation in their rehabilitation and result in the achievement of a poor upper limb outcome (Dean et al 2000). Physiotherapists try to prevent these complications by treatment and the use of adjuncts such as slings, armrests, taping and functional electrical stimulation.

There is a limited amount of literature on the use of armrests for stroke patients. Benefits of using armrests, cited in the literature, include the reduction of subluxation (Moodie et al 1986), positioning of the upper extremity to discourage spasticity (Zorowitz et al 1995) and placing the upper extremity in the patient's visual field (Bobath 1990). This study proposes to develop an initial checklist that will help to identify armrest characteristics. This could be utilised by physiotherapists to support their clinical decision-making. The checklist could be used in future practice to evaluate armrests on a more objective basis.

METHOD AND STATISTICAL ANALYSIS

A literature review was conducted using Medline database from 1991 to 2001. Searches were carried out for arm slings, armrests and shoulder complications of stroke patients, and the original articles to which they referred were also used. This led to the development of a 26-itemed checklist (see *Figure 1* overleaf). The checklist and an accompanying questionnaire were administered to a total of 76 physiotherapists in the London region (50 randomly selected from the ACPIN database and 26 known users of armrests). The criteria for participation were as follows:

1. Superintendent, Senior I or Senior II physiotherapist
2. A neurological physiotherapist for three or more years
3. Used an armrest for the hemiplegic upper extremity for ten or more patients.

The criteria were set to ensure that the respondents had a high level of knowledge in the use armrests. Only physiotherapists who could meet all three of the criteria were asked to complete the questionnaire regarding the checklists content and layout. The questionnaire used a closed question to see if the checklist characteristics were 'appropriate', 'not sure' or 'inappropriate'. Characteristics were put into a ranked order of appropriateness using a scoring system of: 3 for appropriate, 2 for not sure and 1 for inappropriate.

Open questions were used to gain comments on the reasons for characteristics to be seen as inappropriate, additional characteristics that could be added and the layout of the checklist. The Ethical Committee of the University of Hertfordshire granted permission for the study to take place.

RESULTS

14 respondents fulfilled the criteria, although only 13 completed the question on the appropriateness of the characteristics (the other respondent was uncertain of the terms appropriate and inappropriate). The results are shown as the percentage of agreement and have been put into a ranked order. The results, shown in *Figure 2*, show that there was 90% or over agreement on 16 of the characteristics and only two characteristics received less than 75% agreement.

Additional characteristics that were suggested include the ease of application by staff (tools/time/skill), overall function and posture of the patient in the chair, adaptability to the individual patient (eg for pressure relief and swelling) and one respondent thought it would be useful to include a wheelchair/seating assess-

Figure 1

ARMREST CHECKLIST

NAME/DESCRIPTION OF ARMREST

POSITIVE CHARACTERISTICS

1 = disagree strongly 2 = disagree 3 = agree 4 = agree strongly

		1	2	3	4
POSITIONING					
1	Supports humeral head in glenoid fossa				
2	Permits humeral abduction				
3	Encourages humeral lateral rotation				
4	Allows elbow extension				
5	Assists in positioning the wrist in neutral or some extension				
6	Assists finger abduction				
7	Encourages scapula protraction and rotation				
FUNCTION					
8	Unobstructed hand function				
9	Allows upper extremity activities				
10	Permits passive or active range of motion of the upper extremity				
11	Maintains arm position when posture has changed in chair by patient				
12	Increases body awareness				
WEAR					
13	Distributes weight evenly				
14	Measures taken to avoid pressure sores				
15	Minimises oedema				
16	Easy to apply, remove and adjust				
MISCELLANEOUS					
17	Cosmetic appeal				
18	Easy to clean				
19	Low cost				

NEGATIVE CHARACTERISTICS

4 = disagree strongly 3 = disagree 2 = agree 1 = agree strongly

		1	2	3	4
UNDESIRABLE CHARACTERISTICS					
20	Encourages spastic flexion synergies				
21	Interferes with body image				
22	Reduces sensory feedback				
23	Immobilises arm				
24	Reduces patient's ability to propel wheelchair				
25	Interferes with patient's ability to perform independent transfers				
26	Increases width of chair, causing difficulties going through doorways				

TOTAL SCORE (The higher the score the more effective the armrest has been evaluated to be)

Overall comment about armrest

Date of evaluation

Evaluation by

ment. Comments about the content and layout were also made. The scoring system was criticised and it was thought that the options 'agree' and 'disagree' should be replaced with 'achieved' and 'not achieved' and also the headings positive and negative should be removed and scored separately. It was commented that the checklist was easy to use, but the length of the positioning section was a bit long. One respondent commented that the checklist should be tailored to the individual, the author suggests a column titled 'relevant to the patient' should therefore be included.

RESULTS

Characteristic	Score	% of max score	Ranking
Assists in positioning the wrist in neutral or some extension	39	100	1
Minimises oedema	39	100	1
Easy to apply, remove and adjust	39	100	1
Easy to clean	39	100	1
Encourages humeral lateral rotation	38	97.4	5
Permits humeral abduction	37	94.9	6
Permits passive or active range of motion of upper extremity	37	94.9	6
Increases body awareness	37	94.9	6
Measures taken to avoid pressure sores	37	94.9	6
*Reduces sensory feedback	37	94.9	6
*Interferes with patients ability to perform independent transfers	37	94.9	6
*Increases width of chair, causing difficulties going through doorways	37	94.9	6
Supports humeral head in glenoid fossa	36	92.3	13
Unobstructed hand function	36	92.3	13
Allows upper extremity activities	36	92.3	13
Low cost	36	92.3	13
Distributes weight evenly	35	89.7	17
Cosmetic appeal	35	89.7	17
*Immobilises arm	35	89.7	17
Assists finger abduction	34	87.2	20
Encourages scapula protraction and rotation	34	87.2	20
*Encourages spastic flexion synergies	34	87.2	20
*Interferes with body image	34	87.2	20
*Reduces patient's ability to propel wheelchair	33	84.6	24
Maintains arm position when posture has changed in chair by patient	29	74.4	25
Allows elbow extension	28	71.8	26

* negative characteristic

Figure 2

DISCUSSION

Of the twenty-six characteristics, four scored 100% and sixteen achieved over 90% agreement. Only two characteristics received less than 75% agreement. In this brief discussion I will discuss some of the lower ranked characteristics and the four characteristics ranked first.

The characteristic ranked 26th, 'allowing elbow extension', was considered inappropriate because an armrest places the arm in a degree of flexion, this characteristic may be more appropriate for slings.

The characteristic ranked 25th, 'maintains arm position when posture has changed in chair by patient', was seen to be inappropriate because armrests are not believed to be able to do this and the patient should be repositioned or encouraged to do it themselves. Brooke et al (1991) and Spaulding (1999) suggest the inability of the armrest to maintain alignment of the upper extremity once the patient's position has changed is a major criticism of armrests.

The characteristic ranked 24th, 'reduces the patients ability to propel the wheelchair', had two respondents stating that they did not provide self-propelling wheelchairs to patients during early rehabilitation. The characteristic was suggested by Petrone and Maser (1987) who thought that it was a problem with arm boards, but without mentioning which stage of rehabilitation patients are able to self-propel. This characteristic may be more appropriate for patients who become wheelchair dependent or for those who begin to make recovery in the upper limb but still need an armrest.

The characteristic of 'encourages spastic flexion synergies' was suggested by respondents to be incorrect as they felt that it is more likely as a result of the patients overall position. Three authors suggested this characteristic, however, they were not specifically referring to armrests. Robins (1969) was referring to slings, Spaulding (1999) investigated arm supports but specifically criticised slings for this characteristic and Zorowitz et al (1995) discussed arm supports in general. Therefore this characteristic may be more suitable to apply to slings.

As I did not request respondents opinions as to why characteristics were appropriate I can only discuss why authors thought they were important. I will therefore discuss the four characteristics ranked first. Applebaum et al (1996) suggested that the wrist is important for functional tasks, such as grip, and therefore the range of movement should be maintained by positioning the wrist in neutral or some extension. Wilson and Caldwell (1978) suggested that oedema is a problem and if not prevented it may lead to wrist and hand contractures, therefore, efforts should be made to minimise it. Petrone and Maser (1987) suggested that armrests need to be easy to apply, remove and adjust by the patient, family or staff to allow the patient to do their exercises, for dressing, toileting or transfers or if the armrest is uncomfortable. The same authors also suggested that an armrest should be easy to clean for hygiene and cosmetic reasons.

Additional characteristics that were suggested could be included in a future checklist but would need to be validated first.

Benefit to the physiotherapy profession

The checklist has identified characteristics that physiotherapists should be aware of when using armrests. It has provided an initial checklist to aid clinical decision-making. It could be developed further to provide a tool to evaluate armrests enabling the decision making of armrest prescription to become more objective and evidence based.

Limitations of the study

Only a small sample of physiotherapists was used due to the low response rate, and they were all from the London region, this may have introduced bias.

CONCLUSION

Common complications of the shoulder caused by a stroke include subluxation, pain and a loss of range of motion. Armrests are suggested in the literature to aid the reduction of subluxation, positioning of the upper extremity to discourage spasticity and for the upper extremity to be placed in the visual field. A checklist was developed based on a literature review and was sent to neurological physiotherapists in the London area to validate the characteristics chosen. The respondents also made comments about additional characteristics that could be included, and on the content and layout of the checklist and justified why some characteristics were considered inappropriate. The checklist provides an aid for clinical decision-making and could be redesigned based on the results, and then used as a tool to evaluate armrests.

ACKNOWLEDGEMENTS

This work was undertaken as my dissertation whilst a student at the University of Hertfordshire so I would like to thank all the members of staff for their assistance. I would also like to thank all of the ACPIN members who completed the questionnaire.

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Should neurological assessment stop at 65?

a case report

Joanna Kileff BSc (Hons), MSc, MCSP, SRP Senior Physiotherapist,
Southampton City PCT,
Snowdon Rehabilitation Centre
Lyndhurst Road, Ashurst,
Southampton SO40 7AR
Tel 02380 291006

BACKGROUND

Ninety-two per cent of patients who suffer a stroke are over the age of 65 years and in many hospitals these will be admitted to elderly care wards (The Stroke Association, 1996). There are an increasing number of stroke units being set up over the country to try to improve services for these individuals following a stroke.

In this age group, patients are mobilised as soon as possible due to the risks of being immobile in the elderly (Selikson, Damus and Hamerman, 1988). These risks include loss of bone and muscular strength, range of movement, development of pressure sores or deterioration of the respiratory system. Physiotherapists working on the elderly care wards are commonly generic physiotherapists, and as such need to maintain a breadth of clinical skills including neurological, respiratory, rheumatological and orthopaedic. Due to the multipathologies often encountered in the elderly population, a functional approach is often taken to patient treatment (Foto, 1996). This case report questions whether the generic approach is always the best method of treatment for older patients with neurological impairment.

CASE HISTORY

A 74 year-old gentleman was admitted to an elderly care ward in May 2000 with a left cerebral infarct. He was previously fit and independent in all activities of daily living, with no past neurological history.

On initial assessment he had right-sided weakness, dysarthria and expressive dysphasia. The patient's main problems were the need to use his left upper limb in order to maintain balance while standing and walking. He supported his limb on a table or walked by using the furniture. He was also unable to clear his right foot on the swing phase of gait. Baseline assessments attempted with the five metre walk test (Van Herk, Arendzen and Risperis, 1998) and the 'Timed Up and Go' (Podsialo and Richardson, 1991) were unachievable because of a lack of control in his trunk and right leg.

The patient's own goals were to walk as soon as possible. He was well motivated and insisted on transferring independently on the ward and stepping around his bed space using the bed to lean on. Due to the determination of the patient regarding his own goals and his age, a functional approach to treatment was initially chosen consisting solely of functional activities. This included working on his sitting and standing balance and trying to achieve single leg stance.

After two weeks of daily intervention for thirty minutes a session, it was observed by his physiotherapist that no improvement in function had occurred. The patient was still unable to stand unsupported or walk. It was therefore decided that a more comprehensive and detailed assessment was required.

Reassessment was very specific, trying to elicit problems at an impairment level, rather than at an activity level (WHO Classification). This revealed a more specific problem of poor core stability, (an inability to be stable in the centre of your body to allow arm and leg movement (Richardson and Jull, 1995)). Based on these findings it was decided to treat the patient by addressing the specific impairments that a more comprehensive assessment had revealed.

Treatment continued over the next two weeks, daily as before for thirty minutes at a time. It comprised specific lower limb activity in supine and side lying, with particular focus on maintaining pelvic alignment ie keeping his pelvis in one position whilst moving his legs or arms. This addressed his core stability, specifically his transversus abdominus and multifidus muscles. By retraining core stability it was hoped to free up the arms and legs to allow the patient better functional capacity, with the legs and arms no longer being used to stabilise the body. The treatment was progressed into sitting. Within three treatment sessions the patient was able to walk with no support from his upper limb or an aid, and no longer caught his foot on the swing phase of gait.

At this stage the initial assessment measures were re-measured. From being unable to complete any of the tasks, this patient achieved the 'Timed Up and Go' in 27 seconds and was able to perform a ten metre walk test in just 23 seconds, reflecting a significant clinical improvement from baseline.

REFLECTION

Although natural recovery cannot be eliminated and is ongoing, it would appear that the change of treatment approach and the specific intervention used had a direct and positive effect on the patients' problems.

Traditionally a functional approach to intervention is frequently used with elderly patients. This case report demonstrates that a comprehensive assessment is paramount, to highlight both specific neurological and functional impairments. We would suggest that such assessment would promote the best functional outcome for the patient. Based on our experience and the evidence from this case study, we would suggest that this should occur regardless of the age of the patient, if they are fit and well prior to their stroke. It is acknowledged that other pathologies may require different approaches to their treatment.

This case study also highlights the importance of continual reassessment rather than waiting for two weeks to discover that things are not improving. The use of objective baseline measures ensured the lack of change was observed and the need for re-evaluation of the treatment programme.

The pressures of limited time and resources often result in relatively quick assessments to ensure patients are mobilised as soon as possible. However, this case study demonstrates that time spent on an initial assessment to identify specific problems could result in more efficient use of physiotherapy resources and greater health gain in the longer term.

ACKNOWLEDGEMENTS

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Cueing strategies in the treatment of Parkinson's disease

as reported by members of ACPIN – a pilot study into their use

David Adams MCSP SRP

Louise Gilbert MSc MCSP SRP
Clinical Specialist in Neurology,
Lewisham Hospital Trust.
(formerly Senior Lecturer at the
University of East London.)

BACKGROUND

Parkinson's disease is an incurable condition that affects the basal ganglia, and results in progressive deficits of voluntary and automatic movement control. Medical treatments may reduce its progression but become less effective over time. By the late stages, active function is severely curtailed (Morris, 2000). Clinical presentation is characterised by control deficits such as tremor at rest, bradykinesia, rigidity, hypokinesia, 'freezing' and difficulty in attempting simultaneous tasks. With disease progression there is increasingly flexed posture, development of festinating gait pattern and an increased risk of falls. The maintenance of optimal movement capacity is therefore a priority for these patients (Morris, 2000).

Plant et al (2001) suggest that early physiotherapy referral might delay the onset of PD related problems. Morris (2000) recommends core physiotherapy practice focused on gait, transfers, reach, goal-related functional activities, fall prevention and cardiovascular programmes. *The Guidelines for Physiotherapy Practise in Parkinson's Disease* (Plant et al, 2001) suggest that provision of visual, auditory, and proprioceptive (external) and cognitive (internal) cues may help patients to compensate for their movement deficits through non-automated, attentional pathways (Morris et al, 1995). A search of the literature used to develop these guidelines suggested that evidence-based cueing theory had been determined under experimentally controlled conditions, with auditory and visual cueing more researched than other methods. An extended search showed that proprioceptive and cognitive cueing practises were particularly difficult to define and research whilst many studies employed mixed cueing practice.

AIMS OF THE STUDY

The use of cueing techniques in the treatment of people with Parkinson's Disease is not well-established. The aims of this pilot study were to explore:

- How physiotherapists used cueing techniques in clinical practice;
- How use of cueing techniques varied with early, middle and late stages of Parkinson's disease (see *Appendix I*: PD stage classification) and
- Whether clinical practice was informed by current guidelines, research and evidence-based practice.

METHOD

A postal questionnaire was designed specifically for this study. The questionnaire was divided into three sections. Part A sought the respondent's grade, their years of experience in neurological rehabilitation, area of speciality and how frequently they had worked with PD patients in the previous twelve months. Part B sought respondent use of visual, auditory, cognitive and proprioceptive cueing with patients in early, middle and late stages of PD, the levels of benefit obtained and the likely use of taught cueing methods beyond a clinical setting. Part C sought any outcome measures, guidelines or protocols used with cued treatment techniques.

Patients were to be categorised as early, middle or late PD. Cueing techniques were categorised as published by Plant et al, (2001) as auditory, visual, proprioceptive and cognitive. All questions were prefaced with brief explanatory and instructional headings.

The questionnaire employed closed questions, pre-clarified to obtain specific information for Part A. Closed questions were also utilised, using a five-point rating scale typically ranging from 'very often' to 'never' (Hicks, 1999) as a subjective measure of frequency of client groups, techniques employed, and perceived benefits. Open questions were also utilised which sought new information and allowed qualitative insight into the use of cueing techniques in practice. A covering letter was included, explaining the research question and ensuring anonymity. A self-addressed pre-paid envelope was added. No reminder letters were sent.

