POSTURE & MOBILITY GROUP

ISSN 1752-1629

POSTURE & MOBILITY

www.pmguk.co.uk

Volume 24:2

Autumn 2007

Incorporating NTE 2007

POSTURE & MOBILITY GROUP

National Training Event (NTE) 2008

ARE OUR WHEELS FALLING OFF?

We would like to thank the following organisations for sponsoring this year's event:

days Healthcare

RMS Rehabilitation Manufacturing Services Limited

SUNRISE MEDICAL

INVACARE

Greencare

Blatchford Seating Products

JCM

For any organisations wishing to sponsor an activity for NTE 2008 either email patricia.marks@pmguk.co.uk or call 01823 338646

POSTURE & MOBILITY GROUP

2nd Announcement and Call for Papers

National Training Event (NTE) 2008

The University of Warwick

9th, 10th & 11th April 2008

Papers (for platform and/or poster presentation)

Contributions are invited from the PMG membership and all professionals working in the rehabilitation, posture and mobility fields.

Full details of the format required for abstracts and the submission form itself can be found on the PMG website www.pmguk.co.uk/abstract.php. Abstracts should be submitted online via the website; however if you do not have access to the internet please contact the conference organiser.

Closing date for abstract submissions: 14th December 2007

Please ensure that all abstracts adhere to the submission criteria. The abstracts for the 2008 event will be published in the conference compendium.

Bursaries

The Posture & Mobility Group will be offering a limited number of funded places at the NTE again this year. This is an opportunity for individuals working in the wheelchair and special seating service, or those who have a particular interest in this specialist field, to apply for a funded place. Bursary applicants must hold current membership of PMG.

Successful candidates will receive free attendance to the lectures (this includes lunch and conference refreshments), plus bed & breakfast accommodation and evening meals at the venue. Travel expenses will not be paid.

As a condition of receiving the award, a bursar agrees to write a report about one of the 2008 PMG National Training Event sessions they attend.

Closing date for bursary applications: 7th December 2007

NTE Administration, PO Box 776, Taunton, Somerset, TA1 9BR

Tel/Fax: +44 (0) 1823 338646

Email: patricia.marks@pmguk.co.uk

CONTENTS

Posture & Mobility is published by the Posture and Mobility Group, **Registered Charity Number 1098297**.
The views expressed are those of individuals and do not necessarily reflect those of the Group as a whole.
ISSN 1752-1629

Editorial

Welcome to the Autumn journal. I hope you have all had the chance to recharge your batteries over the summer and are feeling ready to face the challenges both at home and work in the winter months ahead. And, if you are lucky enough to not be entering a bleak winter where you're reading this, enjoy some sun for the rest of us! We as the publication team have worked hard to bring you another bumper edition of relevant reading matter, and are optimistic that there will be something for everyone to read in this issue.

We would, on the other hand, love to hear from you if you cannot find anything of interest to read, or if you would like to comment on any article published. We have standardised the style of the journal, adding abstracts at the top of articles along with the contact details of the authors so that you can easily get in touch with them.

I cannot stress enough that this is your journal, so please make use of it – read it, have discussions about it and most of all consider contributing to it. We will help you every step of the way, and never feel that people already know about the work you are doing, because they probably don't!

This edition has traditionally been an NTE/Conference edition, as it includes articles from the bursars. We have also included some additional articles from the keynote speakers. It is a great time to reflect on your own experiences and hopefully your own learning from the NTE. Jane Harding has written her whistle stop tour of the exhibition. What stood out to you at the exhibition?

We are trying to get news from around the regions and also from Wales, Scotland, Northern Ireland and Eire. Take a moment one coffee break (what are they?) to read the case study from Craig Egglestone and how his team in the North East of England have joint funded to benefit the client. Just because England seems to have stolen the show with their success in the Rugby World Cup, it doesn't mean that our Celtic friends cannot feature heavily in the world of Posture & Mobility.

It has been a busy year for PMG Education & Training sub-committee, and Geoff Harbach has reflected on his learning experience at the Jill Monger one day training in May. This course was a huge success and PMG is committed to providing other such high quality training opportunities to its membership, so spread the word; yet another reason to rejoin PMG if you know of any colleagues who have lapsed their membership during the recent online renewal process.

I would like to congratulate James Hollington on his fantastic work in producing the e-bulletin. This is what PMG has needed for a long time and we were just waiting for someone with James's drive and enthusiasm to take it forward. This will indeed complement the work of the Journal and improve communications for PMG as a whole

I would like to officially welcome Geoff Harbach to the Publication & Marketing sub-committee as a co-opted member. He has already shown huge commitment to his post and we are delighted to have him on our team. Geoff has taken the lead on re-designing our PMG promotional leaflet and has brought a wealth of clinical expertise from an engineering perspective to the editorial team. Read more about him later in the journal. The sub-committee still needs more members, so please come forward if you would like to get involved. No previous publishing experience required; it is your professional insight and enthusiasm that we need.

I hope you all enjoyed the new format News Bulletin in the Summer and thanks again to Jane and Olwen for producing this. As always Barend has worked tirelessly editing and writing articles while he flies around the world to countless exhibitions and conferences, and Helen continues to be a great clinical and editorial asset to our team. However, without Olwen there would not be a Journal. She is the front woman and the back bone of the journal and thank you seems somewhat inadequate. Happy reading!

Joanne McConnell, October 2007

Deadline for copy for the Spring 08 issue is 29th February 2008, and the focus will be Provision Models in Posture & Mobility. The aim of Posture & Mobility is to keep members in touch with current events in the world of posture and mobility and to provide the opportunity to share ideas and learn of new initiatives. Articles submitted can be between 500 and 2,000 words. We also welcome contributions for Signpost, plus reviews on books, reports and products. For details on format etc, please contact **Olwen Ellis** at **olwen.ellis@pmguk.co.uk** or **Telelephone: 0845 1301 764**.

Letter from the Chair

The summer seems to be well and truly over. September feels like Autumn; children go back to school; I will have to respond to those emails about the work Christmas "do" sent in early August which I refused to reply to at the time purely on point of principle that I will not think about the festive season before I've been on my summer holiday! Incidentally, half of my summer break was spent camping… during the week that it rained…

The PMG doesn't seem to take much of a break over the summer. I have been trying to finish off negotiations for a fixed rate contract for NTE (National Training Event) administrative services. Dave Calder has been busy with his team preparing a programme for NTE 08 and finalising budgets for the event. James Hollington seems to have the website by the throat. Jo McConnell has been busy preparing this journal. Jane Harding gave us the Summer Bulletin. Henry Lumley and Olwen got the membership subscriptions on-line for June (a deadline we managed to stick to). Barend ter Haar and I have started looking into how the group becomes more politically astute. Martin Moore and Monica Young arranged a one day conference in May and have overseen applications to the PMG Education & Training bursary. Linda Marks has been giving thought to the continued representation of medical colleagues within the group. David Porter and Nigel Shapcott have been busy overseeing the research grant applications and putting their minds to how the group might obtain larger sums of money to support larger scale projects. Kirsty-Ann Cutler, Craig Egglestone and Helen Hislop have been busy with their respective sub-committees.

There is much other activity beyond that described above but I hope this gives a flavour of what your committee has been doing.

Despite all this activity we have continued in our concern with the "Transforming Community Equipment and Wheelchair Services" project which started in 2006. As you will be aware, the project aims to develop a new model of service provision which will best meet the needs of the client while at the same time cutting costs by improving efficiency.

At the time of writing, a number of wheelchair services around the country are attempting to collect data according to a template developed by the Department of Health team with input from the participating wheelchair services.

The template is designed to collect sufficient data from which the Department can derive the relative proportions of complex to less complex clinical caseload (I hesitate to use the word "simple" when applied to our field).

It would seem that some services are having more success with collecting the data than others. I can only imagine that this is largely due to staff availability because of the large amount of data required.

This exercise should finish in November 2007. We shall then await the results and continue to work with the Department to further the aims of the PMG and to represent the membership to the best of our ability.

You will have received notification that abstract submissions are being accepted for the NTE 2008. Please consider putting forward your work either as a poster or free paper submission. The bursary application process is also open. Please see the website for further details of both and to keep up to date with the activities of the group.

Yours,

Dave Long, PMG Chair, October 2007

Contacting PMG:

PMG Administrator: Olwen Ellis
Email: olwen.ellis@pmguk.co.uk
Telephone: 0845 1301 764

National Training Event: Patricia Marks
Email: patricia.marks@pmguk.co.uk
Telephone: 01823 338646

National Training Event 2007

Superman's clones, one size one mind: us?

Design for All (DfA), a broader picture: the design thinking for social inclusion

Avril Accolla, Designer, dott.DI, Vice-President EIDD Design for All Europe,
Vice-President IIDD Design for All Italy

Abstract: *There may be one design that works for Superman, but not for the rest of us since we are each very different. In this article Dr Accolla argues the case against designing for an 'average' person, since hardly anyone is 'average', but that design should cover the needs of both ends of the spectrum, and all cases in between. Illustrations are provided where the needs of those with disabilities have been encompassed in designs that work for everyone.*

Why DfA at the PMG NTE?

Because all the actors interested in the posture and mobility field are essential in the process of having satisfied, independent users enjoying a Society for All, DfA can give new perspectives and possibilities to this field of expertise and action. Getting rid of certain specific barriers can be relatively easy when we have both the will and the means. Building a world that respects human diversity and caters for the needs and desires of a complex, globalized society is a challenge: DfA faces this challenge with a holistic approach and a process based on design thinking.

In striving for a Society for All, we need to achieve synergy in professional consulting and awareness in all aspects and levels of the process: that's why DfA is relevant at PMG NTE.

Superman dresses himself up as Clark Kent to mingle among us, real Clark Kents, disguise themselves as Superman to conform to the designed artificial environment.

We adapt to standards, expecting nothing more than standardized answers to standardized needs set by a *Deus ex Machina*, quite absentminded and with little clue of our real needs.

As P. Kercher writes "Standards have a sensible purpose: achieving matches between parts of machines, based on their similarities. Humans are not machines and should not be categorised."

DfA answers by respecting human diversities and using them as one of the richest tools to achieve social inclusion in the most effective, creative and satisfying way.

Our discomfort in managing daily life (handicap) is generated by social and design factors: it is not generated by our disabilities, incompetences, lack of knowledge etc. The things and environments we use were not devised for us, but for somebody else: somebody with a benchmark imagery technically dedicated to the specific situation of use, somebody who speaks a different language, somebody with a different system of cultural de-coding, somebody with different intentions and necessities of use, somebody who is younger or older, stronger and so on.

Why does this happen?

In today's design practice, human diversity is not perceived as a complex reality to cater for. When it is considered, human diversity is limited to mere anthropometric evaluations: how much does the size of the palm of your hand matter (which, by the way, it is not easy to find in manuals) in the use of a remote control which implies de-coding, comprehension and managing the interface in different use situations?

Ergonomics has long been proposing the systemized and structured involvement of the end user in the phases of concept, design and control. This is a fundamental and valid principle: but do the hypothetical users examined and involved represent us? For example, does the methodological system applied to evaluate the use of packaging for medicines anticipate greasy hands, the presence of smoke, a headache and residual panic?

A natural tendency

Design for All is design for human diversity, social inclusion and equality (EIDD Stockholm Declaration© 2004). This is what users are searching for: the tool that keeps life simple. When they find it, the object's commercial success is the first result. Looking at the state of the art we find products that take DfA into consideration and products that do not… the result of a lucky cycle. Here are some examples.

Biro, writing for everybody everywhere *(Fig. 1)*

The ballpoint pen superseded the fountain pen because it perfectly interprets the user's real needs: writing without

being calligraphists and free from a process of use which has the characteristics of a ritual. This object leaves the freedom to enjoy the artistic complexity of the fountain pen as a nice market. How many tools would we wish were like this in our daily life?

Fig. 1 – Biro – Inventor Làszlò Bìrò (Budapest 1899 - Buenos Aires 1985) patented the invention for the first time in Paris in 1938. Adopted by Britain's Royal Air Force because it worked better than fountain pens at high altitude.

The potato peeler, the tool that has replaced the knife *(Fig. 2)*

This object was born to enable people with special needs to peel vegetables and fruits. Nowadays it has become a best seller, present in every kitchen in all possible shapes, because it calls for less skill, experience and attention on the part of the user, puts less stress on the articulations, offers flexibility of use… and wastes less pulp. We are not all chefs or soldiers confined to barracks.

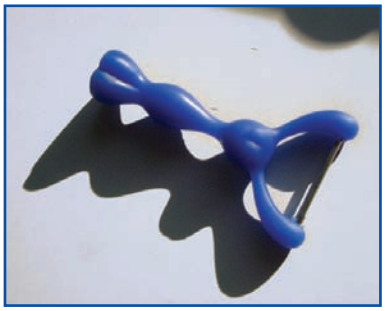


Fig. 2 – ***Potato Peeler*** *Produced by Koziol.*

A different solution for packaging.

This Pronova Biocare packaging presents quite a good DfA solution: it caters for our real needs. *(Fig. 3)*

When we get up, our muscular strength is not at full force. Wet or greasy hands diminish the efficiency of the force we apply. For an elderly person or one with dystrophy, muscular strength is in progressive diminution. For a child, this process works the other way around. If you have arthritis, using strength is painful. For a parent, two hands free at the same time are sheer luxury.

Fig. 3 – Pronova Biocare's plastic medicine bottle. 2004.

Using this packaging is comfortable, easy and intuitive *(Fig. 4)*. The wide cross-section of the cap and the bottle avoids the problem of fine grasp and power grasp. The grip is more efficient than the ones used in most plastic bottles. The cap's cross shape with differently wide arms strongly connotes the product's image and offers alternative opening actions at the same time: insert whatever you have at hand into it, even the side of a table, and use the leverage to open it effortlessly.

Fig. 4 – Detail of the cap

Mando, multipurpose remote control

Mando is a home automation remote control and is also an electronic key and a key-ring *(Fig. 5)*.

As the object must be programmable, it requires an easily opened shell. This can be done by turning the ring (also key-ring), a gesture that transforms the object into game and antistress therapy *(Fig. 6)*: the object develops the marginal and optional usefulness which makes it friendly.

The variability of the product's configuration is notable: with or without electronic key, 2 or 4 buttons used single or in couples, in combinations which are not predictable, but are chosen by the client.

This complexity suggested the use of multiple codes: tactile and chromatic contrast, mapping and shape. Cognitively, the design copes with the need to differentiate and to identify the buttons through iconic choices which allow different possibilities of decoding and associating; the electronic key is indicated by a appreciable subsidence.