Respondents

Physiotherapists were selected from the Association of Chartered Physiotherapists in Neurology (ACPIN) database. Questionnaires (n 100) were sent to all those on the list supplied. It was hoped that the random list selection criteria applied by ACPIN would obtain a representative spread of clinical experience and specialities among those who had an interest in the treatment of PD.

Analysis

Closed question data was checked, collated and compiled into a spreadsheet using *Microsoft Excel* (2000). Individual responses were analysed for plausibility, reliability and consistency by all the research team. Overall data fields were analysed for any observable differences, trends or themes within the data fields (Hicks, 1999).

Content analysis was performed on open question responses to indentify themes which were then subject to analyst triangulation (Mulhall, 2000).

RESULTS

Of the 100 questionnaires sent out, 46 were returned. 37 questionnaires qualified for analysis, 2 were spoilt and 7 respondents saw no PD patients. Physiotherapists surveyed had an average experience of 8.3 years in neurological physiotherapy practice (57% had more than five years of such experience) and 75% were of Senior I or higher grade.

Figure 1 shows the current practice setting of respondents. Most therapists treated PD patients 'occasionally' (38%) or 'sometimes' (35%). Only 16% saw PD patients 'often' and 11% saw PD patients 'very often'. 81% of therapists reported that they assessed 'some' or 'no' early stage patients. Therapists reported that half or more of their clinical caseload were middle stage (51%) and late stage (45%) patients.

THE PRACTICE SETTINGS OF QUALIFYING PHYSIOTHERAPISTS

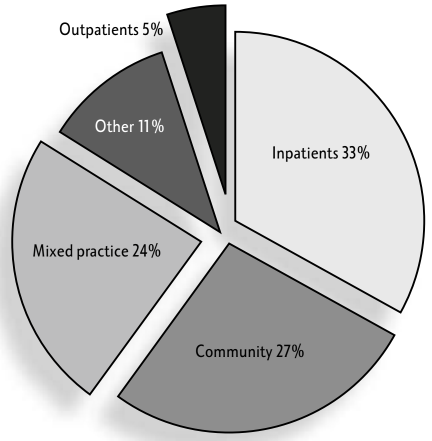

Figure 1

CUEING STRATEGIES

Cueing strategies were widely used by therapists. Auditory, visual, proprioceptive and cognitive cueing were used by 95%, 86%, 86% and 57% of respondents respectively. Hence, there were a number of therapists who did not use particular cueing strategies. *Table 1* shows the therapists' use of cueing strategies for early, middle and late stages of PD.

Therapists were invited to give their opinion on the benefits of cueing strategies for early, middle and late stages of PD. The results were broadly commensurate with use. *Figure 2* shows the percentage of respondents who reported that cueing strategies were often or very often beneficial for patients in early, middle and late PD.

THERAPISTS' USE (%) OF CUEING STRATEGIES FOR EARLY, MIDDLE AND LATE STAGES OF PD

Therapists who did not use each cueing strategy are included in the percentage calculations.

Cueing strategy	Disease stage	Used seldom/ hardly ever	Used sometimes	Used often/ very often
Auditory	Early	29	22	30
	Middle	14	27	54
	Late	16	19	60
Visual	Early	54	13	3
	Middle	18	46	22
	Late	29	27	27
Proprioceptive	Early	38	27	8
	Middle	19	27	37
	Late	11	24	48
Cognitive	Early	24	14	8
	Middle	22	19	13
	Late	24	19	11

Table 1

Overall, auditory cueing was the preferred method of cueing, particularly for the few early stage patients seen. For middle and late stage patients, auditory and proprioceptive cueing were perceived to be beneficial. Cognitive cueing was not perceived to be of benefit by the majority of respondents.

THE % OF THERAPISTS WHO REPORTED THAT CUEING STRATEGIES WERE 'OFTEN' OR 'VERY OFTEN' BENEFICIAL FOR PATIENTS IN EARLY, MIDDLE AND LATE STAGES OF PD

Cueing methods used:
A = Auditory; **V** = Visual; **P** = Proprioceptive; **C** = Cognitive

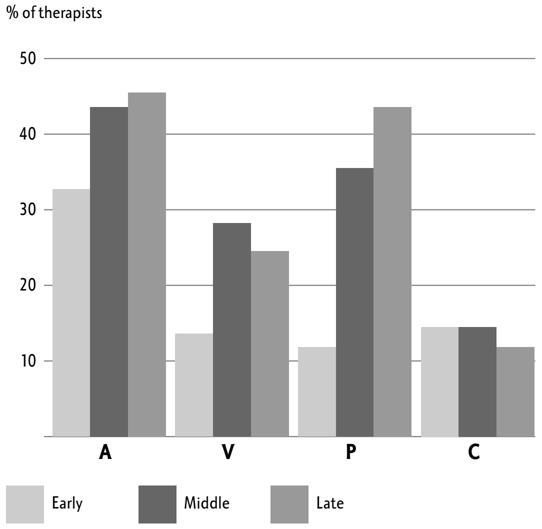

Figure 2

Auditory cueing methods

The three most frequently cited auditory cueing methods at 50%, 24% and 20% respectively were simple counting (eg 'one-two'), simple reciting (eg 'left-right') and non-mechanical auditory pacing (eg stamping, beating or clapping). These methods were used in gait treatments (57%), or to circumvent unspecified problems with initiation and/or freezing (34%).

Visual cueing methods

Visual cueing methods used most often included stepping around or over objects (47%) or patterned or coloured floor markers (28%). These were utilised to decrease incidents of akinesia and freezing (34%) and to improve gait pattern, notably step length (32%).

Proprioceptive cueing methods

The principal methods used by therapists were verbally prompted rocking (38%) or stepping back prior to moving forwards (27%) and facilitation of movement through manual handling (23%), including trunk rotation and arm swing (in most cases, it was unclear whether these were also verbally prompted). Most (41%) used proprioceptive cueing to help with movement initiation, to improve gait pattern (28%) or overcome freezing (24%).

Cognitive cueing methods

Almost half of those who used cognitive cueing (44%) used forms of mental rehearsal. 30% used memorising techniques and 26% described movement subsequencing. Interestingly the aims of cognitive cueing methods were to assist functional activities, mainly transfers (23%) and bed mobility (20%).

UTILISATION OF CUEING METHODS OUTSIDE THE CLINICAL SETTING

In response to questioning about the likely use of cueing methods outside the clinical setting, 25% of respondents felt that 'some' patients with early stage PD were likely to utilise cueing beyond the clinical setting, and 21% considered 'most' patients would. Therapists' reasons for non-use of cueing methods by patients were that patients in the early stage were 'not aware of potential problems' or 'did not want to look odd using cues in public'. In additional comments about this question, some therapists expressed doubt about the need for cueing techniques in the early stages of disease but one thought it 'easier for … early PD to utilise the cueing methods as a preventative measure and positive impact'.

More therapists (70%) believed that 'some' or 'about half' of middle stage patients would use cueing techniques. Patients in the middle stage were described as 'better at self- management than late patients' and 'more likely to utilise and more able to gain benefit' from cueing strategies.

Notably, 25% of therapists reported that 'very few' patients during late stage PD were likely to utilise cueing methods outside the clinical setting. Therapist comments included: 'Late stage patients may cope well with the support of someone else – but very few/none have the capacity to employ any strategy independently' and 'Late stage patients are likely to be less mobile and may have cognitive impairments'. Other reasons given were 'difficulty in multi-tasking' and 'poor motivation'.

USE OF OUTCOME MEASURES AND GUIDELINES

The timed ten metres walk was the most commonly used measure (used by 61%). Other measures included 180°/360° Turn Tests (36%), Timed Up and Go (36%), Berg Balance (31%), TUSS (28%), Elderly Mobility Scale (28%) and FIM/FAM (22%).

The majority of respondents (59%) had not heard of the *The Guidelines for Physiotherapy Practise in Parkinson's Disease*. Of those who had, just over a third (35%) had read them. Only 13% used PD protocols in their department.

DISCUSSION

Due to the small sample (n 37) of qualifying respondents the findings cannot be generalised to ACPIN physiotherapists or PD physiotherapy as a whole. The low return rate (46%) may result from failure to send a reminder letter (Hicks, 1999) and inaccurate targeting of the ACPIN database.

Within the returns, respondent seniority, experience and widespread practice categories lend some credibility to this limited data as a representative sample of expert clinical opinion among ACPIN members. It may be of note that early stage PD patients were poorly represented in the caseload of most respondents. This reflects the low PD referral rates described by Plant et al, (2002).

Utilisation and benefits of Cueing Methods

Auditory methods were used by all but two respondents. It is worth noting that some included emphatic verbal cues within auditory (rather than cognitive) strategies, and that the reported levels of auditory use and benefit within this patient category were higher than for any single method sought in this study. Among the very few early stage patients seen, about a quarter of therapists used auditory methods 'often', with high confidence in their benefit. For middle stage patients, about half used them 'often'. This high reported use and benefit extended into the late stage of the disease.

Slightly fewer respondents used visual cues, but most employed placed objects, floor markers, intrinsic floor patterns or colours to improve gait pattern and decrease akinesia and freezing. The patterns of use and attributed benefits ('very little' by most for early stage PD patients, 'sometimes' by almost half for middle stage and by somewhat fewer for late stage) provide a notable contrast to the extended use and benefit period of auditory cueing. This may reflect the relative complexity of visual field processing and reactions. Some respondents questioned the relevance of visual cues within the clinical environment (eg markers on the gym floor). Others suggested that by late stage PD, the utility and benefit potential of visual cueing was limited by cognitive and physiological impairments. Additional research may clarify the most effective use of visual cues for particular patients.

Proprioceptive techniques were also commonly utilised, but seldom so in early PD stages. Most therapists described techniques applied in middle stage PD, to initiate movement and overcome gait freezing, though it was not always clear whether the cueing was verbal suggestion or direct facilitation. Usage in late PD appeared to be lower, and benefits lower still. This may be consistent with observations by Morris (2000) of severely reduced mobility in late PD. However, a small but notable percentage used proprioceptive techniques 'very often' in late PD despite rather lower benefit ('often'), and it seems worth remarking that even very marginal benefits at this stage may be of great importance to patients (Kamsma et al, 1995).

Many respondents described polysensory cueing techniques within the proprioceptive category. Likewise, few studies clearly show the effects of proprioceptive cueing for PD patients. Some research describes the combined effects of proprioceptive, visual and auditory cueing (Marchese et al, 2000) and others used verbal instruction to facilitate proprioceptive input, thus improving gait variables. Mixed cueing inputs make the success of proprioceptive treatment difficult to assign.

Cognitive strategies presented a further problem of analysis. Some respondents identified their low use of cognitive strategies in late PD as commensurate with the severe cognitive impairments typical among this patient group, as described by Morris (2000), but some of these were held to benefit when carers or families were taught to use these cues: for example 'specific transfers … have written down stages so that relative can assist.' This clearly describes a 'cognitive' strategy carried out by carers, rather than by the patient.

Other therapists described the use of verbal prompts (which may be auditory, cognitive or both) in their cognitive strategies, to help patients distinguish components within movement sequences. Many therapists combined proprioceptive and visual input in their cognitive treatments.

It seems difficult to say what cognitive cueing might mean in practice or theory. Plant et al (2001) class it as internal, and distinct from external strategies. Nieubower et al (1997) class it as an external form of control, because it is not intrinsic to normal motor programming. Kamsma et al (1995) and Morris (2000) emphasise the role of cognition in all cued strategies. An implicit lack of common definition may account for the very low reported usage within this study.

Mixed cueing practices

Data for use of mixed strategies were not sought in the questionnaire but were offered in written responses, which may reflect the pragmatic nature of physiotherapy cueing practice. It has been suggested by Marchese et al, (2000) that combined visual, auditory and proprioceptive cueing may have long-lasting transfer of gain, reduce global bradykinesia and improve functional balance. Visual cueing techniques as noted by Weissenborn (1993) may have strong proprioceptive and attentional components.

The present study suggests that combined auditory and proprioceptive cueing may be effective relatively late into the development of PD, compared to other methods. Further research is needed to test this possibility.

The utilisation of cueing methods outside the clinical setting

This was particularly revealing. Morris (2000) strongly supports the early use of cueing as a preventative measure but that is not reflected in this study.

The results also appear to confirm a progressively reduced transfer of gains between differing functions and contexts in the course of PD, and increasing dependence on carers for treatment benefits. Respondent comments included:

'those with no cognitive … problems or those supported by carers who attend physiotherapy treatments achieve the most carry over into function … very few/none have the capacity to employ any strategy independently'.

In relation to this, it seems surprising that only one respondent referred overtly to the benefits to be gained from cueing taught in the home, as recommended by Kamsma et al (1995).

Outcome measures

Most therapists appear to exercise considerable discretion in their choice of PD treatments and measures. Over half (61%) used timed distance walks to assess their patients' progress. However, a timed walk over a straight course in a clinical setting may represent a practicse effect with limited transference or relevance to ADL (Kamsma et al 1995). It is worth remarking that some use only this measure and that few used any systematic PD measures. Worryingly, less than half the therapists surveyed had read the *The Guidelines for Physiotherapy Practise in Parkinson's Disease*.

Limitations of this study

The sample is too small to represent widespread specialist opinion, and the use of single cueing categories as headings may have led to further limitation of results as some responses evidently derived from mixed cueing practises. The patient treatment data is inevitably confused by the method used to obtain it.

The three-stage patient categories oversimplify a complex and variable PD population. Morris's model for physiotherapy is based on the five stages defined by the Hoehn and Yahr scale. This may be more sensitive, and more familiar to many therapists (Morris, 2000).

Some of the categorical questions seek subjective, rather than exact quantities, for example, 'few', 'many', or 'hardly ever'. An approximate number of patients seen per annum may have provided more useful baselines.

CONCLUSION

The results appear to strongly support the use of auditory cues for middle and late PD patients. Visual cue use is also strongly supported, though some therapists and researchers question the relevance of the most commonly used methods. Proprioceptive methods are less used, but seem strongly supported by the therapists who use them. It is possible to surmise that these relative levels of use are approximately reflected by the amount of literature dedicated to each cueing category. This would suggest, on the one hand, that most therapists use well-evidenced cueing methods and on the other, that more research is required into less well-evidenced, defined cueing practices.

Although the benefits of cued treatments seem progressively reduced from middle to late PD stages, auditory, proprioceptive or mixed cueing methods might continue to offer benefit for patients reliant on carer education and support.

The results clearly suggest that very few patients receive physiotherapy in early PD stages. It is not clear whether this stems from a high demand for limited services, or from low potential benefits anticipated by PD patients and those who might otherwise refer them (Plant, 2002; Yarrow, 1999). Early stage PD patients are as poorly represented in physiotherapy cueing literature as they appear to be in physiotherapy caseloads. It is therefore difficult to develop an evidence base for the benefits of cueing from early to late stage PD, though Morris' treatment model is clear on what this might offer. Lastly, the GPPPD guidelines (which substantially cite Morris' findings) are available, but appear to be underused. The National Centre for Clinical Excellence (NICE) is at present developing further guidelines.

We need to continue to increase our evidence base for the use and benefits of cueing techniques, and to re-evaluate the reasoning and choices that underpin current physiotherapy practice for PD.

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APPENDIX 1

PD stage classification (from Pilot Questionnaire)

In the absence of any uniform or reliable method of disease classification or impairment measures for PD patients, we are using generalised categories of early, middle and late PD stages (Jones and Godwin-Austen, 1998) as patient groupings. In our opinion, these groupings respectively approximate to the scale categories of 1, 2 and 3 of the Parkinson's Disease Rating Scale [Webster Scale] 1968 (Carr and Shepherd, 1998). They are intended as a guide only.

EARLY

- Some Bradykinesia
- Beginnings of flexor pattern
- Mild rigidity
- In walking, one arm shows decreased swing. Stride length 30-45cm. Unequal L-R heel strike. Turning around slow, requiring several steps.

MIDDLE

- Moderate Bradykinesia
- Slow performance of most activities
- Moderate rigidity
- In walking, restricted arm swing. Stride length 15-30cm. Forceful L and R heel strikes. Some balance difficulties.

LATE

- Severe Bradykinesia
- Marked flexor posture in standing
- Severe resting rigidity in trunk and limbs
- In walking, no arm swing. Gait shuffling and festinating, stride length between 8-15cm. Severely impaired balance. Freezing episodes common.

Effect of a functional electrical stimulator

on a patient with decompression sickness

Melanie Ann Falk Grad Dip Phys MCSP
Physiotherapy Department,
Bristol General Hospital,
Bristol BS1 6SY

KEY WORDS
Decompression sickness
Functional Electrical Stimulator

INTRODUCTION

A young patient who was suffering from decompression sickness presented with weakness in her left dorsiflexors, and with sensory changes in her left lower limb. Despite a course of physiotherapy including gait re-education and strengthening exercises there was no objective or subjective change in her condition for eight months. She was then referred to the neurology outpatient department and was given a trial of a functional electrical stimulator to the weak evertors and dorsiflexors and an improvement was seen within three weeks. Improvement continued rapidly and the patient was walking normally within a month. Six months after starting this treatment Sarah was able to run a half marathon in 2½ hours.

THE PATIENT

Sarah was a previously fit and well 21-year-old student who was an experienced diver. She had been diving on a regular basis without any previous problems and was fit and regularly exercised. Past medical history included fractures of left ankle, fingers and left wrist from an earlier diving accident. She was living in a shared house and had no disabilities.

In May 2001 she experienced problems on coming out of the water, and was unable to carry the boat with her other crew members. Three to four days later she noticed increased weakness in her left shoulder. She vomited and felt light-headed. There was numbness and tingling in her left arm and leg. She had weakness of her left hand grip and a left foot drop. Her problems increased with malaise and 'cognitive problems': she felt unable to process information.

Two weeks later she underwent hyperbaric oxygen therapy in Plymouth, and her memory improved. The treatment lasted up to six hours a day for two weeks. On discharge she felt less fatigued but still had numbness and tingling. Other problems now were a left foot drop, left arm weakness, left shoulder weakness, pins and needles and occasional pain in her left side. She also complained of extreme fatigue. In June 2001 Sarah's symptoms became worse with increasing weakness. She had increased fatigue and numbness again. She was re-referred to Plymouth where she had a further week of hyperbaric oxygen treatment.

Two months later she again had problems of foot drop, with pain in her left upper and lower limbs. She was seen as an outpatient by the neurologists.

In November 2001 she went climbing in the student union on a metal rope ladder, which she had done previously without any problems. She went for a drink afterwards and felt tired and nauseous in the pub. She walked home and had a shower. She lay on the bathroom floor and was unable to get up due to pain and weakness. She attended casualty and was admitted to hospital for one month. All medical tests proved negative.

INTERVENTION

Sarah was referred to physiotherapy and seen in a musculosketetal outpatient department. Treatment included exercises to increase strength in the affected muscles, and gait re-education. She was able to walk at this stage with one stick and a hinged ankle foot orthosis. There was constant pain down the weaker left side for which she was taking gabapentin 600mg three times a day. Progress was slow, with no improvement in the strength of her ankle muscles.

Sarah was referred to the neurology outpatient department, Bristol General Hospital, in January 2002. She was only able to walk two or three steps without her splint, as her foot constantly inverted and planterflexed. She felt shocked and depressed at having been told that she may not walk again.

Sensation was decreased on her left side over the lateral aspect of her left thigh with numbness in her left foot. Co-ordination was also reduced on the left. She was found to have weakness and reduced range of motion in her left upper limb (generally grade 4, Oxford scale), and had difficulty holding objects in her left hand. Her left lower limb had more marked weakness, with only a flicker of activity in her foot and ankle. There was poor control of her left knee with a tendency for it to either hyperextend or flex uncontrollably during gait. Planter reflex was positive on the left and reflexes were brisk.

Problems were:

1. Weak eversion of the ankle and flexion of her left knee.
2. Reduced stability and control of her left knee, with some hyperextension in walking.
3. Altered sensation in her left leg.
4. Instability and weakness in her shoulder.

The use of electrical stimulation to improve control of her dorsiflexors was discussed and Sarah was very keen to try it. The Odstock foot stimulator (ODFS) worked well although Sarah was only able to walk five to six steps before the dorsiflexors fatigued. The pressure sensitive switch in the affected shoe controlled the timing of the stimulation of her dorsiflexors .She was issued with a muscle trainer Microstim 2 (MS2) to use at home for two weeks. This pulsed electrical stimulator builds up the strength in weak muscles This was to be used over her tibialis muscle for progressively longer periods of time, working up to 20 minutes twice a day. As she was unable to walk more than four to five steps without her foot orthosis, a timed walk was not done at this stage.

Sarah returned to the department on 26th February 2002 really pleased with her progress. She had better sensation in her feet, and had more control over her foot movements. She was able to walk ten metres in 25 sec. with the ODFS and no walking aids. Without the ODSF she managed it in 1 minute and 5 seconds. She was competent applying the stimulator, and was loaned one to use at home.

A week later she returned having noticed further improvement. She still used her orthosis to rest her muscles, which were fatiguing easily. Her walking speed was again tested, this time with a physiological cost index (PCI) measurement. This involved recording her average increased heart rate and her walking speed to measure the energy consumption on walking. The lower the score the less energy used (normal is around 0.2) She was able to walk ten metres in six seconds with the ODFS on, with a PCI of 0.16. Without her splint or ODFS she walked ten metres in an average of 14.8 seconds, and a PCI of 0.29.

She continued to use the ODFS at home until her next appointment on 12 th March 2002. She now reported that she could walk without dragging her left foot and she had started to walk without the ODFS. She was able to do the ten metre walk in an average of six seconds without the stimulator, and with a PCI of 0.18. The altered sensation just over the lateral border of the foot continued to improve. At this stage the ODFS was returned as it was no longer required.

Just over a month after starting treatment Sarah reported that there were no problems with walking, and objectively all muscle power was now graded at 5 Oxford scale in her lower limbs. She was able to run short distances. Gabapentin, prescribed to control pain, was reduced and stopped with out any ill effects. She still had residual problems of stiffness and weakness in her right shoulder.

In September 2002 she ran a half marathon in under 2 and a half-hours, something she thought she would never do following her accident. She wrote to our department expressing her delight in the outcome, and donated her sponsor money for us to put towards the purchase of a further FES.

Date	PCI with FES	10m walk with FES	PCI without FES	10m walk without FES
5 Feb 2002	N/A	N/A	Unable to complete	Unable to complete
26 Feb 2002	N/A	25 sec	N/A	65 sec
5 Mar 2002	0.16	6 sec	0.29	14.8 sec
12 Mar 2002	FES no longer used	–	0.18	6 sec
22 Sep 2002				Ran 13miles in 2½ hours

Table 1

IMPLICATIONS FOR PRACTICE

Sarah's symptoms had remained largely unchanged for eight months despite having had physiotherapy. Within one week of the application of the stimulator there was an objective improvement in muscle strength. This improvement continued rapidly with the use of the functional foot drop stimulator. Sarah was able to run the half marathon seven months after starting the treatment, which indicated that not only had full power returned but also fatigue was no longer a problem in these muscles.

DECOMPRESSION SICKNESS (DCS)

As a diver descends while breathing compressed air the inhaled partial pressure of oxygen and nitrogen increases, as well as the amount entering the blood and tissues. The dissolved state is harmless but if the diver decompresses too quickly excess nitrogen leaves tissues and enters the blood stream in nitrogen bubbles .The bubbles are space occupying and can compress nerves and/or block the circulation of blood. The larger and more numerous the nitrogen bubbles, the more likely they will cause symptoms of DCS. Neurological symptoms are particularly common because nitrogen is highly soluble in fat (five times more than in blood), and dissolves readily in the fatty myelin sheaths that surround nerve. If too much nitrogen is in these nerve sheaths at the beginning of ascent, bubbles may form and compress nerves before they enter the venous circulation. Bubbles can also set off certain chemical reactions, collectively called an 'inflammatory response.' This is marked by release of certain protein compounds that can damage the blood vessels and affect blood clotting (Green, 1987). (Bove, 1982; Catron, 1982; Smith, 1994).

DCS commonly presents gradually, starting as tingling and numbness .The median time of onset for the first symptoms of DCS is about 20 minutes after surfacing; for further symptoms, two hours (Dan, 1988). This suggests that Sarah was suffering from decompression sickness. Of 133 patients treated for DCS in England over a 20 year period, 81% presented with spinal cord injury, 27% with cerebral injury, and 10.5% with inner ear symptoms (Green, 1987).

TREATMENT FOR DCS

The only effective treatment for DCS is immediate recompression in a hyperbaric chamber. All manifestations of DCS are potentially reversible if the patient can be quickly recompressed in a chamber. Recompression 'squeezes' the nitrogen bubbles to a smaller size and allows a slower and safer egress of nitrogen from the tissues. Treatment is recommended even if symptoms abate or clear before the patient reaches the chamber. This is because bubbles may still be present in the circulation, and could lead to a more serious problem later on, as was the case with Sarah.

CONCLUSION

It is difficult to explain how Sarah changed with the ODFS in such a short time. It may be that the neural pathway, possibly in her spinal cord were reopened in response to the stimulator, as the muscle changes were too rapid to be explained by strengthening alone. As this was the only significant change in her treatment it is highly suggestive that the ODFS was responsible for the dramatic changes.

The muscle stimulator may be useful in achieving profound recovery in weakened muscle groups in similar cases although the mechanism is not entirely understood.

KEY MESSAGES

The functional electrical stimulator, already shown to be useful in other neurological conditions has a place in the treatment of decompression sickness. With prompt referral to an appropriate physiotherapy department earlier recovery for similar patients may be possible. Further research into this area is needed.

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FOCUS ON
Motor Nerve Clinic
King's College Hospital NHS Trust, London – a clinic for patients with suspected or diagnosed motor neurone disease

Interview with Ulrike Hammerbeck and Helle Sampson, Senior I and Senior II rotational neurophysiotherapists, King's College Hospital. Additional information, advice and photographs provided by Emma Willey, clinic co-ordinator.

In 1990 Professor Leigh set up one of the first multiprofessional clinics within the NHS to provide a comprehensive outpatient service for people affected by motor neurone disease (MND). The Care and Research Centre was established in July 1994 and is now one of eleven care and research centres in the UK recognised and funded by the Motor Neurone Disease Association (MNDA).

The King's MND Care and Research Centre team continues to be led by Professor Nigel Leigh and consists of over 40 individuals working together in three main areas:

- Outpatient Clinic
- Clinical trials
- Research

There is equal commitment to care and research and this provides an essential combination for offering hope and support to the people affected by MND.

Who is involved in the outpatient clinic?

It is a multidisciplinary team based in the outpatients clinic at King's College Hospital and comprises a team of therapists (occupational therapist, physiotherapist and speech and language therapist), dietitian, four neurologists and nurses who link with specialist teams (also based within King's) including palliative care, respiratory medicine, radiology, gastroenterology and counselling.

How does the clinic run?

REFERRAL/DIAGNOSIS

- Patients in South East England are referred from their GP to a local consultant neurologist, then to a consultant neurologist at the motor nerve clinic.
- Once referred, patients are usually admitted to the regional neurosciences unit at King's College Hospital for investigations to establish a diagnosis.
- If MND is diagnosed or suspected they are offered follow-up in the clinic.
- The consultant will explain the initial diagnosis and the patient is given written information/contacts eg MNDA (Motor Neurone Disease Association).

CLINIC

- An outpatient clinic runs weekly. On average ten patients are seen per clinic. Patients have the opportunity to see all members of the multidisciplinary team in the clinic. The decision as to who is consulted is patient driven with advice from the neurologist and clinic co-ordinator.
- Patients are reviewed according to their needs varying from a few weeks to three monthly.
- The clinic team meet weekly to discuss the patients from the previous week's clinic and action taken and the patients due to attend the forthcoming clinic.

What is the physiotherapist's role?

The main role is to pick up problems and ensure that there is appropriate follow up and to work in partnership with the patient's local physiotherapist. Patients are assessed according to their needs which may include:

- Respiratory assessment – to establish any respiratory muscle weakness and the effectiveness of their cough.
- Posture – frequently assessing head control and the effectiveness of various collars and supports. Wheelchair users may be briefly assessed for the appropriateness of their current seating package.
- Overall physical ability – particularly their level of exercise tolerance and fatigue. Hand function, including posture, atrophy and positioning, as well as generalised muscle shortening and tonal changes may also be assessed.
- Mobility – to establish the appropriateness of walking aids and orthotics, as well as the patient's safety when walking, transferring and negotiating stairs.

Due to time constraints, interventions in clinic may be limited but typically include:

- Advice re exercise in progressive neurological disease (submaximal exercise is encouraged).
- Provision of assistive devices eg collars (MNDA, Oxford, Headmaster, soft), thumb opposition splints (see *Figure 1* and *2*).
- Teaching assisted cough to patients, carers and relatives (see *Figure 3*).
- Providing basic stretching and exercise programmes.
- Making referrals to local physiotherapy teams/orthotics via the consultants for follow up as well as recommendations for wheelchairs and assistive technology (for environmental controls, mobile arm supports).
- Fatigue management advice.

What do you think are the benefits of the clinic?

It has a patient centred approach providing a network of services in south-east England. The patient can access all members of the multidisciplinary team at one appointment with minimal waiting time. They can also contact the clinic co-ordinator directly who can provide advice and an immediate link to the clinic. If necessary patients will be seen in the next week's clinic, staff are therefore alerted to issues and able to respond to change quickly.

The team endorses the MNDA's standards of care and seeks to achieve them for all people affected by MND. The standards are based upon the following key principles:

- Management of the disease determined by the needs and wishes of the person with MND, their family and carers.
- Flexibility and speed in response to referral.
- Continuity of care throughout the progression of the disease.
- Co-ordination and co-operation between service providers.
- Regular monitoring and review.

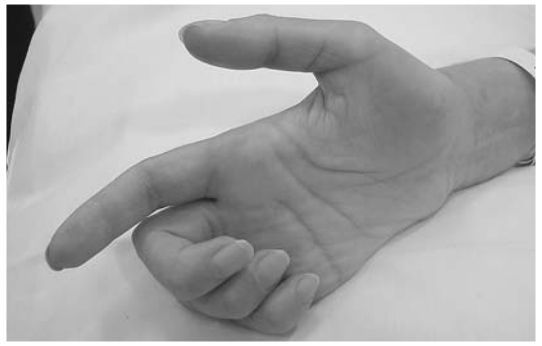

Figure 1 Hand of MND patient, showing common deformity

Figure 2 Thumb opposition splint to correct deformity

Figure 3 Assisted cough

Do you provide an advisory service?

We frequently receive calls from physiotherapists around the country for advice regarding the treatment and management of patients with MND. We are happy to receive these calls and advise as we are able.

There is a King's website which anyone can access: *www.mndcentre.org.uk* The MNDA is another useful contact : *www.mndassociation.org.* In addition, the BUILD website is run by people affected by the disease and covers a useful/interesting range of issues from the viewpoint of service users: *www.build-uk.net*

Do you find there is an emotional impact of dealing with these patients?

It is hard to detach yourself from patients with this condition. Sadly there is little provision for staff support. Much can be gained however from working in a team focused on the team approach and involving individual specialities who meet regularly to discuss patient and team issues (Carter H et al 1998).

What is the focus of current clinical trials and research?

The clinical trials team and the research team includes doctors, nurses, psychologists and scientists. The research programme includes both laboratory and clinical projects. Laboratory projects include genetics, database projects, DNA bank and tissue donation. Clinical projects include scanning, non-invasive ventilation, psychological and clinical trials.

Are there any courses or training?

There is an annual conference run jointly by King's and St Christopher's Hospice which covers therapy, advances in research and issues relating to MND. These are usually run in June and advertised on the website and through the hospice mailing. The next conference will be on June 16th 2005.

For further information about disease management and support see Leigh et al (2003)

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ACPIN news

EVENTS SUB-GROUP REPORT

The next ACPIN Conference 'Hands on Neurophysiology' will be held in the Wolfson Lecture Theatre at the National Hospital for Neurology and Neurosurgery on Saturday 13th November.2004. This day course has attracted many eminent speakers who will provide an insight into the clinical relevance of neurophysiology, details can be found in *Frontline*, and on www.acpin.net, or by contacting Louise Gilbert, executive committee member.

In 2005 the March one-day conference and AGM will be held in the Northampton Hilton on 5th March 2005 and will be on 'Pain and Neurodisability'.

At present the programme for CSP Congress 2005 in Birmingham is being organised and will be on 'Cognition, Perception and Behaviour: Complex Challenges to Rehabilitation,' although the CSP have not made a final decision on format for the event. All courses will be advertised in *Frontline* and on the web.

If you have any ideas for future courses please contact one of the executive committee.

FEEDBACK FROM EVALUATION FORMS

Northampton Gait Conference March 2004

Overall the one day National ACPIN Conference was received very positively with 80% of participants reporting that the course was very useful or useful, and 79% reporting that the content was 'about right'. There were many comments asking for more time for discussion. We have tried to address this for the next ACPIN Conference on 'Hands On Neurophysiology' in London on the 13th November2004, where we will have a discussion panel, so we hope that the day will be more interactive.

A number of participants requested handouts or a full reference list. We have contacted some of our past speakers and as a committee have discussed these recurring requests. At present we have decided to continue not giving out handouts as not all speakers are happy to provide them. We will ask speakers to provide a full reference list, which will go into the participants pack.

Please continue to provide us with your comments as we do look at them seriously.

WEBSITE UPDATE

The ACPIN website is currently under a big review by the committee. Currently the website is edited twice a year by an external graphics and website company, who also produce all the graphics for posters for courses etc. It is felt that a greater flexibility is required with the site, such as to update course programmes and change regional representative details. The committee feel it would be useful to have more regular access to edit the site, and so are currently investigating the options available to do this. This should help us to keep our membership better informed.

ANNUAL REPRESENTATIVE CONFERENCE 2005

Every year ACPIN submit motions for discussion at this conference. These motions should be the subjects that the ACPIN membership feel strongly about and want the CSP to act upon.

The Communication Sub Group will then word appropriately the motion and submit it for debate at the conference.

In the two previous years ACPIN have had two motions accepted, debated and voted through – availability of botulinum toxin, access to appropriate seating and access to rehab space.

We hope to continue this trend and would appreciate the membership's involvement.

If you have any 'burning issues' please could you send your suggestions via email to Ros Cox or Emma Forbes.

CLINICAL PRACTICE AND AUDIT GROUP

Jo Tuckey – Membership Secretary

Thank you to all those who took the time to comment on the CSP's core standards of practice and the need for specific neurology standards. Overall, the majority of comments received from regions suggested that neurology specific standards were not required. It is also now understood that the CSP no longer support separate CIG standards and their revised standards are soon to be published.