Giugiaro Design and KHRAS architecture for DfA in practice: a seamless travelling system *(Fig. 7)*

The design of Copenhagen's driverless light underground co-ordinates the mobile material (the train) with the fixed structures (the stations). There are tactile orientations on the floor. The chromatic contrast between the train and the stations and inside the wagons has been studied, the lighting in the stations is a combination of artificial and natural and the carriages have wide panoramic windows (which

*Fig. 5 – **Mando:** Remote home automation control and electronic key. Produced by BTicino, 2006. Designed by Avril Accolla*

*Fig. 6 – **Mando:** Orthogonal view, showing movements and interface detail*

*Fig. 7 – **The Copenhagen Metro**, train and stations. Oerestad Development Corporation Ed., 1st phase 2002, 2nd 2003, 3rd 2004. Designed by Giugiaro Design and KHRAS architecture.*

*Fig. 8 – **TX1 London taxi** Produced by London Taxi International. Designed by Jevon Thorpe. Higher and wider, the new taxi accommodates electric wheelchairs (from the side and not from the rear!) and prams; it includes a child seat, a passenger/driver intercom, reading lights, a mirror and a plug for recharging cell phones. The door handles light up when the taxi is free, the internal handles and the edges of the seats are colour-contrasted for better perception.*

*Fig. 9 – **Abbracio** (hug) retentive safety baby seat. Prototype. Designed by Avril Accolla and Paolo Favaretto*

also avoids the sense of segregation). There are no barriers, the carriages have projecting seats that leave space for a guide dog, for luggage and for cleaning operations. The lifts are designed to be big enough to accommodate prams for twins, which are particularly frequent in Denmark. The design, coherently with DfA methodology, was tested by the citizens of Copenhagen, who guided the changes: first with user tests on the mock-up and then with test trips.

TX1, the new London taxi: the same as always, but now the most accessible in the world *(Fig. 8)*

In 1995 a law decreed that the UK's taxi services had to conform to accessibility by 2000 in London and 2012 in the rest of the country. London Taxi International invested 32 million euros in the 20,000 TX1 in London project. Jevon Thorpe wanted to combine the black taxi's timeless image with "user needs before touching the pencil": the users from the Transport Advisory Committee were involved during the entire design and development process.

"Abbraccio" (hug) retentive safety baby seat *(Fig. 9)*

This baby seat was created to serve the requirements of seriously disabled users: encephalopatic children, a user group with different auto efficiency levels and so diverse needs. The object provides features that range from a specialized support (e.g. retractor) to a complete retention system, head included. The seat must also follow the child's growth from 5 months to 5 years (a considerable range).

One crucial aspect was the need to provide this structured support in an extremely natural way (like a hug): the seat is like the parent's lap and the holding band functions like the parent's arms. Then comes the research into playfulness: shapes and colours have to stimulate the imaginative fantasy ("it looks like Sitting Bull..") and get rid of that frustrating hospital look that seats of this kind usually have, like so many other aids.

In this project, the DfA approach transformed an aid for disabled children into a safe seat system for all children at home, at school or in the car, according to need; it transformed a quite low circulation object, so with an insufficient budget for the Research & development it deserves, into an object with a very wide potential market, bringing clear economic advantages both to the producer and to the client.

EIDD website: www.design-for-all.org
IIDD website: www.iidd.it

"Removing the barriers for bariatrics – transport options"
Speakers: Trevor Graham and Anna Fletcher
Occupational Therapists for Motability

Report by Kirsty-Ann Cutler, Clinical Specialist OT, SBPCT, West Midlands Rehab Centre

Abstract: *Motability provide nearly 170,000 vehicles per year, 8,000 of which are through the Grant Scheme for more complex cases, 1,000 of which are for wheelchair accessible vehicles. The scheme is available to those receiving certain state benefits. Equipment is more likely to wear out and/or fail in service due to the additional loading and there are functionality, legal, safety and duty of care issues to consider when implementing these schemes. OT staff have recently been made redundant raising quality of provision of service issues for the future.*

Trevor and Anna set the scene with a presentation and then a discussion about 3 Bariatric cases. Incidentally Trevor and other OT's and connected staff have now been made redundant. Anna has been kept on as an office-based therapist.

Motability is the UK's leading vehicle scheme for disabled people. They provide vehicles, powered wheelchairs and scooters. The vehicle schemes are administered by Motability Operations, a not-for-profit private company owned by the major banks. Route2Mobility is a limited company which operates the wheelchair and scooter scheme.

The scheme is available to anyone in receipt of the Higher Rate Mobility Component (HRMC) of the Disability Living Allowance (DLA) or War Pensioners' Mobility Supplement (WPMS) providing they have at least 12 months of their award remaining. One third of vehicles are supplied for passengers (including children), 90% of customers have a standard production vehicle and 10% require special vehicles or adaptations.

There are two different sections of Motability:

General Scheme which provides over 160,000 vehicles each year. Customers deal direct with an accredited Dealership for Motability.

Grants Scheme which deals with 8,000 new/replacement vehicles per year and 1,000 of these are wheelchair accessible vehicles.

Concerns for Bariatric customers are:

- the increased wear and tear
- the risk of failure of equipment
- the legality of use of a vehicle because of the above

"It is an offence to use a vehicle in conditions that exceed either the gross vehicle and/or the plated axle weights" (Road Traffic Act 1988).

General Scheme Customers

The responsibility is on the driver of the vehicle to ensure that the vehicle is legal. It would be beneficial to have advice from the dealership about un-laden weight, gross vehicle weight and plated axle loads, but this may not be their prime concern!

Grant Scheme Customers

As a relationship is established between Motability and the customer a duty of care exists. This can restrict vehicle choice for grant customers. Motability procedure is based on customers of "Above Average Stature" and includes customers over 25 stone (159kg) and others who identify problems with space.

Customers of above average stature are asked to look at specific standard production vehicles and to consider the following: size of door aperture, space between seat and steering wheel/pedals, seat position, seat height, vehicle height. Problems can include undue wear on seat and sometimes a heavy duty seat can be provided.

Information about the customer's weight is vital including whether it is constant or fluctuating. Also information about the wheelchair/scooter's weight including all additions to the wheelchair such as heavy duty batteries, changes in backrests, armrests or footplates, pressure relieving equipment.

Three case studies were presented to illustrate the types of issues more apparent with Bariatric users.

In the past, in my experience, the OT's at Motability have been a valuable part of the team for the more complex users who need an appropriate wheelchair and vehicle combination and associated adaptations. As those OT's have now been made redundant, who will be providing the customer and our clients with the highly specialised knowledge of this client group?

For further information about Motability go to www.motability.co.uk

NTE 2007: Exhibition Review

Jane Harding, Occupational Therapist, Chailey Heritage Clinical Services
and member of PMG Publications & Marketing sub-committee

Abstract: *This is a very personal reflection on what were for me, some of the highlights of this year's exhibition at the NTE in Warwick. My apologies to those manufacturers whom I do not manage to acknowledge in this article, but my focus was on products relevant to my field of work at the time, and is by no means a reflection on their new products.*

Introduction

This year's exhibition was one of the largest seen at the National Training Event, with around 40 companies choosing this forum to exhibit their products and new developments.

Neo wheelbase

One of the first products that caught my eye was the new **Neo wheelbase** *(Fig 1)* from **South West Seating and Rehab**. This wheelbase has been carefully designed to be adjustable to meet the challenging and complex needs of special seating systems. It offers not only a substantial tilt of 35°, but also the superb adaptability of this base enables seat widths between 36 and 50cm to be accommodated using the same frame, but differing width central fittings. This will significantly increase the reusability and recycling of these bases, making it an exciting development for special seating services requiring a cost effective and flexible base.

Fig 1 – Neo Wheelbase

MoJo wheelbases

On a similar theme, **Specialised Orthotic Services (SOS)** were displaying the **MoJo** *(Fig 2)*, an aesthetic functional range of wheelbase systems designed to complement the use of special seating equipment. They offer the option of the unique "Quick-Lok" interface system with these bases, which enables seating equipment to be installed easily and removed from the wheelbase as required. The base is available in either a fixed or tilt in space frame: either can be easily converted to the other, again making this a flexible reusable seating option.