The clinical practice and audit group felt that the comments received were nevertheless valuable. Therefore in the next edition of *Synapse* we plan to publish a neuro specific guidelines/guidance resource page.

COMMUNICATION SUB-GROUP

Emma Forbes

Presently the communication sub-group is working towards updating the Regional Representative's pack. This was started at the last committee meeting and a list of recommendations has been drawn up.

This includes changing the documentation, wording and hopefully making it available in electronic format.

The sub-group is also working on motions for debate at the Annual Representatives Conference 2005 – please see the ARC 2005 item on this page.

CONSTITUTIONAL AMENDMENTS

Nicola Hancock Honorary Chair

We have received feedback from the CSP regarding our new Constitution, which was positively voted upon at the AGM 2004, and the following amendments have been made in response to the comments received:

- 7.2: The Honorary Officers must include Research Officer and Diversity Officer, a title adopted by CIGLC in 2003.
- 13 and Appendix: Amendments need to be approved at CIGLC and PPC.
- It was also noted that point 7.10 suggests that an executive member can serve for a total of twelve years which may lead to a degree of stagnation. This is to be further addressed by the executive committee and will not hold up the approval of the other changes at PPC.

Other news

MESSAGE FROM THE NEUROLOGICAL ALLIANCE

Did you know that your patients can have a free copy of *Getting the Best from Neurological Services?* This booklet has been produced by the Neurological Alliance, and is the complete guide to what is available for people with neurological conditions, and how to get it. Over 13,000 copies have been distributed since it was published last year, and it is the Alliance's most popular publication. Moreover, it has encouraged the approach that every person with a neurological condition is unique, that is, not a set template. The Neurological Alliance comprises nearly 70 national, specialist charities like the MS Society and regional alliances all with the aim of improving services for people with neurological conditions.

Other Alliance publications include 'Levelling Up', standards of care for people with neurological conditions and 'Neuro Numbers', the only survey of the number of people in the UK with a neurological condition. The Alliance is now working on the upcoming NSF for Long Term Conditions (ie the Neurology NSF) to ensure it meets the needs of patients, and that it is fully implemented. Ten million people in the UK have a neurological condition, and the Alliance is making their voice heard.

For regular updates about our work and to order or download publications, visit www.neural.org.uk – remember – they are free.

PROFESSIONAL ADVANCEMENT FOR EXPERT NEUROTHERAPISTS

Meeting the Challenge: A Strategy for the Allied Health Professions was published by the Department of Health in 2000 and went a considerable way towards improving the career pathway for therapists who wish to remain in the clinical field. With this came new responsibilities and the requirement of new skills.

To date, therapists who have chosen to remain in the clinical field have not been exposed to key managerial skills, which will be required for example in a consultant therapist post. Consultant posts will have a significant service design and delivery aspect to them, which will require a degree of competence in areas such as change management, project management and contributing to business planning.

With this in minda project has been developed following a successful application for funding from the North West London Workforce Development Confederation – the 'Challenge Fund'

This project, led jointly by St Mary's and Hammersmith Hospitals, aims to develop therapists to meet key aims of the NHS Plan and *Meeting the Challenge*. It is directed towards clinical staff who are at Clinical Specialist level (although there are three at senior 1 level who are known to be clinically competent) and who wish to pursue a clinical career. It is aimed at neurotherapists but expect it addresses the concerns of therapists in any speciality.

A half-day in December 2003 was promoted to engage all staff in the relevant Trusts that might be interested, plus key personnel from professional bodies. With the expertise of an external facilitator five key areas were identified that therapists would wish to develop.

The project has incorporated these five areas as separate modules in a course, which will run from March 2004 until September 2005.

The five areas comprise:

- Professional/Personal attributes – addressing skills such as leadership, time management, change management and organisational politics.
- Research Skills – setting up a clinical research project, seeking out advice and filling out an ethics application.
- Project management – skills required to scope, identify gaps and redesign a service.
- Business management – skills required to develop and produce a business plan.
- Education and Training – skills required to disseminate knowledge, skills and evidence-based practice throughout an organisation.

Each module is over two months. There is a full taught day at the beginning, from which participants are expected to identify work related projects. At the end of the module there is a half day where work is presented together with further teaching and discussion. The course is now part way into the research module and the participants are required to have filled in an ethics form by the end of the module.

This is a project, which aims to address the stated development needs of advanced clinical practitioners and reflects many of the areas of competency expected in a more advanced level practitioner. There is no taught clinical component as at this level there is an expectation that the clinical skills are high. It is a multidisciplinary project involving physiotherapists, occupational therapists and speech and language therapists. It aims to promote the philosophy of peer support, review and networking, enhance the effectiveness of therapists in developing and the delivery of education and training, and realise the potential of AHP's. To this end, year-long facilitated learning sets are being offering to participants to assist with the integration of topics addressed in the course.

The course aims to provide a blueprint for addressing development and create a transferable model for future use. Most importantly it equips key frontline staff with the skills they require to make the leap from Clinical Specialist to Consultant Therapist. Interestingly a number of similar courses have been organised since, reflecting very similar learning needs.

UNITED IN CARE

British Geriatrics Society is pleased to announce the inaugural multi-disciplinary conference, 'United in Care' – a collaborative conference on the health care of older people, being held at the Royal College of Physicians, London on Wednesday 1st December 2004. This conference aims to identify ways to improve interdisciplinary collaboration among the health professionals providing health care for older people.

For more information and to register, please contact MEP Ltd on 020 7561 5400 or email on sbradley@mepltd.co.uk

TEACHING THE TEACHERS

A three day course in teaching skills

Many clinicians find themselves involved in the education of physiotherapy students, newly qualified staff and/or their peers and colleagues as a result of their own clinical expertise. It may be that this is a field they feel ill equipped to deal with despite having valuable knowledge and insight within their area of practice.

Clinical expertise and knowledge is a glorious thing – being able to pass this on and inspire others to take on broad ideas and issues you may have started to explore is potentially more glorious!

This three day course introduces skills that will help the clinical teacher provide a positive and constructive learning experience for those students. The emphasis is on teaching skills and techniques. Often 'less is more', and it isn't always necessary to try and pass on everything you have learnt in one swoop! 'Discovered learning' may often be more educationally and clinically useful in the long term, and the way in which adults learn and assimilate new information is very different from our experiences as undergraduates.

The course is facilitated by lead tutor Dr Kay Mohanna FRCGP MA. Kay is a practising GP and Principal Lecturer in Medical Education at Staffordshire University School of Health. She has co-authored a number of published articles, including the main text for the course 'Teaching Made Easy'.

The second facilitator and course organiser is Lynn Pearce MCSP SRP LicAc Cert Med Ed, Chartered Physiotherapist, Licentiate in Acupuncture and Lecturer.

This three day module is accredited to the full Certificate in Medical Education run at Staffordshire.

- Venue: Buckden, Cambridgeshire
- Dates: Tuesday-Thursday, November 23rd-25th 2004
- Cost: £350 (includes coffee lunch/tea)

For further information please contact: Lynn Pearce The Little Cottage, 2 Audrey's Court, 153 Great North Road, Eaton Socon, St Neots, Cambs. PE19 8EQ. Tel 07939 540 940 e-mail lppphys@acupuncture.fslife.co.uk

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Research forum

In the last year, many of you have spent some of your precious time filling in the research questionnaire that has accompanied the membership form and the survey of neurological physiotherapy services that was sent out with the Spring issue of *Synapse* this year. We are devoting this section to giving you some feedback on the responses to these surveys and we are continuing our *Stats note* series. Also included is an update of the terms and conditions for the ACPIN Research Bursary for 2004/2005.

SURVEY OF NEUROLOGICAL PHYSIOTHERAPY SERVICES, SPRING 2004

Introduction

Earlier this year, we circulated a supplementary form – *Survey of Neurological Physiotherapy Services* – with the Spring issue of *Synapse*. The idea was to canvass the opinions and experiences of ACPIN members about key issues relating to neurological physiotherapy services. We were particularly interested in organisation of services and their staffing in the NHS, facilities for the services and the effects of national policies and guidelines on practice. We have had over 275 forms returned and we would like to thank members who took the time to complete and return the survey. In this issue of *Synapse*, we are presenting a preliminary analysis of the survey, based on 261 questionnaires entered into the database to date. Please note that, because this is a preliminary analysis, results and conclusions are not complete and we are continuing to work on the outcomes of the survey.

Of the respondents who returned the form, 234 worked in the NHS with 12 having up to 2 years experience in neurology, 63 up to 5 years, 71 up to 10 years and 87 more than 10 years experience. 27% were employed in their current services for less than 1 year, 44% for between 1 to 5 years and 29% for more than 5 years. The majority, 170, were in permanent employment and 64 were employed on a temporary basis. 32 respondents were employed at Junior/Senior II level, 141 at Senior I level and 61 were employed as Superintendent/Clinical Specialist/Team Leader/Consultant.

Neurological Services in the NHS

We asked respondents to indicate the neurological services they were currently involved in and their typical caseload. The majority (58%) were involved with more than one of the following services: acute inpatients, inpatient rehabilitation, stroke unit, specialist neurological unit, outpatients, intermediate care, primary care/community and other. The services that physiotherapists were most frequently involved in were Outpatients (26%), Stroke Unit (17%) and Primary Care/Community (15%). There were 20 responses in the 'other' category which were predominantly specified as day hospital, management and specialist clinics. Few respondents typically treated one type of neurological condition with the majority of 79% treating more than one type of neurological condition. The caseload of physiotherapists varied greatly. However, on average, stroke and multiple sclerosis formed the greater proportions of physiotherapists caseload (52 ± 32% and 27 ± 22% respectively) with average percentage of caseload for other conditions such as brain injury, spinal cord injury and Parkinson's Disease ranging between 5 and 15%.

In terms of the percentage of allocated time to specific services, the greatest average times were observed for Primary Care/Community (70 ± 35%), Specialist Neurological Unit (69 ± 34%) and Stroke Unit (66 ± 33%). Indications were that the staff involved in these services was less likely to have split roles. In 204 cases, it was possible to identify a predominant type of service (inpatient or outpatient/community) that therapists were involved in: 118 were involved in in-patient services, 86 in outpatient/community services and 12 in split posts (minimum of 40% of time in inpatients and outpatients).

120 people responded to our request for information about inpatient services. In 69% of cases, there were specified beds for neurological patients and in 76% of cases, there was a dedicated stroke unit. 52.5% also treated patients with neurological conditions that were placed in general beds. *Figure 1* shows the frequency count for bed allocations for neurological and stroke patients. It can be seen that in most cases, between 10 and 30 beds were allocated for neurological and stroke patients and that there were some notable exceptions where over 100 beds were allocated for neurological patients. In 74% of cases, there were patient selection criteria for beds.

The majority of respondents received up to 20 referrals each month with the maximum being 40 referrals. GPs, consultants, specialist nurses and AHPs were similarly cited as referrers to physiotherapy services. On the whole, the number of patients on waiting lists was less than 20 patients but in a few cases exceeded 50 patients (see *Table 1*). *Table 1* also

FREQUENCY DISTRIBUTION OF NUMBERS OF SPECIFIED BEDS FOR NEUROLOGICAL AND STROKE PATIENTS

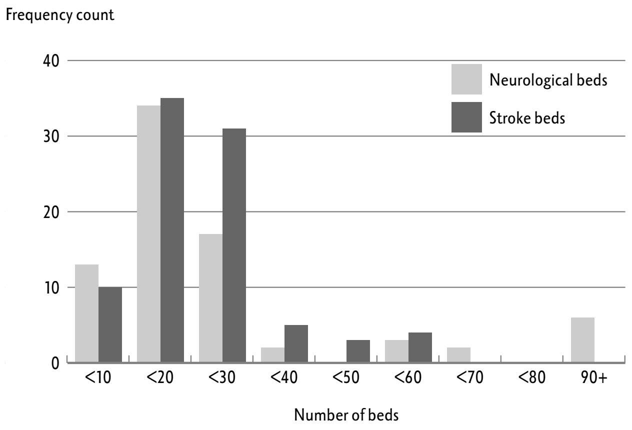

Figure 1

FREQUENCY DISTRIBUTION OF NUMBERS OF PATIENTS ON WAITING LISTS AND WAITING TIMES FOR APPOINTMENTS

No of patients on waiting list	Frequency of responses (n=55)	Waiting time for appointment (weeks)	Frequency of responses (n=67)
5	18	2	18
10	15	4	20
15	4	8	18
20	5	12	5
30	6	16	4
40	3	26	1
50	3	52	1
60	1	–	–

Table 1

WEBSOURCE

INFORMATION SOURCES

- **www.ncchta.org**
  A website that ensures that high quality research info on costs effectiveness and broader health issues is produced in the most effective way for the nhs.
- **www.ebm-guideline.com**
  Useful website for information on evidence based medicine, allows free membership on registration for two weeks.
- **www.jr2.ox.ac.uk/bandolier**
  Produced monthly in Oxford for the NHS R&Ddirectorate. It contains bullet points of evidence based medicine.

shows the frequency distribution of average waiting times and indicates that most patients would be seen within eight weeks.

Space, equipment and specialist services

The majority (81%) had designated space for neurological rehabilitation and 73% stated that they shared this space. In terms of the actual size of rehabilitation space, there was large variation ranging from $1m^2$ to $750m^2$. An area of between $20\text{-}50m^2$ was most common. However, 48% felt the space available did not meet their needs. As well as the size of the area, other reasons given were lack of storage for equipment and location. 20% indicated that there had been changes in the space available to them in the past year. Of those who commented about the changes, half were positive changes with increased facilities and half were negative with loss of space or increased sharing and demands on the available space.

The survey investigated the availability of equipment required for physiotherapy on a day-to-day basis. Equipment, like pillows, plinths and up-down tables was available all or most of the time. Irrespective of whether people worked either in in-patient or outpatient services, the availability of specialist seating, positioning aids and wheelchairs was a problem. Although exercise equipment was available all or most of the time for 61% of respondents, only 34% had a treadmill available for use.

Similarly, there was limited availability all or most of the time of electrical/hydraulic equipment for walking (41%). 61% stated that equipment availability was limited by funds with 67% reporting that it was difficult or very difficult to obtain funding. The comments made by respondents highlighted the difficulties in this area. Particular issues were allocation of funds for capital expenditure (often not available in physiotherapy budgets but in ward budgets) and the difficulties of obtaining funding for large equipment items (which, in some examples given was any equipment costing more than £50-100). Charity groups, League of Friends and patient donations were important sources of funding for equipment.

Access to specialist services/clinics such as botulinum toxin and functional electrical stimulation was limited. Wheelchair, splinting and orthotic services were more widely available all or most of the time (between 65-80%). According to the respondents, the waiting times for assessment for splinting and orthotics were generally less than three months (80-82%). For wheelchair services, 56% experienced patient waiting times of less than three months while 20% reported that patients waited between 3-6 months for assessment for wheelchairs. The provision of wheelchairs and specialist seating appears to be problematic.

FREQUENCY DISTRIBUTION OF STAFFING LEVELS: OVERALL AND BY SERVICE TYPE (INPATIENT SERVICES AND OUTPATIENT SERVICES)

Staffing FTE	General (n=226)	Inpatients (n=126)	Outpatients (n=81)
<1	14	3	10
<3	72	30	35
<5	62	53	22
<10	57	25	12
10+	21	15	2

Table 2

Staffing Level

226 completed the question about staffing levels in their neurological service. There was large variation in staffing levels with the lowest level reported being 0.2 of a full-time equivalent post (FTE) and the maximum level being 28 FTE. 58% of respondents reported that there had been no changes in staff posts in the last year and 40% reported that services were not fully staffed. In relation to temporary/locum staff, 9% reported that some staff were currently employed on locum contracts of less than three months. However, 56% of respondents indicated that there was no budget to employ temporary staff to fill vacancies with a further 22% unsure whether there was a budget available or not.

As expected, inpatient and outpatient services showed different staffing patterns (see *Table 2*). Firstly, the majority of outpatient services had less than 3 FTE posts. Secondly, indications were that the skill-mix was different and there were fewer junior and senior II posts in neurological outpatients. For example, in inpatient services, the average FTE post for junior staff and clinical specialists was 1.29 ± 0.8 FTE and 0.78 -± 0.53 FTE respectively whereas in outpatient services, the equivalent values were 0.81± 0.45 FTE and 0.72 ±0.42 FTE respectively. In both services, it was notable that fractionated posts occurred more frequently at staff grades such as extended scope practitioners. In *Figure 2*, it can be seen that 16% of senior II posts were less than 1FTE in comparison to 46% of clinical specialist posts. However, it is not possible to fully ascertain whether these staff are working part-time or have a split post that involves them working in other services. It is likely that both scenarios exist.

NORMALISED FREQUENCY DISTRIBUTION OF FULL TIME EQUIVALENT POSTS AT VARIOUS STAFF GRADE

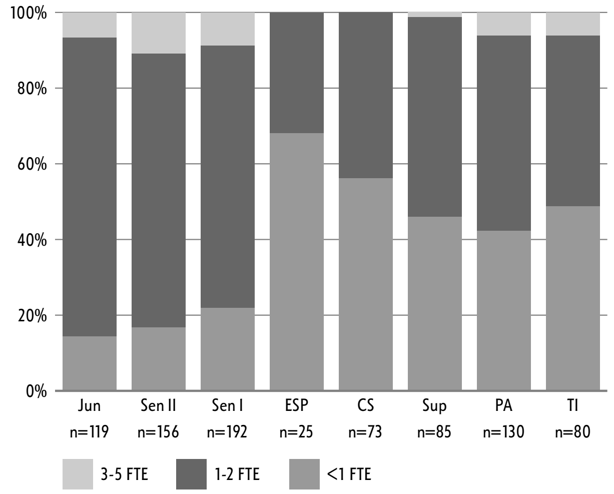

Figure 2

ACPIN committee members are often asked about physiotherapy staffing levels for neurological rehabilitation units and skill-mix balance. In this analysis, estimates of staff to beds ratio have been calculated on the basis of the information provided. One of the difficulties with this calculation is that we cannot be sure that the staffing levels cited for neurological services in the survey relate directly to rehabilitation units only. To address this issue, the estimation was based on the responses of those who worked for more than 50% of their time in stroke or specialist rehabilitation units (n=60). The average number of beds per staff member was 6 ± 3 beds. The estimated skill-mix was one junior/senior II staff, 0.5 physiotherapy/rehabilitation assistants and 0.25 senior clinician (Senior I/clinical specialist etc).

Members Opinions of Neurological Services

Overall, 41% of respondents felt the provision of physiotherapy for stroke patients by neurological physiotherapists had improved, 36% felt it had not changed and 17% did not know. Those involved predominantly in stroke services felt more positive with 57% stating that services had improved. 43% of physiotherapists working in inpatient services reported that provision had improved in contrast to 37% of outpatients. The length of time working in neurological services appeared to influence opinion. 55% of respondents with less than 5 years experience thought provision was improved whereas 32% of respondents with 5 to 10 years experience and 41% of respondents with more than 10 years experience thought provision had improved.

In relation to other neurological conditions, 16% felt it had improved, 59% felt it was unchanged and 20% did not know. Only 10% of those working in in-patients felt that provision had improved but those with 5-10 years experience and those working in outpatients felt more optimistic (both groups: 20% improved). In comparison to their opinion of the provision of physiotherapy for stroke patients, respondents were less favourable about provision of physiotherapy for patients with other neurological conditions. Changes that physiotherapists wanted to see were improved and timely access for patients, better co-ordinated and integrated care and regular review for patients with neurological conditions.

Summary

This survey has been a large undertaking for the ACPIN committee and there is still a lot of work to do to complete this activity. To date, the most notable aspects of the information reported are the most obvious; the large variation in services across the country and the fractionation of services. A large number of respondents reported that they were involved in more than one type of service and treated patients with a range of neurological conditions. With 40% reporting that services are not fully staffed, this situation is perhaps not surprising. In relation to the working environment (ie space and equipment) the key question is what is acceptable. Though pillows were available all or most of the time in 90% of cases, is it acceptable that pillows were available all the time in only 64% of cases? The problems reported in provision of neurological physiotherapy services are multifaceted. Identification of some key factors that should addressed will be our next task in this activity. We will keep you informed and if you want to comment about any of the above, please contact your regional representative.

RESEARCH QUESTIONNAIRE 2004 UPDATE

Research Subgroup

As many of you may have noticed, we have not included a research questionnaire with your membership form for 2005 in this issue of *Synapse*. The initial plan for this activity was to circulate an annual research questionnaire with the membership form for three consecutive years and consider repeating the activity again in about three years. With the rate of change in our professional practice and the workplace, it is not always clear whether the effects are beneficial or not. The research questionnaire has been one tool that ACPIN has adopted to look at research advancement within the membership. We would like to thank you once again for your support by completing and returning the questionnaire in 2004.

We received increased numbers of forms this year: 582 to date, with more still coming in. The increase can be explained by a small amendment to the research questionnaire form in 2004. We decided to include the question on research status on the research questionnaire that, in previous years, was included on the membership form as there were difficulties integrating the information from both forms. Members were asked whether they were previously, currently, planning to be or not involved in research. 16% of respondents indicated that they were previously involved in research, 16% are currently involved, 27% are planning to be and 41% are not planning to be involved in research in 2004.

Section 1 was completed by 235 people of whom 86 were previously, 81 currently, and 25 planning to be involved in research. This section explored research subjects, areas and methodology. *Table 1* (overleaf) summarizes the results for 2004 and 2003. Similar results were observed in 2003 and 2004 overall but those currently involved in research show some variation, notably in research subject and methodologies applied.

Section 2 looked at funding and post-graduate training of those currently involved in research. Of the respondents this year, 62% were employed in the NHS and 23% in Universities. 47% received funding to conduct their research which compares unfavourably with the reported 58% of 2003. The majority (31%) were funded by charity organisations with employers funding 20% of the respondents in this section. 56% had applied for their funding and 50% had or were studying for a further degree.

Table 2 (overleaf) shows the postgraduate qualifications of those involved in either funded or unfunded research. Included in this table are the figures from the 2002 and 2003 survey. In 2004, there continues to be an increase in percentage of funded researchers either studying for or having formal postgraduate qualifications. When qualifications are considered together, 27% of funded researchers and 40% of non-funded researchers do not hold or are not studying for a further qualification.

Section 3 asked those intending to get involved in research about timing, funding and general reason for their research. 157 individuals indicated that there were intending to get involved in research. The results were similar to 2002 and 2003. 21% had intentions to be active within 6 months, 18% within 6-12 months but 52% did not have a known schedule for their research. 43% indicated that their research would be funded, 24% would not and 33% did not answer the question. Most (48%) would do their research as part of work or as part of an educational course (35%).

In section 4, we asked members to comment about their involvement in research in 2003. The percentages for being previously, currently, and planing to be involved in research are similar to those for 2004 given above.

RESEARCH OF ACPIN MEMBERS – SUBJECTS, AREAS AND METHODOLOGIES

Top three items (%) for	2003 all respondents	2004 all respondents	2004 currently involved
Research Subject	Stroke (45) Multiple Sclerosis (14) Other (14)	Stroke (44) Multiple Sclerosis (16) Other (13)	Stroke (44) Multiple Sclerosis (16) Acute Brain Injury (10) Spinal Cord Injury (10)
Research Area	Interventions (40) Outcome measures (23) Service delivery (19)	Interventions (41) Outcome measures (23) Service Delivery (20)	Interventions (47) Outcome measures (27) Service Delivery (14)
Research Methodology	Experimental (17) Single case (17) Survey (16)	Survey (22) Single case (19) Experimental (19)	Experimental (27) Single case (18) Survey (17) RCT (17)

Table 1

POSTGRADUATE QUALIFICATIONS OF CURRENTLY ACTIVE RESEARCHERS

		Funded research			Non-funded research		
		2004	2003	2002	2004	2003	2002
Registered for a further degree	No	45%	67%	60%	56%	64%	55%
	MSc	32%	15%	23%	40%	31%	33%
	PhD	23%	18%	16%	4%	5%	5%
Hold a further degree	No	66%	57%	73%	80%	73%	72%
	MSc	27%	31%	18%	20%	23%	22%
	PhD	7%	12%	6%	0%	4%	3%

Table 2

A sizable proportion of respondents (41%) were new members. Within each category (previously, currently and planning to be), about 30-35% of respondents changed their status. For example, of those currently involved in research in 2003, 70% were still currently involved, 10% were now previously involved and 20% were planning to be involved again. In relation to those planning to be involved, 78% were still planning to be involved. This contrasts with 54% of respondents in 2003 and 39% in 2004 who planned to start their research within one year.

In view of the information we have received over the past three years, it is apparent that there is a healthy interest in research among the ACPIN membership but there are many obstacles to achieving research ambitions. When questioned this year, between 70-80% of those previously and currently involved in research achieved their ambitions in contrast to 40% of those planning to be involved in research. Time and funding are two of the factors that have been highlighted by members. Research training and support networks are also key issues. The Research Subgroup will be considering these issues in future planning.

0101010101010101010101010101010101010101010 **STATS NOTE** 101010101010101010101010101010101010101010

MORE ON THE MODE

The MODE is another useful measure of central tendency used in descriptive statistics, along with the mean and the median. However, unlike the mean it can be used with data that does not have a specific numerical value. The mode is literally the value or thing which occurs with the **greatest frequency** in a set of data - not the frequency of the most numerous variable or score, but the actual level or name of that variable itself. There can be more than one mode if two or more values are equally common. It can be calculated easily either by hand or using a computer spreadsheet programme.

The mode is most useful when used as a measure with **non-parametric** data. For example, with nominal data it can be used to establish the most popular type of walking aid in a group of MS patients, or the most frequent occupation/age of patients undergoing spinal surgery. With ordinal data the mode can be used to analyse responses from a patient satisfaction questionnaire, where responses to questions such as 'how satisfied were you overall with the physiotherapy treatment you received?' are rated on a 5-point scale, (for example from 1 = totally unsatisfied, to 5 = extremely satisfied).

The mode can also be used with **parametric** levels of measurement but, when compared to the mean it tends to be much less reliable and does not give as much information. The mode is not sensitive to a radical change to many values, but it may also be changed drastically by altering just one value. However, the benefit of the mode over the mean in this context is that if there are extreme scores of data (outliers) it is not so easily distorted by the presence of very large or small scores.

As a rule of thumb, it is generally advisable to calculate the mean if your data allows, however:

- If you have calculated the mean but would like to know 'which one thing occurs the most frequently in your set of data?'
- Or if calculating the mean is not possible then **THE MODE** is the measure to use.

ACPIN RESEARCH BURSARY 2004/2005

We thought it would be timely to remind members about the ACPIN Research Bursaries. The purpose of the award is to encourage research activity among the membership and to assist members undertaking research as part of their current workload or undertaking research as part of an educational course. There are some amendments to the application procedure and the value of the award. Bursaries of up to £800 are available to cover research-related costs.

Awards

- The maximum award allowable is £800.
- Awards will be made to cover research-related costs in relation to a specific project,eg equipment; materials/consumables; specialist software; travel expenses.
- Awards will not be granted to cover the following: course fees, computers, staff time (secretarial support of data entry)

Eligibility

- Applicants will be full members of ACPIN of at least two years standing.
- Applicants will be resident in the UK.
- Applicants will be planning to or currently involved in research.
- Research must be related to physiotherapy for neurological conditions.
- Members conducting research as part of an educational course are eligible to apply for support.
- Applicants are expected to be the active participant in the proposed project.
- Applicants cannot apply for more than one bursary.

Application procedure

- Applications for the award must be submitted on the standard application form (available published in *Synapse* or can be obtained from Mary Cramp – the Honorary Research Officer).
- Applications will be considered twice annually. Completed application forms should be received by 1st December or by 1st June for consideration at the National Committee meetings in January and July respectively.
- An application once submitted may only be re-submitted upon invitation.

Applications will be considered in competition bi-annually. Completed applications will be considered and graded independently by members of the Research Subgroup, ACPIN National Committee. Recommendations for awards will be reviewed by an independent expert referee. Awards will not given automatically for each competitive round. Applicants will be informed of the decision of the committee within two months of the application deadline. The decision of the Committee is final.

Terms and conditions

1. Awards are made on the understanding that the investigations comply with ethical and safety requirements of the involved institutions. Evidence of ethical approval and insurance arrangements may be requested.
2. Bursaries must be used solely for the purposes set out in the application procedure. Any changes in proposed expenditure must be agreed to by ACPIN. At the end of the research project, any remaining balance should be returned to ACPIN.
3. A summary of expenditure accompanied by receipts (where appropriate) will be required.
4. ACPIN must be notified of any further changes in the proposed project e.g. timescale etc.
5. Recipients of a research bursary will be required to produce a report for Synapse on completion of the research project. The report will be expected within six months of completion of the project.

ACPIN DAY CONFERENCE

"Hands on" neurophysiology

Bridging the gap between research and clinical practice

Saturday 13th November 2004
National Hospital for Neurology
and Neurosurgery London

Abstracts and biographies

LECTURE 1

Clinical application and current developments in neurophysiology

Margaret Mayston PhD, MSc, BAppSC, MCSP Lecturer, Department of Physiology, University College London & Therapy Adviser, Bobath Centre London.

Neurophysiological techniques have enabled an understanding of CNS function to emerge over many years. At the middle of the last century the brain was considered an organ of reaction, and that CNS function was largely controlled by reflexes. We now know that the brain is proactive, reactive, adaptive, and able to be modified by behavioural experience or as a result of pathology. Various techniques have been developed, some of which measure activity (electromyography: EMG), test by stimulation (reflexes, transcranial magnetic stimulation: TMS), and others, particularly imaging techniques, which can determine how the CNS behaves during functional tasks.

A well-known way of investigating activity in a muscle is the use of EMG recording. This is useful to determine how active muscles are and when they are activated, but cannot be used comparatively between subjects or recording sessions unless the records are normalised and/or quantified in some way, for example rectification and averaging. EMG recordings can be used to carry out cross correlation analysis developed from studies in aplysia (Moore, et al 1970), and applied extensively to human studies to determine patterns of neural innervation to motoneurone pools (MN) innervating the muscles of interest (Bremner et al 1991; Farmer et al 1997). In the 1980s TMS replaced electrical stimulation as a painless way of investigating the cortex, particularly activity in the corticospinal projection (CST), determining its distribution and conduction velocity and changes during development and in pathology. The cutaneomuscular reflex (CMR; Jenner & Stephens 1982) is a simple reflex which can reveal information about activity in spinal cord and transcortical pathways. It has been used effectively to determine distribution of sensory and motor pathways and areas of CNS processing. In conjunction with the use of somatosensory evoked potentials (SEP), information about sensory pathways can be obtained.

Other techniques such as PET, fMRI, SPECT have enabled a picture into the functioning nervous system, and more recently the use of EEG-EMG coherence analysis has opened another way of 'imaging' the CNS during functional tasks (Miyai et al 2002; Farmer et al 2004). While neurophysiological techniques are very useful, they are probably more clinically relevant if viewed in conjunction with measures of function and biomechanics. In this presentation various techniques will be discussed and applied to studies of the phenomenon of activity overflow in the upper limb.

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Margaret Mayston trained at the Melbourne school for Physiotherapy in 1973 (Dip Physio; BAppSc, Physio) and subsequently worked at the Royal Children's Hospital in Melbourne before coming to the UK. She has been an 'on/off' physiotherapist with the Bobath Centre since 1979 treating children and adults. Completed an MSc in Applied Physiology in 1990 (King's College London) and PhD in 1996 (Department of Physiology, University College London), followed by a three year post-doc. Currently lecturer in the Department of Physiology at University College London co-ordinating an MSc in Neurophysiotherapy, carrying out research and also working as therapy adviser at the Bobath Centre for children with cerebral palsy and adults with neurological disability. Research interests include: Plasticity of central motor pathways and patterns of upper limb recovery following stroke in humans and its relevance to physiotherapy management. Temporal coding in the nervous system. Human motor development and its relevance to understanding and management of motor disorder of cerebral palsy.

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LECTURE 2

Neurophysiological tools to investigate changes following stroke.

Martine Nadler PhD MCSP

Neurophysiological tools can be used to investigate cortical changes which accompany recovery of function following CNS damage. In addition, they may be of benefit in predicting the prognosis and functional outcome for patients. In this talk, the use of two neurophysiological tools will be discussed for patients following stroke: transcranial magnetic stimulation and cutaneomuscular reflexes.

Transcranial magnetic stimulation (TMS) works by positioning a coil over the motor cortex and delivering a short magnetic pulse. This induces a current within a relatively focused area of the motor cortex and will excite the fast cortico-spinal connections. Provided that the stimulus is of sufficient intensity, this excitation will cause a contralateral muscle or group of muscles to contract (which muscles will depend on the part of the motor cortex being stimulated). Using either surface or needle electrodes, the motor activity can be recorded as a motor evoked potential and these can be used to create a motor cortical map.

Liepert's group has carried out a series of TMS studies examining the cortical map in stroke patients before and after two weeks of constraint induced movement therapy (CIMT). TMS was delivered to the motor cortex (stroke and non-stroke hemispheres) to identify the sites which, when stimulated, produced a motor evoked potential in the abductor pollicis brevis thumb muscle for each patient. It was shown that after two weeks of CIMT, the number of active cortical sites and area representation of the abductor pollicis brevis thumb muscle was increased and shifted on the stroke-affected hemisphere (Liepert et al. 1998). These cortical map changes were shown to accompany functional improvements (Liepert et al. 2000), and occurred after CIMT was carried out in addition to conventional therapy, rather than after conventional therapy alone (Liepert et al. 2001). The authors hypothesised that these changes in cortical representation were due to increased cortical excitability. This may result from decreased activity of local inhibitory interneurones enabling unmasking of existing synaptic connections and/or increased strength of existing connections. While it is not yet known whether the restraint or the intense therapy produces the functional improvements, TMS shows the cortical changes which accompany clinical recovery.

Cutaneomuscular reflexes (CMRs) may be used to investigate changes in central nervous system pathway activity. Voluntary EMG activity is recorded from a hand muscle while, at the same time, the digital nerves are stimulated electrically. This response is typically triphasic in healthy adults. There is an initial increase in ongoing voluntary EMG, E1, followed by a decrease, I1, and a second increase, E2. The earliest response, the E1 component, is produced by activity in spinal pathways (Jenner and Stephens 1982) and the I1 and E2 components are believed to be transcortical with both components requiring the integrity of the sensorimotor cortex, dorsal columns and corticospinal tract (Mayston et al 1997).