Fig 2 – Mojo wheelbase

Poziform

SOS also have a new range of harnessing system available called the **Poziform** range *(Fig 3)*. Using strong yet lightweight materials they are designed to provide optimal postural control and comfort. They also offer the ability to customise harnesses where standard sizes and shapes are not appropriate.

Fig 3 Poziform Cross Harness

Matrix Seating

Sticking with special seating news, design alterations to Matrix components by **Matrix Seating**, including the development of **flexible components** *(Fig 4)* and the use of mouldable carbon/glass fibre reinforcements, has led to the development of the orthotically inspired 'door' technique. Using integral flexible 4-ball units allows the Matrix to be hinged to apply the appropriate forces within the seat to correct spinal curvatures. This unique orthotic design was presented by Dr Steven Cousins as a free paper. These flexible parts also facilitate a dynamic component to be incorporated into the seating system with potential use to cope with extensor thrust forces and also for shock absorption. I look forward to hearing more about the outcomes of these trials.

Fig 4 – Flexible Matrix Component

Breezy Relax wheelchair

Finding cost effective alternative tilt in space wheelchairs has always been a problem. **Sunrise Medical** displayed their new contribution to the market with the cost-effective **Breezy Relax** wheelchair *(Fig 5)*. This chair is multi-adjustable to suit

Fig 5 – Breezy Relax Wheelchair

the user: it has both seat height and depth adjustments and is available in 3 seat widths (41, 46, 51cm) with seat width reducing pads available to accommodate those in-between sizes. It offers a wide range of accessories as well to customise the chair to the individual's needs. It appears to be a good alternative to other chairs already available on the market.

Optimo wheelchair

Similarly **Remploy Healthcare** had on show their new **Optimo** *(Fig 6)* tilt in space wheelchair again offering another alternative economical option.

Fig 6 – Optimo Wheelchair

Chunc paediatric seating

On the paediatric front, a company that caught my eye (not only because of their sponsorship of the event) was **Chunc**. They had on display additions to their paediatric ranges of seating. These additions included the Chunc **45° tilt wheelchair**

Fig 7 – Chunc 45° Tilt Wheelchair

Fig 8 – Chunc Adapt Wheelbase

(Fig 7), which as its name suggests has a whopping 45° tilt facility and is available with the full Chunc postural seating system.

Also now on the market from Chunc is the **Chunc Adapt** *(Fig 8)*, which is an adjustable tilt in space wheelbase that allows a wide range of seating options to be fitted to it.

X-Panda seat

Sticking with paediatric chairs, a unique product that I am really keen to trial in practice is the **R82 X-Panda** *(Fig 9)* seat that has been designed with an integral dynamic

Fig 9 – X-Panda Seat

backrest for use with children with extensor patterning. The back moves with the body allowing the child to extend and then return to the original and desired seating position avoiding the need for continual repositioning.

Academy Vector cushion

Another product that I have been interested in is the **Vicair Academy Vector** *(Fig 10)* cushion that **Gerald Simonds Healthcare** distributes. It uses the familiar Vicair Smartcell technology in a more contoured seat cushion. The seat has 6 adjustable sections which provide a significantly contoured cushion to promote lower limb alignment without compromising on pressure relief.

Fig 10 – Vicair Academy Vector Cushion

i2i head and neck positioning support

BES Rehab had a number of new products on their stands which were of interest, the first being the new range of **Stealth** accessories that they will be distributing in the UK. Of particular interest to me was the new **i2i head and neck positioning support system** *(Fig 11)*, which has been designed to provide substantial support for those with little or no head control. Head support is a major issue in the field of postural management and often proves impossible to resolve, despite considerable attention being given to the positioning of the rest of the body.

The **i2i** offers posterior support to prevent hyperextension, and lateral and anterior supports to prevent flexion and rotation of the neck. The anterior supports are available in differing lengths and with an optional chin support for further positioning control.

Fig 11 – i2i Head and Neck Support

Also unique 'flip-down' bracketry is available for easy removal and repositioning avoiding the need for complete removal and therefore improves the reliability of maintaining its original positioning!

Fig 12 – Stealth 'flip down' Headrest Bracketry

Meridian Wave cushion

Also BES was exhibiting an expanded range of the Varilite seat cushion and back range, which now includes the **Wave Series** of contoured bases for positioning support. These three differently contoured bases can be combined with the exciting **Evolution** cushion for improved positioning or they can also be used with the new dual-chambered **Meridian** *(Fig 13)* cushion.

Fig 13 – Varilite Meridian Wave Cushion

The unique dual chambers in this cushion design create an integral ischial ridge and wedge for effective positioning.

Reflex cushion

Another addition to the Varilite range is the self regulating **Reflex** cushion which requires no adjustment, for those users requiring a medium risk level, low maintenance cushion.

X3 X-Sensor pressure mapper

Sticking with the theme of pressure care, **Sumed** was exhibiting a number of new products, including the latest in their pressure mapping systems: the **X3 X-sensor** system *(Fig 14)*. With ultra thin sensor pads to optimise the contouring of the mat, it also features the option of a portable handheld display unit which allows the system to be easily moved around and transported (a real bonus in my eyes, having spent many occasions carting laptops, pads, and interface modules around).

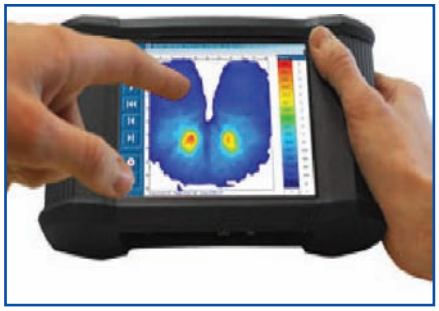


Fig 14 – X-sensor pressure mapping system

Viscotech Supreme Contour Gel cushion

Sumed was also presenting its new range of viscoelastic cushions, the Viscotech range. A cushion in this range particularly caught my eye and that was the **Viscotech Supreme Contour Gel cushion** *(Fig 15)*, a cushion that combines a contoured viscoelastic foam with a gel insert and can withstand user weights of up to 28 stone: an interesting alternative for the larger user.

Fig 15 – Viscotech Supreme Contour Gel Cushion

VR2 and R-net control systems

On a technology focus **PG Drives Technology** was demonstrating two new control systems. The **VR2** is a cost effective system that can be expanded by adding a range of modules, of real potential for use by wheelchair services. At the more advanced end of the range is the **R-net** system *(Fig 16)* which has been

Fig 16 – R Net Control System

designed to allow simple installation of multiple modules without the need for complex programming and continual upgrading. It features a high definition LCD display screen on the control module to enhance user control. Both offer some really interesting advancements in this field and as a therapist it is reassuring that the focus is to keep things simple!

Sleepform sleep system

An alternative aspect of postural management was focused on by **Leckey** with the presentation of their new **Sleepform** System *(Fig 17 & 18)* for children aged 0-18 years old. It is a simple, portable sleep system that is made up of the Sleepform mattress (a mouldable mattress that air is removed from to mould it to the child's unique contours), an Airflow overlay (a thin overlay that is placed over the SleepForm once the shape is finalized which provides comfort, and its material allows airflow between the child and the SleepForm shape), and then finally a range of trunk, pelvis, and lower limb positioning accessories to promote optimal alignment.

Fig 17 & 18 – Sleepform Sleep System

These include cushioned and elasticated chest, hip, leg, and knee guides which strap around the mattress and help to keep the child interfaced properly with the SleepForm shape, whilst still allowing some movement with the dynamic elastic elements within the straps.