The acquisition of a novel motor skill with the non-dominant hand resulted in a selective increase in size of the I1 and E2 reflex responses mediated by the cortical pathway (Nadler et al 2000). In addition, novel reflex responses were recorded in hand muscles involved in learning the new skill. The findings suggest that the cortical representation of these hand muscles may have increased in size and/or may have come to lie closer together. Subsequently we decided to undertake a two year longitudinal study to investigate whether the sizes of CMR components changed with time following stroke and whether there were accompanying changes in function. We recruited ten patients within one month post-stroke and investigated both CMR responses and functional recovery. Overall the CMRs did not change significantly over time. Results suggested that significantly larger E1 spinal responses, recorded from hand muscles on the stroke side which occur as soon as the patient can produce flickers of EMG, together with absent cortical responses, appear to be related to a poor functional outcome (Nadler et al 2004).

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Martine Nadler currently works part-time at the Bobath Centre London treating adults with neurological disabilities. She completed her PhD in 2000 at the Dept of Physiology, University College London investigating changes in central pathways in adults following stroke. Her current interests lie in the recovery of upper limb function.

LECTURE 3

Relationship of neurophysiology to function: The application of Transcranial Magnetic Stimulation to recovery following stroke.

Allie Turton

Transcranial magnetic stimulation (TMS) is a non-invasive and painless technique that allows researchers to stimulate the cortex . It can be used to investigate the excitability and connectivity of corticospinal pathways and has helped to elucidate mechanisms of recovery following stroke.

Changes in EMG responses to TMS in recovering stroke patients have shown differing patterns of reorganisation in recovery of hand function and in swallowing. Reorganisation of the corticospinal tract descending from the damaged hemisphere is important for activation of recovered hand function. However recovery of swallowing appears to depend on compensatory reorganisation in the undamaged hemisphere.

Recently high-frequency electrical stimulation of the pharynx has been shown to drive cortical plasticity that was strongly associated with improved swallowing in dysphagic patients . It is thought that a mechanism similar to long term potentiation may be involved in generation of these effects. In a similar way it may be possible to improve hand function and motor learning in healthy subjects and in people with stroke by increasing the excitability level of the motor cortex using TMS. Rapid rate TMS (rTMS) applied to the cortex has been shown to increase excitability beyond the period of stimulation. Future studies combining rTMS and motor training are planned to explore the potential of this technique as a tool for stroke rehabilitation.

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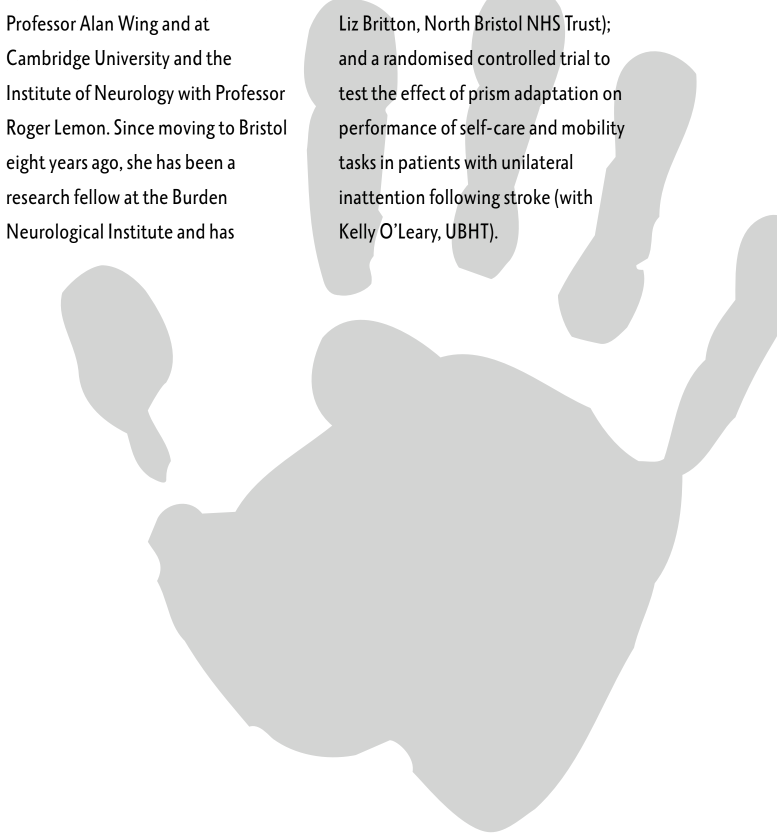
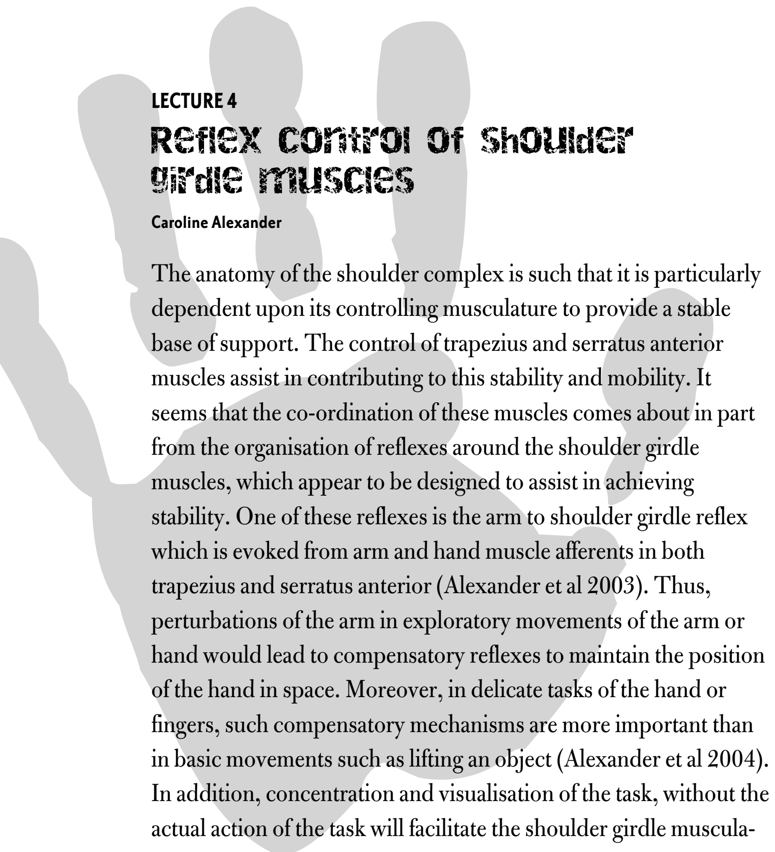
Ailie Turton's background is in Occupational Therapy. She has worked in Stroke Rehabilitation Services at Addenbrookes Hospital Cambridge and at Frenchay in Bristol. She has twenty years of experience in stroke research. Projects have predominantly involved investigation of motor control and recovery of the upper limb following stroke. She has worked at the MRC Applied Psychology Unit, Cambridge with Professor Alan Wing and at Cambridge University and the Institute of Neurology with Professor Roger Lemon. Since moving to Bristol eight years ago, she has been a research fellow at the Burden Neurological Institute and has recently joined the Department of Experimental Psychology at Bristol University.

Current projects include: An evaluation of a repetitive practice scheme to improve sit to stand performance following stroke (with Liz Britton, North Bristol NHS Trust); and a randomised controlled trial to test the effect of prism adaptation on performance of self-care and mobility tasks in patients with unilateral inattention following stroke (with Kelly O'Leary, UBHT).





LECTURE 4

Reflex control of shoulder girdle muscles

Caroline Alexander

The anatomy of the shoulder complex is such that it is particularly dependent upon its controlling musculature to provide a stable base of support. The control of trapezius and serratus anterior muscles assist in contributing to this stability and mobility. It seems that the co-ordination of these muscles comes about in part from the organisation of reflexes around the shoulder girdle muscles, which appear to be designed to assist in achieving stability. One of these reflexes is the arm to shoulder girdle reflex which is evoked from arm and hand muscle afferents in both trapezius and serratus anterior (Alexander et al 2003). Thus, perturbations of the arm in exploratory movements of the arm or hand would lead to compensatory reflexes to maintain the position of the hand in space. Moreover, in delicate tasks of the hand or fingers, such compensatory mechanisms are more important than in basic movements such as lifting an object (Alexander et al 2004). In addition, concentration and visualisation of the task, without the actual action of the task will facilitate the shoulder girdle musculature (Alexander et al, 2004). To investigate whether this facilitation is caused by a generally heightened state of concentration or concentration upon the specific task, further investigations have just been completed. Here, concentration away from the task, distraction, was compared to a control task. It seems that, unlike concentration upon the specific task, distraction does not facilitate this reflex. This suggests that the concentration must be directed to the particular task that requires a stable base of support for the hand, than a general state of heightened concentration.

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Caroline Alexander qualified as a physiotherapist in 1987 from Guy's Hospital School of Physiotherapy. She has been specialised in the treatment of musculoskeletal problems for the last 14 years and has worked as a physiotherapist in various hospitals in South West London. She did an MSc in advanced musculoskeletal physiotherapy in1994 at University College London. Since this time she has been a lecturer and examiner of undergraduate and postgraduate students, a clinical specialist and researcher completing her PhD at UCL in January of 2002. Her PhD was entitled *Reflex control of shoulder girdle muscles in humans* and her grants and publications reflect this area of work. Caroline now continues her research into the motor control of shoulder muscles in collaboration with UCL as a research physiotherapist and clinical specialist at Hammersmith Hospitals NHS Trust. Caroline is a member of the clinical effectiveness and research committee of the CSP and is an alternate to council as the research representative.

LECTURE 5

Gait retraining following stroke: brain mechanisms underlying improvements in function

Dr Marko Bogdanovic

Functional recovery following stroke and other injuries to the nervous system is mediated by numerous distinct biological processes. The beneficial effects of physical therapy on performance in the subacute and chronic phases post-stroke are thought to depend on reorganization of function within the central nervous system, particularly in the cerebral cortex. We have chosen to study the mechanisms of performance gain brought about by gait retraining using partial body-weight support (PBWS) treadmill ambulatory therapy in the chronic phase post-stroke. This technique has been shown to be effective at improving gait function in chronic stroke and shows promise in other neurological conditions. Subjects were recruited who were ambulatory but had residual gait impairment following a single subcortical ischaemic stroke more than six months previously. Cerebral functional organization was investigated using functional magnetic resonance imaging with active and passive foot movement conditions, taking the stroke and the non-stroke side in turn. Subjects underwent three scans prior to a period of treadmill training and one scan afterwards. Each received three sessions of PBWS treadmill training (each of 4 x 5 minutes) per week for at least four weeks. Unweighing was applied to permit the subject to walk at a fast pace (target 2mph) with a normal or near-normal gait pattern. Foot placement and heel-strike were monitored by a therapist and manual correction applied as necessary during walking. Interim behavioural and imaging results from the first seven patients are presented.

Marko Bogdanovic works on stroke recovery and is pursuing a project looking at the functional organization of working memory in myotonic dystrophy.

Publications

Bogdanovic M, Kidd D, Briddon A, Duncan JS, Land JM (2000) *Late onset Ornithine Transcarbamylase Deficiency Mimicking Complex Partial Status Epilepticus* Journal of Neurology Neurosurgery and Psychiatry 69 pp813-815.

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Reviews

articles, books, courses

Reviews of research articles, books and courses 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.

A EVALUATING THE ROLE OF BOTULINUM TOXIN IN THE MANAGEMENT OF FOCAL HYPERTONIA IN ADULTS.

Davina Richardson, Geoff Shean, David Werring, Margi Desai, Susan Edwards, Richard Greenwood, Alan Thompson in: *Journal of Neurology, Neurosurgery and Psychiatry* (2000) 69 pp499-506

Article reviewd by **ACPIN Wessex region**

Title Concisely reflected the content of the article.

Authors Authors were listed but did not state their professions or clinical experience.

Overview This study was realistic to an outpatient BTX-A clinic. A wide variety of pathologies, time intervals between pathology and injection and insensitive outcome measures for this patient group limits drawing statistical significance.

The authors did conclude that BTX-A reduced tone and increased range of movement but could only demonstrate this in the lower limbs.

Abstract The abstract was a good synopsis, it was, however, quite long and gave a lot of detail about the study. If time was limited most information could be gained through reading the abstract alone.

Introduction The introduction was very detailed covering what is spasticity, why EMG is advisable when injecting botulinum toxin (BTX-A) and a discussion surrounding the limited evidence available for adult spasticity management.

There was clear reasoning for the study whilst building on past research, in particular their planning and learning from previous studies errors. However, they did not clearly state the aims of the study within the introduction, although the abstract did state their objectives.

It may have been clearer to state a hypothesis or aim of the study, but on reading the article it was clear that they were comparing BTX-A and rehabilitation/management to rehabilitation/management alone.

Method A prospective, randomised, double-blind placebo controlled parallel group trial was carried out, this would ensure internal validity.

The rationale for inclusion/ exclusion was stated clearly and 52 patients were divided into four groups for upper limb and lower limb placebo and treatment groups. Interestingly the study hads a wide range of pathologies and varying intervals between injury and treatment.

Ethical approval or considerations were not commented on.

Although the authors chose outcome measures that reflected impairment, activity and participation they did not state if they were valid, reliable or sensitive but they could be replicated, as they are well known. Is this why they were chosen?

Percentage range of movement (ROM) was an interesting and statistically useful way of recording differences in ROM to compare different joints, however it wasn't made clear how they defined normal ranges.

The authors did not comment that a pilot study had been completed prior to the trial.

In our opinion, this study could be replicated by experienced clinicians in administrating BTX-A with EMG guidance.

The authors commented that they successfully blinded the researcher but would the physiotherapist providing the rehabilitation use clinical reasoning to determine that the patient had been injected and therefore alter treatment for that patient?

Results The outcome measurements were clearly displayed in graphs.

The p-value was statistically significant for Ashworth scores and Rivermead leg and trunk assessment, but there was no comment as to the clinical significance.

The timescale was twelve weeks. It would have been interesting to measure a longer timescale to see the longer term effects.

Discussion In the discussion the results were discussed and expanded upon.

The authors recognised that the use of a wide variety of pathologies and injection sites made statistical analysis difficult.

The authors are good at looking at the weaknesses within this study and consider that further study is required, especially looking at subjective and objective outcome measures as they stated that 'the standardised measures were insensitive to change compared with the subjective rating results'.

The objectives stated in the abstract were met but it was difficult to draw specific conclusions about the clinical benefits of BTX-A.

Conclusion The authors however concluded that BTX-A has a statistical effect on focal spasticity in the lower limb but it was difficult to obtain functional improvement.

They highlighted that further studies with more sensitive measures where needed.

This article is useful supporting evidence for access to BTX-A as an adjunct to physiotherapy techniques for specific patients.

References The article was supported by 24 references.

A THEORETICAL ASPECTS OF GOAL SETTING AND MOTIVATION IN REHABILITATION

R Siegert, W Taylor in *Disability and Rehabilitation* (2004) vol 26 no 1 pp1-8

Sally Boa, Speech and Language Therapist and **Emma Forbes**, Physiotherapist, Area Rehabilitation Team, Stirling Royal Infirmary, Stirling, Scotland

Overview This review article gives an overview of goal setting in rehabilitation and an introduction to three theoretical models to be taken into consideration during the goal setting process. It was reviewed as part of a journal club in a multidisciplinary rehabilitation setting.

CRITICAL REVIEW

Abstract The abstract highlights three models from the field of social cognition and argues for closer collaboration between social cognition theorists and rehabilitation practitioners. It concludes that theorists and practitioners have much to gain from this collaboration.

Summary The scene is set regarding the development of goal setting as a key component of rehabilitation. This is done primarily by giving a comprehensive review of current literature. This included a summary of Wade and Dejong's review in 2000, Barnes and Ward 2000 and the concept of SMART goals as described by McLellan in 1997. This was difficult to read but the idea of motivation, which was introduced to us in the abstract, continued to hold our attention resulting in us continuing to read on.

The article highlighted some key issues, i.e. that goal setting is based on a world view not necessary shared by patients and professionals, that patients understanding of goal setting is not always taken into account and the importance of the environment on peoples priorities. These issues even though felt not to be clinically significant were relevant enough to promote discussion.

The idea of linking motivation and goal setting was introduced and set the scene for describing the three models: Deci and Ryan's self determination model, Emmon's work on goals and personal strivings and Karniol and Ross' discussion of temporal influences on goal setting. Clinical examples were given to illustrate how the models could be used as a framework for goal setting and how goals can be made more relevant and motivating for individuals.

All three models gave food for thought and practical ideas to consider motivation and its importance in rehabilitation in addition to ideas for further research.

This article is well worth persevering with and we recommend it to anyone involved in the highly complex process of goal setting.

C USING RESEARCH EVIDENCE TO IMPROVE THE UPPER LIMB MOTOR PERFORMANCE OF PEOPLE WITH STROKE

Evening lecture
Thursday 1st July 2004
Western General Hospital, Edinburgh
Tutors: Annie McCluskey, Karl Schurr

Emma Forbes, Area Rehab Team, Stirling Royal Infirmary

Annie McCluskey is an occupational therapist and Karl Schurr is a physiotherapist working in Sydney, Australia. They both lectured to various allied health professionals and students on the above subject. It was organised by ACPIN Scotland.

The learning outcomes for the lecture were to:

- recognise strengths, limitations and biases inherent in certain research designs
- recognise personal biases
- name and follow up selected research studies, particularly systematic reviews and RCT's relevant to neuro rehab
- identify strategies to help maintain knowledge currently in this field
- reflect on treatment currently offered to patients

These objectives were achieved by an overview of how to look at the results and statistics, including p values, treatment effects and confidence intervals, presented in research articles. This was then illustrated by examples of research already published.

The different types of research and the influence each can have on the results were discussed. This also included being aware of any personal biases we may have influencing our opinion when reading articles.

Information was also given on evidence databases and subsequently the current evidence obtained from these on exercise therapy, constraint induced therapy, functional electrical stimulation, hand splinting, supports/strapping and decreasing shoulder subluxation.

The examples given and subsequent discussion aided to make this evening an extremely informative session shedding light on areas such as interpreting results and stimulating enthusiasm for reading research articles and even carrying out research.

The reviewing of evidence continues to raise the importance of ensuring our input is clinically significant and worthwhile.

This was a thoroughly worthwhile session.

Regional reports

KENT

Lisa White
Regional Representative

Despite a lot of hard work behind the scenes within Kent ACPIN over the last year there have been few fruits to show of it in the past. The committee now stands at four members and we now have some exciting study days planned for the forthcoming year.

On the 3rd November 2004 there will be a full-day on the shoulder. This will cover such topics as anatomy, biomechanics, postural control and the shoulder, strapping and acupuncture. This will be held at the Sittingbourne Memorial Hospital.

On the 15th January 2005 we are delighted to welcome back Dr John Rothwell for another study day at the Chatham Historic Dockyard venue. The subject will be the Basal Ganglia, cerebellum and movement disorders, with a practical bias.

Our AGM for 2005 will be an evening event in February/March. Janice Champion will be leading a session on the gym ball. The AGM being held afterwards. Venue and exact date to be confirmed.

For any further information regarding these courses please contact myself or the membership secretary Simon Eason on simon.eason@nhs.net

LONDON

Sandy Chambers
Regional Representative

Since the Winter report, the London Regional Committee has been relatively quiet but diligent. The evening lecture series continues and has been fortunate to host extremely interesting and thought provoking speakers. As always, we are grateful for all the speakers' time and contribution to the continuing professional development of our members and guests. The remainder of this year's schedule is:

- September 14 (pm. *Conversion Disorder* Rachel King and Susan Hourihan (The National Hospital for Neurology & Neurosurgery)
- October 12 (pm) *Cervical Dystonia* Gita Ramdharry and Professor Lees (The National Hospital for Neurology & Neurosurgery)
- November 9 (pm) *The role of physiotherapy in maintenance of MS patients* Speakers TBA (St Thomas' Hospital)

We will be working toward next year's CPD schedule shortly and would be grateful for input from all members. The attendance at evening lectures has dropped off considerably in the last eight months. A proposal has been put forward to change the format of the lectures from once monthly evening lectures to either half-day formats every three months, or to having lectures every two to three months to better suit our members' CPD needs.

Louise Platt has been participating in the South East Physiotherapists in Neurocritical Care Group. This is a new network initiated through the AHPs in Neurocritical Care Forum set up by the Modernising Healthcare Agency. This follows the continued focus of the Health Service looking at critical care nationwide, and more recently at neurosciences. The local and national networks are hoping to develop stronger links with ACPIN to promote best practice in neurocritical care.

As is usual for a busy, and transient, region such as London, we are always happy to share the work and would be pleased to hear from members who would like to join the Committee. If you are interested in supporting the London Region's work, or have ideas or comments about next year's CPD schedule, please contact myself, or Louise Platt.

MANCHESTER

Louise Rogerson
Regional Representative (acting)

We have had a number of well attended lectures so far this year, and we are currently working on next year's programme. We hope members will continue to support our programme through until the end of the year. The upcoming lectures include a patient demonstration and follow up workshop.

We would like to take this opportunity to thank all our speakers for this year. There have been excellent numbers of attendance at some of our lectures, including driving after neurological injury, the ankle foot cast, and biomechanics of gait. As usual evaluation forms have been completed and the feedback is being used to guide next year's programme. Thank you to our members for supporting us at lectures and for completing the feedback forms.

The poster presentations have gone ahead as planned, and there have been some excellent contributions. It's good that ACPIN meetings can facilitate information-sharing between local services, and to see what work is happening in our region.

We are currently in the process of organising a course which will be a practical normal movement workshop for a half day.

As a committee we would love to hear from our members regarding evening lectures or courses. If you have any ideas for lectures, or would like to present something yourself, either as a lecture or a poster, please contact one of the committee.

MERSEYSIDE REPORT

Joanne Jones
Regional Representative

Overall membership continues to flourish at a healthy 51, however our committee has been 'downsized' by the recent resignations of Andrea Martin and Helen Evans – whilst we thank both Andrea and Helen for all their hard work and wish them all the best for the future, we are keen not to let the grass grow and would welcome budding committee members particularly from further afield to strengthen links across the region.

Our AGM in March was combined with a clinical workshop facilitated by Sharon Williams and was, not surprisingly, well attended (a cunning plan on our part!) The Ataxia Course by Lynne Fletcher held in June proved both very popular and very successful, attendees providing constructive feedback which we will endeavour to act upon should we schedule a re-run at a future date. The remainder of our 2004 programme is as follows:

- September 21 *Polyneuropathies Study Day*
- October (date to be finalised) *Spinal Injuries* evening lecture by Alison Batchelor.
- November 3 *Vestibular Study Day* Pam Mulholland.

Looking to 2005, we are very pleased to be hosting an 'Acupuncture in Neurology' course with Val Hopwood in January or February (dates to be finalised). Be sure to keep an eye out for more information in *Frontline* as places on this course are limited and will undoubtedly be in great demand. Other topics to be covered in 2005 include Splinting – Introductory and Advanced and FES interspersed with evening lectures and workshops.

And finally, 'new members, new outlooks, new ideas are always welcome!' (Jones, *Synapse* Spring 2004!)

NORTHERN REGION

Julia Williamson
Regional Representative

The Northern region continues to enjoy a varied programme of courses. It is always pleasing to run courses requested by members and musculo-skeletal techniques for Neuro-physiotherapists by Heather McKibbin proved extremely popular.

Pain & NEURODISABILITY

ACPIN National conference & AGM 2005

Saturday 5th March 2005 • Hilton Hotel, Northampton

Topics to be addressed include:
Mechanisms of pain and the CNS,
The cognitive content of the pain experience,
Thermosensory perception and
Low back pain in neurology amongst others

See *Frontline* or go to www.apin.net
in the New Year for applications

ACPIN

Unfortunately, an afternoon course covering case report writing had to be cancelled due to lack of interest, although it is hoped we can run it again in the near future. Pam Mulholland treated us to an excellent weekend on 'Posture and Balance' in July, which was extremely well received. The autumn will include an insight into a large multi-centre trial on Stroke and botulinum by Helen Rogers and an MS study day covering updates on projects funded by the MS Society in the region.

The programme for 2005 is taking shape. A 'core stability' weekend is hopefully on offer as is a Parkinson's disease study afternoon. An FES course is planned, as is a Neuroplasticity study day to complement the National course this November. Details will be available via local departments and the CSP. We even have some plans for 2006 but it is probably best to keep them under wraps for now!

Membership in the region is growing steadily, anyone considering renewing is urged to do so, as all courses are discounted for members. The committee is enjoying an influx of new members, although there is always space for more and all of us are keen to hear your ideas for future courses

NORTHERN IRELAND

Siobhan Macauley
Regional Representative

Northern Ireland has approximately 48 members and we always welcome new committee members to help us manage the group effectively and to keep the lecture programme fresh and exciting.

We have had no lecture evenings over the summer months but have a varied programme arranged for September 2004 through to June 2005. We have decided to hold the evening lectures in different venues this year so please consult the lecture programme before starting out. The lectures will continue to be held on the third Tuesday of the month were possible however in order to accommodate some of the speakers this may occasionally change.

Finally we would like to congratulate our two longstanding committee members Roseanne and Gail on the birth of their babies – a rather radical way of trying to get off the committee!

OXFORD

Fiona Cuthbertson
Regional Representative

Oxford ACPIN has enjoyed another prosperous six months, seeing a healthy membership of 54 and many very well attended evening lectures provided by some excellent local talent on a range of topics from the autonomic nervous system and botulinum toxin, to clinical reasoning and applying evidence to clinical practice. I would like to extend a very big thank you on behalf of the committee to all of our 2004 speakers to date, who have provided us with such a varied and interesting programme – Sue Butterworth, Stana Bojanic, Helen Talaga, Sue Edwards, Matthew Koshy, Charlie Winward and Kate Tucker.

Our 2005 programme at the time of writing is in its embryonic stage to say the least!

However we will be sending out flyers with details of individual lectures and courses, and plan to produce a leaflet in the new year outlining the forthcoming year's events. Please also refer to the branch news noticeboard section of *Frontline* where up to date course and lecture details can always be found.

Oxford's committee remains reasonably stable with seven members from Reading, High Wycombe and Oxford. However we would love to hear from you if you are at all interested in becoming a committee member, in particular (but by no means exclusively!) from areas outside those already represented. Also, we always gratefully receive any ideas for topics or speakers – please feel free to let any of the committee know or contact Claire Guy on 01865 737372.

Thank you to all members for their support in 2004 and we look forward to seeing you in 2005.

SCOTLAND

Paula Cowan
Regional Representative

Scotland is doing well. We have had people phoning us up to come on the committee, so we now welcome Wendy Juner, Lynsey Masterton, and Cassie Gibson. Lyndsey has also volunteered to become membership secretary which eases the burden on the regional rep!

We ran an evening lecture this year and had about 60 people turn up which was excellent. It was a MRP/ movement science evening and weekend by Annie McClusky from which we received excellent feedback. Our committee members worked very hard to get the turn out and should be thanked for all their hard work.

Courses still to come:

- October 2nd *Gait* Debbie Strang
- October 9th *Dyspraxia* T. Jackson and P Halliday
- November 5th *Splinting* D Ritchardson

2005 ideas! Feel free to voice your opinion!

- March *Neurophysiology* D Strang
- April *Normal Movement* P Mulholland
- September *Orthotic/Gait lab*
- October *Treadmill*

We continue to encourage feedback from members or ideas for future events. We would also ask members if they would forward email addresses to the regional rep. This would make our life a whole lot easier. Many thanks for a good year so far!

SOUTH WEST

Kirsten Cheadle
Regional Representative

South West ACPIN continues to thrive with a membership of almost 90 this year. We have had a quiet start to the year but have a varied and exciting programme lined up.

The AGM competed with a gloriously sunny Saturday morning but those who came enjoyed an interesting and entertaining talk by Dr Peter Eames on managing challenging behaviour. We had an informative talk and patient demo on FES for the upper limb by Geraldine Mann, which was well received.

Our programme for the rest of the year is almost finalised, with courses to include:

- September 22nd *Gym Ball workshop*
- October 2nd and 3rd *Complex Disability* Sue Edwards
- November 24th *Huntington's Disease*
- January 19th *Tremor in Stroke*
- February *Movement Disorders* Jon Marsden and John Rothwell
- April 9th *AGM* various speakers to be confirmed.

We have also made plans for movement science weekends, a Postural Management course and a spinal injuries study day for 2005/6

All details are posted on our new website – www.southwestacpin.net

A big thank you to Lynsay for organising and managing our site.

As a committee we are based around the Bristol and Bath area but we are keen to spread out to the edges of our large region. If anyone in South Wales or Devon and Cornwall would like to help run a course/ evening lectures nearer home, we would love to hear from you!

SURREY & BORDERS

Sally de la Fontaine
Regional Representative

We have held a mixture of evening lectures and short courses over the last year and attendance has been generally very good.

Our talk from a representative from the Guillain-Barre Syndrome (GBS) association was extremely well attended and the speaker, who has had GBS twice, gave a very useful and enlightening lecture. The Pilates course and normal movement modules were filled quite quickly and the feedback has been very good. We are looking forward to our first lecture from an occupational therapist at our September meeting and hopefully this will be the start of further meetings with NANOT.

We are endeavouring to hold events at various locations across the county and welcome suggestions from members about other suitable venues that we could use in the future.

A plea !

We really do need new committee members though to bring fresh ideas to the running of the branch. There is not too much involved but because two original members have left we are down to five and it would be lovely to share what 'work' there is … so please make contact !

Programme for 2004/5

- November TBA in Frontline *Painful Hemiplegic shoulders*
- February 1st *AGM and Complex disability* Sue Edwards (Frimley Park Hospital)

We shall be meeting soon to organise our 2005 programme so do let us know of any topics, courses and/or speakers you would like us to organise. Better still, why not join us!

SUSSEX

Margaret Hewett
Regional Representative (temporary acting)

Sussex ACPIN continues to enjoy a varied programme of events in different venues. The future programme is as follows:

- November (date to be confirmed) *Strength Training Post Stroke and Aerobic Exercise in Acquired Brain Injury* Mary Cramp and Jane Culpan (Brighton General Hospital)
- February 2005 (date to be confirmed) *AGM and day course on Musculo-skeletal techniques in Neurology* Further details will be in *Frontline*

The previous programme for 2004 has consisted of day courses rather than evening lectures. In February, Laura Buckholtz and Amanda Austin from Stoke Mandeville returned to give a 'fact-packed' and extremely useful course on Incomplete Spinal Cord Injury. In April, there was a half-day workshop on the Gymball with Regine Hill, both of these being held at the Conquest Hospital.

In June, Anthea Dendy gave an excellent study day on 'The Treadmill', which helped christen the newly-installed equipment at Bexhill Hospital.

By the time of publication, there will hopefully have been the planned Study Day at Princess Royal Hospital in Haywards Heath on' An Integrated Pathway for Hemiplegic Shoulder Pain', with Lisa Knight.

Please do not hesitate to proffer ideas for speakers/venues/ topics: contact details of the committee are on the website.

WESSEX

Helen Foster
Regional Representative

The Wessex program over the last few months has included an article review in March, which will be included in Synapse, an excellent presentation by Dorit Hyndman on 'Falls Research in Stroke Patients' (with regional AGM) and 'Hydrotherapy for Neurological Patients' by Jackie Pattman. Unfortunately we had to postpone the 'Posture Management Course' due to lack of interest.

The committee appears to be hitting a baby boom year with Ros Cox (Committee member) expecting a brother or sister for Gemma and congratulations to Naomi Wells (treasurer) who gave birth to baby Jack on the 7th August. We would be delighted to welcome any new members or ideas for local courses or evening lectures .The next ACPIN meeting on the 20th September will be to organise the program for 2004, please contact any of the committee for details.

Thank you to the current committee for all their hard work in producing an excellent programme in 2004.

Programme for the rest of 2004

- November 19th *Early Stroke Treatment Study Day* Helen Foster
- November 24th-26th *Posture Management course* Jo Kileff

WEST MIDLANDS

Liz Cohen
Regional Representative

Membership remains strong with nearly 90 at the last count. 2004 has seen a few changes to the committee but continues to welcome 14 regular members. There have been a few new faces and a few returning to the fold. Linzie Bassett has joined the committee following her time as Chair of National ACPIN. We have recently had a move around of main roles within the committee, Zoe stood down as secretary after many years commitment to the role, handing the envelopes and stamps to Jo and Claire who have returned to the committee following a period of maternity leave and will share the role. Trish has stepped down as treasurer as she takes a maternity break, handing the books to Louise. Many thanks to all those stepping down and those taking on new roles within the committee.

We continue to have a busy timetable for study days and courses. Generally courses have been well attended.

Recent courses have included:

- 28th February we welcomed back Liz Mackay for a stimulating day focusing on neurophysiology and its relevance to clinical practice in the treatment of the upper limb. As ever Liz's course was very well subscribed and received excellent feedback. Our AGM took place during the day.
- In April NICE ran a day for us looking at Conductive Education for Parkinson's Disease that included a demonstration group of PD patients. This was well received.
- In July Janice Champion was welcomed back for the ever-popular gym balls study day which was slightly oversubscribed and comments were very positive.

Remaining programme for 2004

- September 21st Evening lectures *The Patient and Carers perspective after Stroke* Carron Sintler and *Upper Limb Proprioception* Jill Ramsay (The Priory Hospital, Birmingham at 7pm)
- September 25th-26th *Outpatient Techniques in Neurology* Helen Lindfield and Laura Finucane (City Hospital, Birmingham)
- November 13th *Pilates* Kate Fernyhough (Queen Elizabeth Hospital, Birmingham) We are looking to change the date of this course as it clashes with the National Conference. Look out for changes.

2005 programme

Dates and speakers to be confirmed

- February/March We hope to welcome Martine Nadler and to have our AGM
- May *Splinting Course*
- September *Motor relearning*

Thank you for your continued support. We always value your opinions and ideas for future events. Any queries about the courses advertised, suggestions or interest in joining the committee please contact Liz Cohen via email lizcohen@ntlworld.com. Don't forget to renew in January!

■ YORKSHIRE

Caroline Brown
Regional Representative

Another six months have flown by, and Yorkshire ACPIN continues with a few new faces on the committee. They were thankfully recruited at our AGM, where Ray Tallis delivered some excellent lectures.

Other topics have included Fiona Jones on 'Whose confidence is it anyway?' in relation to the treatment of stroke patients, and Anna Jones (not related!) on the Rescue Project. By the time this goes to print we will also have held a day on 'Incomplete spinal injuries' with Lynne Fletcher. To help with travelling for members, these have been organized at different venues around the region (York, Leeds and Huddersfield).

The committee continues to beaver away to finalise the programme for the next six months, which we hope will include both lectures or practical sessions on the MS Guidelines and FES.

If you have any ideas for future lectures or venues please contact me on 01904 725747. It will be great to hear from you. As always all the details of Yorkshire ACPIN events will be sent to each member and advertised in *Frontline*.