In addition to all of the positioning components that are available, Leckey also offers a Fitted Grid Sheet. The grid markings can be useful to caregivers who are following specific recommendations as to how the system should be laid out. Leckey has a very informative DVD for this product.

Conclusion

All in all, the quality of the exhibition this year was fantastic, with some really exciting new developments on the market. It seems that manufacturers are actually listening to the demands of their users when designing their products. Once again my apologies to those exhibitors that I haven't featured. This is purely a personal reflection.

Bursar Report: Workshop for the Optimisation of Wheelchair Selection and User performance (WOWSUP!)

Speaker: Lone Rose, Clinical Specialist Physiotherapy (MCSP), National Spinal Injuries Centre, Stoke Mandeville Hospital

Reporting bursar: Stella Pronk, Occupational Therapist, East Dorset Wheelchair Service, St. Leonards Community Hospital, Nr. Ringwood

Lone Rose delivered an excellent presentation on the interesting subject of "workshop for the optimisation of wheelchair selection and user performance" in a too limited time of 8 minutes.

Ms Rose started the presentation with setting out the aims of this study, which was conducted in partnership with ASPIRE, Centre for Disabilities Sciences, Institute of Orthopaedics and Musculoskeletal Science, University College London, Royal National Orthopaedic Hospital and Brockley Hill, Stanmore and supported by the BIG Lottery Fund and ASPIRE.

The aims of the study:

- Investigate the relationship between propulsion biomechanics and upper extremity loading
- Identify simple and affordable measures to help therapists optimise posture, wheelchair set-up and performance whilst minimising long term overuse problems
- Identify usable information "nuggets" for interpreting wheelchair propulsion performance for both the therapist and wheelchair user.

The background to this study is that current research

into prevalence of upper limb injuries in long term wheelchair users shows that 30-60% suffer from shoulder pain, 4-35% elbow pain and up to 48% from hand pain. This pain is shown to be related to the duration of injury and activity, with age related problems forming an extra addition to these problems. Manual wheelchair users suffer significantly greater upper limb problems than the able bodied population.

Lal (1998) showed that 72% of spinal cord injury individuals had radiological evidence of degenerative shoulder changes 10 years after their injury, even if they did not yet feel symptoms.

The WOWSUP explored the relationships between propulsion biomechanics and upper limb extremity loading under real-life conditions, by using their developed protocol that re-creates the challenges of everyday wheelchair propulsion in laboratory conditions.

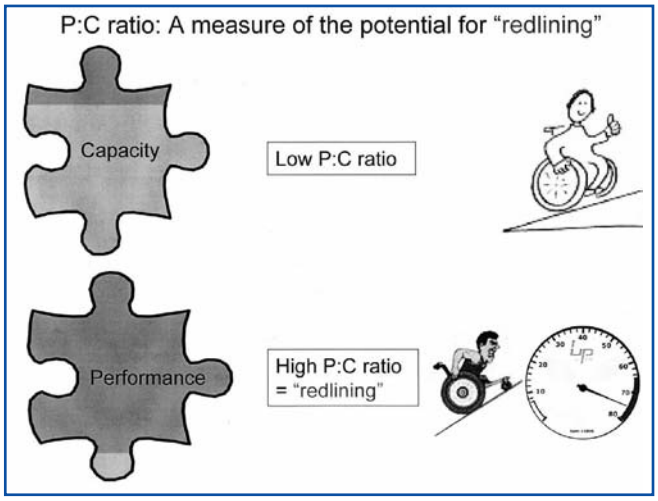
The ratio capacity (C=power exerted in a single push against maximum capacity) and the individual's performance (P=the power applied in continuous propulsion) was measured in 18 newly-injured and 10 experienced wheelchair users with spinal cord injury, on two functional mobility tasks: self propelling a distance of 10m on a flat lino surface and 6m on a 1:12 slope, in a lightweight wheelchair (Quickie GPV).

P:C ratio was calculated for the 1st push to get the wheelchair moving and the averaged steady state push.

This revealed the extent to which an individual is at risk of overexerting (redlining) in daily activities. The potential for this P:C ratio to be used as an outcome measure was explored.

The P:C ratio was clarified with the illustrations *(above right)*:

Data was collected using the SmartWheelTM, an instrumented push rim, which identified the stroke pattern, stroke frequency, stroke forces, push efficiency and push power in a wide variety of propulsion environments.



Data was analysed using the SmartWheel software, with a score of over 80% of capacity seen as redlining/overexertion.

Values of the P:C ratio for both new SCI and experienced SCI were below 80%. However, the experienced group was less likely to over-exert, thought to be due to superior propulsion technique and greater ability to appropriately assess and pace such tasks.

Lone Rose concluded her presentation – the results from this pilot indicate that P:C ratio has the potential to:

- become a useful outcome measure for clinicians and wheelchair users
- help identify the degree of redlining, to help in highlighting potential overuse activities
- guide towards strategies in reducing risks whilst still maintaining maximum functional independence
- be used in further research

The SmartWheelTM is concluded to be a useful research tool, however further work is required to improve its affordability, its ease of use and the interpretation in clinical practice.

Further analysis with regards to level of injury, positioning of the wheels and clients' age with regards to P:C ratio is still in process.

Contact details for Stella Pronk:
Email: stella.pronk@dorset-pct.nhs.uk
Tel: 01202 892874

Bursar Report: Wheelchair Navigation and the Neglect Syndrome Following Stroke

Speaker: Dr David Punt, Reader in Neurorehabilitaion, Leeds Metropolitan University

Reporting bursar: Cary Bernard, Senior Physiotherapist, Huddersfield & Dewsbury Wheelchair Service, St Lukes Hospital, Crosland Moor, Huddersfield HD4 5RQ

Introduction

Dr Punt started by describing the characteristics of neglect syndrome following stroke and described the 'double whammy' of disability these clients suffer. One in five clients with neglect syndrome is unlikely to return to walking. They are also less likely to be able to navigate safely around their environment in a powered wheelchair, so this form of mobility is also closed to them. In this study Dr Punt hoped to be able to characterise the performance of clients with neglect syndrome using powered wheelchairs and assess the value of different interventions such as spatial cueing.

Report

To collect objective data about a client's performance a Wheelchair Assessment Course (WAC) and a Doorway Accuracy Test (DAT) were devised as standard assessment tools. Dr Punt showed the conference a video of the WAC in action and very bravely left a faux pas in for all to see. Many in the audience waited for the inevitable as the client negotiated his way down the WAC towards two fire extinguishers on the wall. As the filming abruptly stopped one assumes that the quick rush by staff to catch the falling extinguishers averted any injuries. This amusing interlude also highlighted the importance of obstacles on walls as well as on the floor. Whilst experienced staff may have been congratulating themselves on spotting this obstacle, it would be a useful reminder for less experienced staff. This is a very real danger to clients and whilst few will have fire extinguishers in their homes my colleague recollected a complex of flats in which shelves for milk were thoughtfully fixed outside each resident's flat, just at head height.

This trial was relatively limited with only 7 participants. Results were possibly as to be expected, with errors on the WAC being greater on the 'affected' side. Performance on the DAT was affected by the door width, with clients able to steer more centrally through a wider gap than a narrow gap, where deviation towards the affected side was greater. Evidence such as this supports the case for home adaptation, even where perhaps the powered chair will physically fit through the available space. It also shows that it is important during assessments to try and match the width of the doors clients are assessed through to the width of the doors in the client's home environment. I have tended to assume that a wider door will simply give greater margin for error without necessarily considering how it might affect a client's performance if they have neglect syndrome. Another useful tip, which may help some clients with neglect, is to try the joystick on the opposite side. Although this may cause some problems with posture, Dr Punt's studies showed that this may help a client's performance in a powered wheelchair. I always feel if there is one point in a talk that will change one's practice, attendance has been worthwhile and for me this was that point. Next time I have a client with severe neglect who appears unable to safely use a powered wheelchair, I will remember this session and will try using the joystick on the opposite side.