Letters

VESTIBULAR REHABILITATION: A REJOINDER

Dr Andrew King Senior Lecturer, Physiotherapy and Diatetics Subject Group, Coventry University

A knowledge of the vestibular contribution to balance is vital in neurological rehabilitation. For this reason I welcome Caroline Greenaway's audit of a vestibular rehabilitation programme in the last edition of *Synapse* (Greenaway 2004). That article raised a number of issues which deserve further attention. I would like to focus briefly on three areas: first, physiotherapy diagnosis in balance disorders; secondly, the appropriate components of a vestibular rehabilitation programme and thirdly, the relevance of vestibular rehabilitation to people with neurological conditions.

1. Diagnosis

In her invaluable book *Vestibular Rehabilitation* Susan Herdman (Herdman 2000) makes an important distinction between the medical diagnosis and the physiotherapy diagnosis in balance disorders. The medical diagnosis focuses on the specific pathology. The physiotherapy diagnosis is concerned more with the vestibular system as a functioning unit, which is directly relevant to its rehabilitation needs. These diagnoses may not map specifically to the old ICIDH's terms of 'impairment' and 'disability', but they perhaps stand in the same relationship to each other as those terms. For example, a patient with unilateral vestibular hypo-function will require a programme of physiotherapy and vestibular rehabilitation with the aim of restoring function by encouraging CNS adaptation to new levels of signalling from vestibular receptors. That is a physiotherapy diagnosis. The vestibular hypofunction will result from one of several conditions, such as an attack of vestibular neuronitis, of Ramsay-Hunt syndrome, or even subsequent to an attack of Meniere's disease. These are medical diagnoses. (*Figure 1*)

On the other hand a patient with one medical diagnosis could present with one of several physiotherapy diagnoses, depending on the stage of the pathology and the patient's reorganisation of their systems in response to it. For example, a patient with Meniere's disease might present in several ways, ranging from a state in which rehabilitation would be inappropriate, to a condition requiring vestibular rehabilitation working through adaptation and habituation, or a state requiring advice and recommendations to adopt substitutive strategies. (*Figure 2*)

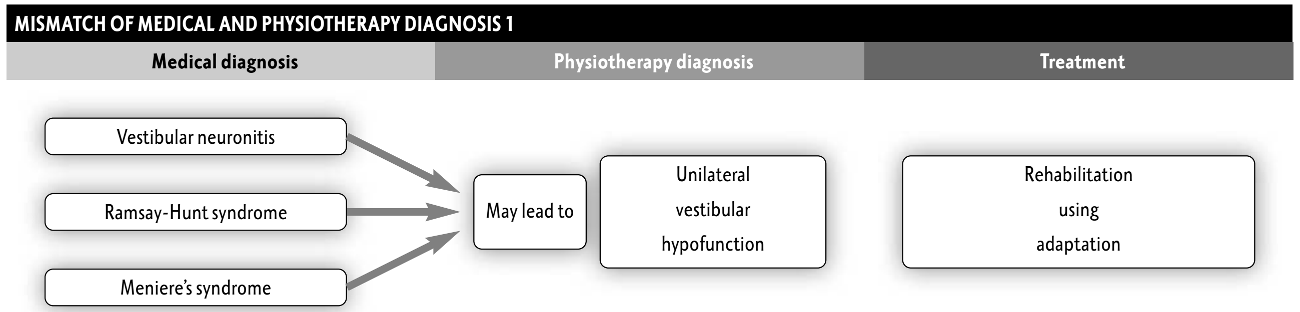

Figure 1

The ability to make such diagnoses requires good assessment skills and in some cases some good equipment, and it is usually (but not always) facilitated by a good referral diagnosis. But it rests mainly on good knowledge of vestibular anatomy, physiology and pathology, combined with a willingness to listen to the patient's description of their problems.

Commonly it is left to the physiotherapist to determine the physiotherapy diagnosis, after medical staff have referred a patient with a medical label in the hope that the patient will benefit from rehabilitation. In Greenaway's audit for example, there were patients with ocular melanoma, tinnitus, and hyperacusis, none of which are normally indications for physiotherapy. Sometimes it may be necessary for the physiotherapist to refer back to medical staff patients for whom vestibular rehabilitation is inappropriate. This tension between the medical and physiotherapy diagnosis is perhaps present through the whole spectrum of physiotherapy, and is an inevitable corollary of the physiotherapist's unique role in recovery and of the physiotherapist's status as an autonomous professional. (But it does make audit using referral diagnoses very difficult indeed.)

2. Components of vestibular rehabilitation

Greenaway's rehabilitation programme used the Cooksey-Cawthorne exercises. At the Leicester Balance Centre we incorporate elements of these exercises to encourage adaptation and habituation. The choice of movements used are determined less by the original rigid order, and more by the patient's specific problems, as revealed by subjective assessment and posturography.

In addition there will almost always be an element of retraining through exercises involving the vestibulo-ocular reflex (VOR). These were not a part of the Cooksey-Cawthorne programme (Cawthorne 1944 and Cooksey 1946), and were not mentioned by Greenaway, but are fully described by Herdman (Herdman 2000). Controlled feedback of error signals resulting from a faulty VOR appears to be a potent driver for rapid adaptation and recovery (Herdman 1998). It is a vital part of modern vestibular rehabilitation.

3. Vestibular rehabilitation in people with neurological conditions

Vestibular rehabilitation is most immediately effective in people with an intact CNS who have incurred some insult to the vestibular end organs in one inner ear. Recovery is slower and often less complete in people who have a damaged, fluctuating or progressively deteriorating CNS, such as in cases of cerebellar ataxia, or MS. Patients who have 'vestibular' symptoms following one-off damage to the CNS such as in CVA or TBI, may have better prospects for successful outcomes to a programme of vestibular rehabilitation.

I would like to highlight here the need for accurate differential diagnosis, and the possibility of a secondary vestibular condition overlying a primary neurological condition. I remember very well a lady with MS who presented at the Leicester Balance Centre. She had a long history of vague unsteadiness, a fine resting nystagmus, and she performed poorly on posturography. But in addition

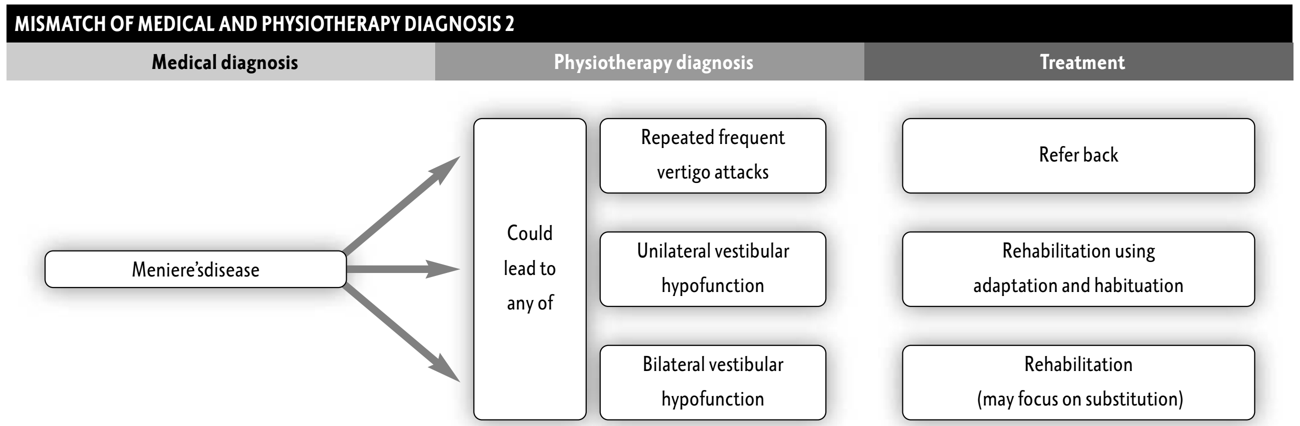

Figure 2

she spoke of a recent marked deterioration in symptoms, characterised by brief spells of intense vertigo, especially on turning over in bed – the classic symptoms of Benign Paroxysmal Positional Vertigo (BPPV). She was very happy indeed when these recent increased symptoms were removed by an Epley manoeuvre (Epley 1992) which presumably repositioned the offending otoconia from the posterior semi-circular canal. Subsequent vestibular rehabilitation made few inroads into her long-term symptoms, dashing her increasing expectations. However, she serves as a reminder that problems of the CNS and its peripheral receptors in the ear can coexist. This may be critical in the care of patients with TBI when we consider how little force is required to provoke an attack of BPPV.

The moral? Knowledge of vestibular anatomy, physiology and pathology are indispensable for all therapists working in neurological rehabilitation.

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Guidelines
for authors

Synapse **is the official newsletter of ACPIN. It aims to provide a channel of communication between ACPIN members, to provide a forum to inform, instruct and debate regarding all aspects of neurological physiotherapy. A number of types of articles have been identified which fulfil these aims. The types of article are:**

■ CASE REPORTS

Synapse is pleased to accept case reports from practitioners, that provide information which will encourage other practitioners to improve or make changes in their own practice or clinical reasoning of how to influence a change or plan a treatment for that condition. The maximum length is 2000 words including references. An outline is given as follows:

Introduction
State the purpose of the report and why the case is worth reading about to include in short sentences:

- The patient and the condition.
- How the case came to your attention.
- What is new or different about it.
- The main features worth reporting.

The patient
Give a concise description of the patient and condition that shows the key physiotherapeutic, biomedical and psychosocial features. The patient's perspective on the problem and priorities for treatment are important. Give the patient a name in the interests of humanity, but not the real name. Do not include any other identifying details or photographs without the patient's permission.

Intervention
Describe what you did, how the patient progressed, and the outcome. This section should cover:

- Aims of physiotherapy.
- Treatment, problems and progress.
- Outcomes, including any changes in impairment and disability.
- Justification of your choice of treatment; clinical reasoning
- The patient's level of satisfaction and the outcome and the impact on quality of life.

Method
This should clarify what intervention took place and what measurements were taken. It should include:

- Description(s) of outcome measures used and reference
- Interventions carried out (where, when, by whom if relevant)

Implications for practice
Discuss the knowledge gained, with reference to published research findings and/or evidence about clinical effectiveness. For example:

- Outcome for the patient.
- Drawbacks.
- Insights for treatment of similar patients.
- Potential for application to other conditions.

Summary
List the main lessons to be drawn from this example.

References
These should be in the Harvard style (see section on 'Measurements' below).

Further guidelines for writing case reports were published in the Spring 2001 issue of *Synapse*, page 19.

■ ABSTRACTS OF THESIS AND DISSERTATIONS

Abstracts from research projects, including those from undergraduate or postgraduate degrees, audits or presentations. They should be up to 500 words and where possible the conventional format: introduction, purpose, method, results, discussion, conclusion.

■ AUDIT REPORT

A report which contains examination of the method, results, analysis, conclusions and service developments of audit relating to neurology and physiotherapy, using any method or design. This could also include a Service Development Quality Assurance Report of changes in service delivery aimed at improving quality. These should be up to 2000 words including references.

■ REVIEW OF ARTICLES

A critical appraisal of primary source material on a specific topic related to neurology. Download the ACPIN information sheet Reviewing research articles for further guidance from the ACPIN website.

■ PRODUCT NEWS

A short appraisal of up to 500 words, used to bring new or redesigned equipment to the notice of the readers. ACPIN and *Synapse* take no responsibility for these assessments, it is not an endorsement of the equipment. If an official trial has been carried out this should be presented as a technical evaluation. This may include a description of a mechanical or technical device used in assessment, treatment, management or education to include specifications and summary evaluation.

■ REVIEW OF BOOKS, SOFTWARE AND VIDEOS

Short reviews of up to 500 words to include details of availability, price and source for purchasing.

■ LETTERS TO *SYNAPSE*

These can be about any issue pertinent to neurological physiotherapy or ACPIN. They may relate to material published in the previous issue(s) of *Synapse*.

PREPARATION OF EDITORIAL MATERIAL

Copy 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.

Hard copies should be as close to journal style as possible, on one side of A4 paper with at least a 25mm margin all around, consecutively numbered.

The first page should give:

- The title of the article
- The names of the author(s)
- A complete name and address for correspondence
- Professional and academic qualifications for all authors, and their current positions
- For research papers, a brief note about each author which indicates their contribution and a summary of any funds supporting the work

All articles

- The text should be well organised and written in simple, clear correct English. The positions of tables, charts or photographs should be appropriately titled and numbered consecutively in the text.
- All abbreviations must be explained.
- Any photographs or line drawings should be in sharp focus with good contrast for best reproduction.
- All charts should be in black and white only and captions should reflect this.
- References should be listed alphabetically, in the Harvard style with punctuation as follows: Bloggs A, Collins B (1998) The use of bandages in treating head injuries Physiotherapy 67,3 pp12-13.
- In the text, the reference should be quoted as the author(s) names followed by the date: Bloggs A (1994)
- Acknowledgements are listed at the end.

Measurements
As the International System of Units (SI) is not yet universal, both metric and imperial units are used in the United Kingdom in different circumstances. Depending on which units were used for the original calculations, data may be reported in imperial units followed by the SI equivalent in parentheses, or SI measurements followed by imperial measurements in parentheses. If the article mentions an outcome measure, appropriate information about it should be included, describing measurement properties and where it may be obtained.

Permissions and ethical certification
Protection of subjects: 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. The use of names for patients is encouraged in case studies for clarity and humanity, but they should not be their real names.

Submission of articles
The disk and two hard copies 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* co-ordinator:
Louise Dunthorne
24 Warren Heath Avenue
Ipswich
Suffolk
01473 704150

Note: all material submitted to the administrator is normally acknowledged within two weeks of receipt.

Regional representatives

EAST ANGLIA
Sesa Ishaya
t: 01473 702072
e: airavatasesa@yahoo.com

KENT
Lisa White
t: 01634 810998
e: lmwhite@talk21.com

LONDON
Sandy Chambers
Physiotherapy Department
St Thomas' Hospital
Lambeth Palace Road
London SE1 7EH
t: 020 7188 5088
e: Sandra.Chambers@
gstt.sthames.nhs.uk

MANCHESTER
Nina Smith
Physiotherapy Department
Stepping Hill Hospital
Poplar Grove
Stockport SK2 7JE
t: 0161 419 2104
e: nina.smith@stockport.nhs.uk

MERSEYSIDE
Jo Jones
Alexander Wing
Broadgreen Hospital
Thames Drive
Liverpool
t: 0151 282 6000 ext 6827
e: joanne.jones@rlbuht.nhs.uk

NORTHAMPTON
Sarah Littlewood
Royal Leamington Spa
Rehabilitation Hospital
Heathcote Lane
Warwick
t: 01926 317712
e: SarahLittlewood@hotmail.com

NORTHERN
Julia Williamson
t: 0191 273 8811 blp 1913
e: jules.claravale@virgin.net

NORTHERN IRELAND
Siobhan Macauley
Physiotherapy Department
Belfast City Hospital
Lisburn Road
Belfast
t: 0289 90263851 ext 2545
e: siobhanmacauley@bch.n-i.nhs.uk

NORTH TRENT
Alison Clark
Royal Hallamshire Hospital
Glossop Road
Sheffield
t: 0114 271 1900 ext 310
e: alison.clarke@sth.nhs.uk

OXFORD
Fiona Cuthbertson
t: 01865 224196
e: fcuthbertson24@hotmail.com

SCOTLAND
Paula Cowan
Physiotherapy Department
Department of Clinical
Neurosciences
Western General Hospital
Crewe Road South
Scotland EH4 2XU
e: sandpcowan@yahoo.co.uk

SOUTH TRENT
Lal Russell
Soth Corridor Rehab
Physiotherapy Department
Nottingham City Hospital
Hucknall Road
Nottingham
t: 0115 969 1169 ext 45378
e: lrussel1@ncht.trent.nhs.uk

SOUTH WEST
Kirsten Cheadle
Physiotherapy Department
The Royal United Hospital
Coombe Park
Bath BA1 3NG
t: 01225 821957
e: neuro.therapists@
ruh-bath.swest.nhs.uk

SURREY & BORDERS
Sally de la Fontaine
t: 01483 234219
e: sallydelafontaine@orchidserve.com

SUSSEX
Clare Hall
Physiotherapy Department
Conquest Hospital
The Ridge
St Leonards-on-Sea
East Sussex TN37 7RD
t: 01424 755255 ext 6435
e: cmhall@pop3.hiway.co.uk

WESSEX
Helen Foster
Physiotherapy Department
Royal Hampshire County Hospital
Romsey Road
Winchester
Hants
t: 01962 824917
e: jon.foster@veritas.com

WEST MIDLANDS
Liz Cohen
School of Health Sciences
University of Birmingham
Edgbaston B15 2TT
t: 0121 414 8379
e: e.l.cohen@bham.ac.uk

YORKSHIRE
Caroline Brown
Physiotherapy Department
Neurosciences Unit
York Hospital
Wigginton Road
York YO3 8HE
t: 01904 725747
e: cazzabelle@hotmail.com

Syn'apse

Administrator
Louise Dunthorne

Editorial Advisory Committee
Members of ACPIN executive and
national committees as required.

Design
kwgraphicdesign
t & f: 44 (0) 1395 263677
e: kw@kwgraphicdesign.co.uk

Printers
MF Barnwell & Sons, Norwich

Address for correspondence
Louise Dunthorne
Synapse Administrator
24 Warren Heath Avenue
Ipswich
Suffolk
e: louise@peterdunthorne.com
t: 44 (0)1473 712587