As with much research this remains 'work in progress'. Identification of a problem is little use without a possible solution and Dr Punt feels that the most likely solution for clients severely affected by neglect is the development of a 'smart' or intelligent' wheelchair. This work is already in progress in association with other colleagues. The project to date has been supported by the Posture and Mobility Group and submissions will be made for a further award to support continuation of this work.

I would like to thank the Posture and Mobility group for awarding me the bursary which enabled me to attend not just this session but the whole of the National Training Event 2007. Events such as this do alter one's practice by presentation of new ideas and consolidation of existing ones and it remains an important date in the Posture and Mobility calendar.

Contact details for Cary Bernard:
Email: Cary.Bernard@cht.nhs.uk
Tel: 01484 343201

Dr David Punt's full report on this PMG-funded project is available to read on the PMG website: www.pmguk.co.uk/Research/2005+Projects/Dr+David+Punt

Bursar Report: Corrective Spinal Support within Custom Seating – Opening the Door?

Speaker: Dr Steven Cousins, Head of Biomedical Engineering Services, Royal Hospital for Neuro-disability

Reporting bursar: Dr Ben Cox, Clinical Scientist, SMART Centre, Astley Ainslie Hospital, 133 Grant Loan, Edinburgh, EH9 2HL

Introduction

As an NHS Clinical Scientist working in the field of wheelchair seating I was naturally drawn to this presentation from Dr. Steven Cousins, who has been instrumental in developing the Matrix seating system since its inception in the late 1970s. The Matrix concept was originally aimed at creating a universal orthotic/prosthetic body support system that could offer an alternative solution to the long-term fracture bracing of broken femora. Prototype segmented structures consisting of interlocking plastic components were developed, which later evolved into the Matrix and Lynx commercial systems that are widely used today. In a clinical follow-up study (Trail and Galasko 1990) it was concluded that, although the Matrix system offered advantages over alternative products, it was not always found to prevent deterioration in spinal deformity nor to prevent hip dislocation.

Report

Dr. Cousins began the presentation by providing historical context and describing collaborative links developed over the past twenty years with Swedish Orthopaedic Engineers. Through the collective experience of fitting many Matrix systems, a 2nd generation Matrix technique was conceived in the late 1990s (Cousins and Clarke 2006) that could overcome some of the limitations of the original Matrix and Lynx systems by combining the advantages of high strength rigid components with the shaping ability of flexible ones. Further development of the system was driven by the experience of the Swedish in the pioneering use of thermoplastic carbon fibre, now used to reinforce Matrix seats in advanced fitting techniques where thinness, stiffness and strength are required.

With the availability of flexible components and reinforced thin sections of Matrix, new clinical applications were identified by Dr. Cousins and others including corrective spinal support. Known as the 'door' technique, this new approach uses integral flexible components within the seat to create complex multi-axis hinging zones that can apply three-point loading, i.e. corrective forces, to the spine. Unlike a spinal jacket, the Matrix system allows corrective forces to be applied over the hip and along the thighs. Fabrication of the custom Matrix seat requires careful examination of the relationship between the Cobb angle and 'door' hinge zone angle with respect to the relative position of the support centreline to ensure that the direction of loading does not act to worsen any pre-existing deformity.

A preliminary study of 32 patients using the 'door' technique for corrective spinal support was described by Dr. Cousins. 29 patients were fitted in Sweden and 3 in England, with 24 full Matrix seats and 8 Matrix backs being issued. Patients were diagnosed with cerebral palsy, muscular dystrophy, spinal muscle atrophy and brain injury. Outcome measures used in the study included the use of a pulse oximeter, a 1296 sensor pressure mapping system, and also subjective observation. Dr. Cousins presented sample cases from the study and subjective observation showed dramatic improvements in the supported sitting posture of several patients. Overall, 30 of 32 patients were found to benefit from seat pressure reduction and vertebral column elongation. Of the remaining 2 patients, 1 patient (brain injury) made a marked recovery and 1 patient (cerebral palsy) failed compliance due to low cognitive ability.

The new Matrix spinal support technique has been shown to be successful in preliminary cases and clearly offers advantages over previous Matrix and Lynx seating systems. Given that the approach is relatively complex and bespoke, a need for appropriate training is indicated. In addition, the importance of objective outcome measures should be highlighted as should the requirement for specialist biomechanical knowledge within the skill set of wheelchair seating clinicians.

Acknowledgements

Dr. S. Cousins for the provision of additional information relating to this article.

References

COUSINS, S. and R. CLARKE. 2006. Improvements to Matrix seating: Technical and clinical developments. Technology and Disability, 18, pp.9-13.

TRAIL, I.A. and C.S.B. GALASKO. 1990. The Matrix seating system. Journal of Bone and Joint Surgery, 72-B(4), pp.666-69.

Contact details for Dr Ben Cox:
Email: ben.cox@lpct.scot.nhs.uk, Tel: 0131 537 9441

Bursar Report: Risk and Restraint

Speaker: Paul Dyer, Joint head of Rehabilitation Engineering, Kings College Hospital

Reporting Bursar: Liesl Funnell, Occupational Therapist, North Bristol Trust, Wheelchair Centre, Southmead Hospital

Introduction

The aim of this workshop was to discuss the complex issues around restraint and risk management in relation to posture and mobility management techniques. The discussion was a way of recording the individual issues and assisting the prescriber in arriving at an outcome which is acceptable.

Report

We all accept that risk is a part of life. In the field of posture management we may be required to consider the use of systems that may constitute restraint. Professionals consider prescribing these systems to enable a service user to undertake an activity safely. Clinicians may be reluctant to implement these systems due to possible risks highlighted. One of the ways of facilitating a consistent approach to risk and restraint is to apply Risk Management Techniques discussed in the session.

Firstly, it is important to define and understand the most important definitions:

Risk – The probability of harm

Restraint – The prevention/moderation of a force. The prevention of doing.

Hazard – Something with the potential to cause harm e.g. the materials and equipment we may use to restrict movement.

As prescribers of wheelchair equipment, we have a personal and legal responsibility to manage/control risk. Risk can only be acceptable if the benefits outweigh the perceived risks. To do this we need to clarify the three main aspects involved:

1. Hazards – what can go wrong?

Materials and equipment issued by a clinician may be used unnecessarily when other less intrusive methods could achieve the desired outcome. Using e.g. a harness may become routine rather than used in exceptional and agreed circumstances. This may be due to poor staff hand-over or training, lack of staff or staff absence. In many instances, the service user may have different groups of carers at school, home, day centre and respite. This makes it more challenging to implement agreed use of equipment issued.

The use of equipment issued could cause injury, pain or distress and could increase the risk of abuse.

2. Risks – what would be the effect if it did go wrong and how can I reduce the likelihood of it happening?

Levels of Risk are viewed in terms of **Hazard Severity** and its **Probability**. The severity can range from insignificant to catastrophic and the probability from rare to almost certain. Risk can be calculated using this risk management formula and it will assist you in managing the issue objectively.

Once risk has been identified you need to consider options that may reduce risk. e.g. using the equipment for a certain activity only, or for an agreed length of time and only when supervised. Consider setting up a set review date. And remember, only proceed if the benefit outweighs the risk!

3. Benefits – what can the client/carer gain from this?

This is also assessed according to a set score and is calculated to obtain the **functional** and/or **medical benefit**.

A last aspect to consider is checking that all application of equipment, materials and modifications is in line with the manufacturer's guidelines and their policy on using equipment alongside a different manufacturer's. The Risk Management process used in the workshop is only one of many which can be applied to help decision making. However, the general principles for understanding and identifying the three main aspects in risk management are the same. We were asked to use an example to implement the Risk Management process and saw clearly how differently people view and quantify risk and restraint.

For me the session highlighted the need for teams to have consensus on a Risk Management process. Decisions do not need to be made in isolation and you should get the support of your supervisor/manager and other professionals involved.

References:

NHS Controls Assurance Standards for Medical Equipment and Devices;
Medical devices – Application of risk management to medical devices,
Managing Medical Devices – MHRA.

Contact details for Liesl Funnell:
Email: Liesl.Funnell@nbt.nhs.uk

Bursar Report: Cross Agency Working

Speakers: Barbara Boland, Occupational Therapist, Manager Salford Wheelchair Services;
Jill Blanchard, Senior Services Manager, Independent Living;
Jenny Smart, (Services Manager, Equipment Loan Service).

Reporting bursar: Lynn Graham, Occupational Therapy Student,
School of Health Professions and Rehabilitation Sciences, University of Southampton

Introduction

A very informative and inspiring presentation was given by Barbara Boland on how cross agency working in Salford improved services, and by Jill Blanchard and Jenny Smart on how collaboration between The British Red Cross and the Isle of Wight Wheelchair Service has improved services for clients.

The call for services to become more timely, efficient, flexible, integrated and be provided closer to clients' homes, can be heard in current reports such as 'Out & About' and 'Our Health Our Care Our Say' A number of developments were made in Salford and the Isle of Wight, which impacted positively upon the services and helped them to meet these aims.

Report

Cross agency working

Partnership between the Wheelchair Service, Community Occupational Therapy teams, Special Needs Housing Team and the Equipment Service in Salford has allowed them to provide a better co-ordinated service to clients. Examples of how this collaboration leads to better services for clients were explained. Collaboration between the Wheelchair Service and Special Needs Housing Team means when a client is assessed for a wheelchair their home environment can be assessed and considered for necessary adaptations at the same time. Collaboration between the Equipment Service, Community Occupational Therapy service and Wheelchair Service means all equipment the client needs can be delivered and fitted on one occasion, joint funding can be utilised and the services are in a stronger position for procurement of equipment.

Another example included training for other members of the multidisciplinary team. By training other health professionals to become trusted assessors for simple needs, more assessments can be carried out identifying clients' needs quickly. Training for school staff working with wheelchair users has empowered them to be able to take on the role of providing continued power chair training for pupils, as needed. Once the initial handover and safety assessment has been completed, school staff can continue the process. This may enable more regular sessions to be completed with the children and allow wheelchair service staff to see more clients.

Collaboration with the voluntary sector

The British Red Cross and the Wheelchair Service on the Isle of Wight work closely to provide a coordinated service for clients. Jill and Jenny explained how clients who have a Red Cross Wheelchair are contacted at the end of the 3 month loan period to establish whether their need is long term. If this is the case the British Red Cross will send their details to the wheelchair service so they can be assessed for a wheelchair of their own. The client's GP is contacted by wheelchair services to obtain medical support for their need for a wheelchair for long term use. The British Red Cross will not remove the loaned wheelchair until the client has been issued with a permanent wheelchair of their own. Upon delivery of their permanent wheelchair the contractor or therapist will collect the British Red Cross wheelchair and return it. This cross agency working between the British Red Cross, Wheelchair Services and contractors prevents the client being left without a wheelchair and ensures a co-ordinated service is provided, meeting the needs of each client as quickly and efficiently as possible. Again this collaborative working seems to provide a simple cost effective solution to providing a more coordinated client centred service.

Self referral and flexible appointment system

Barbara explained how introducing a self referral system in Salford has helped the service become easily accessible for clients, health professionals and carers alike, ensuring needs are identified quickly. Once referred, clients are sent a letter asking them to call the wheelchair service to make an appointment for an initial assessment. This gives clients a choice in what day and time they wish to attend and Barbara reported it reduced the incidence of clients not attending their appointments by 40%. This reduction in wasted appointments is likely to mean more clients could be seen, impacting positively on waiting times.

User Group

A user group was set up in Salford, and was involved in determining how aspects of the service should be developed. users' experiences of different repair contractors were considered when deciding which repair contractor should be used. Users are involved in recruitment of new staff, in reviewing the service performance and in designing the service information leaflet. Involving clients who use the service seems vital if client centred services are to be provided and clients are to be empowered to work in partnership with services.

Conclusion

These simple solutions seem obvious, but do we all work collaboratively whenever possible? The collaborations in Salford and the Isle of Wight seem to reduce the amount of appointments a client needs to attend, ensures a holistic assessment is begun as early as possible, reduces waiting times, ensures clients are signposted to other agencies as necessary, ensures all agencies involved communicate and are aware of all the goals a client wishes to meet. It also seems to have benefits to the service such as stronger procurement of equipment, ability to use joint funding and fewer appointments being wasted due to clients not attending. This way of working seems vital if coordinated services are to be provided and the aims set out in current guidelines are to be met

Barbara finished the presentation by suggesting future plans for further improving the service in Salford. These included developing a web catalogue for all stock, moving to an in-house repair service, and expanding the amount of professionals trained as trusted assessors, to include Social Workers, District Nurses and others who have regular contact with clients. By continuing to communicate effectively and learn from successful developments within these services, can all wheelchair services further increase their cross agency working to provide a more coordinated service? Perhaps this could be a cost effective way forward, enabling service development in a time when finances and resources are in short supply.

Contact details for Lynn Graham:
Email: ldg204@soton.ac.uk

NTE 07 Prize-winners

There were 3 prizes on offer again at the NTE in Warwick in April:

- Best Free Paper – £100
- Best poster – £100
- Prize for delegate badge drawn from all those present at final session – Trip to International Seating Symposium in North America

Best free paper award

John Tiernan *(below left)* of Enable Ireland for "Developing an integrated wheelchair headrest for protection". As John had to cancel at the last minute, the paper was presented by his colleague Brian Madden *(below right)*.

Best poster award

Nicola Aburto and the Contour 886 team for "The use of Custom Moulded Seating for an Active Wheelchair User".

(from left to right) Mark Bryant, Nicky Aburto, Phil Swann, Chris Daniel, Andy Byrne with their winning poster.

Winner of trip to International Seating Symposium 2008 in Vancouver – Les Harper

Les is currently employed with Northern Lincolnshire and Goole Hospitals NHS Foundation Trust in Grimsby as a Rehabilitation Engineer. As well as his clinical duties, Les manages a small team of in-house technicians who provide the Wheelchair Service repair and reconditioning service. Les is married to Anne who just happens to be the Wheelchair Occupational Therapist! Anne will be going to Vancouver with Les in March. We hope they both enjoy the trip enormously and look forward to reading Les's report about the Symposium in the Spring 08 issue of the PMG journal.

Minutes of PMG Annual General Meeting 2007

Warwick University, 20th April 2007

Chair: David Long
Vice-chair: Martin Moore
Treasurer: Henry Lumley
Minutes: Olwen Ellis (PMG administrator)

1. Apologies were received from Libby Bradshaw.

2. Minutes of the AGM 2006

Linda Marks proposed that the minutes of last year's AGM be accepted. Anthony Welling seconded and the minutes were approved by those present.

3. Matters arising not covered elsewhere

None.

Settling down for the first Plenary session from Rosalind Ham. (photo: Peter Lane)

4. Chair's Report

The chair's report had been provided for all those present, and the chair gave a brief resume:

(a) Administration: 3 part-time, fixed rate contracts are being written to handle the administrative workload of the group – General Administration (Olwen Ellis); National Training Event (Patricia Marks/Perception Matters); Bookkeeping (Liz Lumley).

(b) Website – membership admin on course to go online in June 07. Generally moving to becoming a key resource for the group.

(c) NTE – thanks to commercial partners, to Dave Calder, Patricia Marks and the NTE sub-committee for the success of this year's NTE. NTE 2008 will be back here in Warwick.

(d) International Conference 2010 – Barend ter Haar has agreed to lead the steering group for this event, following on from the success of the 2005 Exeter conference. BSRM & SPMN to be partners again.

(e) Research – congratulations to David Porter and the R&D sub-committee for the success of this important area of PMG's work.

(f) SPMN – agreement with Catherine Mathieson, chair of Scottish Posture and Mobility Network, that the links between the two groups need to be strengthened.

(g) DoH Wheelchair Service & Community Equipment project – outcome of this still unknown. PMG involved in the consultation processes and David Long will keep the membership informed as much as possible.

(h) Communications sub-committee – Joanne McConnell is now editor of the twice yearly publication and will be assisted in future by Olwen Ellis. Request for members to contribute articles. There will also be a twice yearly news sheet in between the 2 main publications.

(i) Education & Training – one day courses arranged for May 07 in Birmingham; bursaries gradually being taken up for training courses.

(j) BSI Standards – please contact Geoff Iles via Olwen if interested in being involved in reviewing standards.

Pete Prentice demonstrating the TracAbout IRV 2000 from Cotswold Mobility. (photo: Dave Long)

(k) Financial planning – further discussion to follow in this meeting on how PMG should use surplus funds.

(l) Committee – the chair thanked all the retiring committee members for their significant contributions during their time on PMG committee: Sue Pimentel, David Porter, Lone Rose and Emma Stacey have come to the end of their 3 year term on the committee, with Kirsty-Ann Cutler completing her one year as a co-opted member.

Barend ter Haar proposed that the Chair's report be accepted by the meeting; seconded by Robin Luff. Chair's report approved by those present.

Webcasting

The chair reported on the new development that had taken place at this NTE, with Nigel Shapcott setting up a webcasting experiment with centres in Cardiff, Swansea and Hong Kong to be able to participate in some parts of the first day. This was funded from revenue set aside from the profits of the 2005 International Conference with a view to using the facility in 2010. There will be a report back, but it seems to have been a success. The plan is to archive the recorded presentations on PMG's website. Thanks to Streaming Wizard for their services.

5. Treasurer & Membership Secretary's report

(a) 2005 & 2006 accounts provided for those present. They will be published in PMG Spring publication.

(b) Henry Lumley explained that there had been an unexpected profit of £56,085 from the Blackpool NTE, which will be a useful cushion if there is a downturn in membership subs when the renewal system goes online in June. Only 450 of the membership have validated their details online, and it is difficult to gauge how many of the current members will renew.

(c) The professional administration of the group will continue to be an essential cost, as committee members cannot be expected to undertake the administrative work generated by new and developing PMG projects.

(d) After explaining the figures on surplus funds, the chair asked the meeting to approve the accounts presented. Andrew Frank proposed that the meeting adopt the accounts and Monica Young seconded the proposal. The accounts were approved and adopted as correct.

6. Elections to committee

(a) Martin Moore reported that there were 6 people nominated for the 5 vacancies on committee. The members elected to the 2007/8 committee are: Kirsty-Anne Cutler, Jane Harding, Helen Hislop, James Hollington and David Porter.

(b) No objections were raised to these members joining the committee, and the meeting approved the election result.

(c) The chair reported that there had been a very low return of ballots this year, and asked that members please ensure they vote in any future elections.

7. Any other competent business

(a) Henry Lumley explained the process for the new online membership renewal, and asked members to please contact Olwen Ellis if they have not received information about validating their contact details. Also made a plea for all standing orders to PMG to be cancelled immediately. If the standing orders are still in place in 2008, the group will consider such payments as donations.

PMG committee member Linda Marks on duty. (photo: Dave Long)

(b) Special Debate on use of the surplus funds

The chair reported that there is £55,000 of surplus in the bank that could safely be allocated to a major project or several projects, over and above the £32,000 reserved for the R&D sub-committee's small research project. There was a majority view expressed that the money would best be spent on a major research project and on increasing the political profile of PMG.

The editor, Joanne McConnell at the exhibition with Whizz-Kidz colleague Julia Cunningham. (photo: Dave Long)

(i) Research

Several ideas came from the floor for a meaningful research project and how to move it forward:

- Commissioning of qualitative research to establish service users' priorities for future research;
- Hold a consensus meeting to discuss with stakeholders;
- Economic study of cost per head & variation of this cost across the country;
- Benchmarking;
- Establish the number of people and level of need;
- Development of objective outcome measures;
- Offer bursaries to cover PhD fees to invest in future researchers;
- Inclusive design;
- Create a system to encourage and ensure research evidence is implemented.
- Develop a research theme over several years.

Suggestion also that joint funding between PMG and other agencies, including possibly the government, would give the research more gravitas and status.

The chair requested that David Porter take these ideas back to the R&D sub-committee in the first instance and to feed back to the main committee.

(ii) Political Activity

- After a broad discussion on whether or not PMG should become a more political body, Barend ter Haar gave background to the employing of a Westminster MP to ask relevant questions in the House of Commons. BHTA pays £3,000pa to Mark Oaten MP to ask questions, but there is added value as he also provides them with useful inside information.
- Barend ter Haar suggested that the group could approach Mark Oaten to see if he would consider taking on a similar role for PMG, and, given the common interests shared with BHTA, possibly offer the service at a reduced rate.
- Majority vote carried, no abstentions, one against.
- Henry Lumley reported on his meeting at the office of Parliamentary Under-Secretary for Health Ivan Lewis's office the previous day; Catherine Mathieson chair of SPMN reiterated that this high level political contact is essential to have any influence on government.
- The chair asked that if anyone had any ideas or concerns around this particular area, to please contact him.

9. Date of next meeting

Next year's PMG AGM will take place at this same venue on 11th April 2008.

Warwick University at Night. (photo: Clinton Davin)

Reports from Other Events and Courses

Integrated Health and Social Care: Delivering Joined–up Solutions

Barbican Centre, London EC2, 19th April 2007

Report on the proceedings of the conference by Linda Marks (on behalf of the PMG Executive Committee)

At a time when wheelchair services are being reviewed and linked more with community and social care initiatives, it seems appropriate to see if other integration programmes can offer useful insights or ideas. With that in mind, this particular conference caught my eye, and although no one from PMG could attend, we obtained the conference papers and I review them here for the benefit of the PMG membership.

Of the nine presentations on the day, only five were included in the pack, and three of these were papers for workshops. Nevertheless they made for interesting reading, and I have tried to draw out some themes at the end.

Firstly there seems to be a general recognition that there is a link between health, social deprivation and poverty – often covered by the term 'complex needs'. There have been a number of government papers over the last two years, looking at bridging the gap between health and social care by commissioning joint services with social inclusive strategies. Two keynote addresses (not included) would have reviewed these recommendations and documented progress. A panel, including the two earlier speakers, then discussed Integrated Care, Best Practice Commissioning, Community led solutions and the Impact of Individual budgets.

One of the papers included from Session 2, 'How to deliver Connected Care' was a report on 'The Connected Care Pilot Project' based at Owton near Hartlepool. Owton is a 1950's Council estate with 13% unemployment and 49% of households having limiting long- term illness; historically an area with "low level of individual involvement but good community spirit". First the project involved local people in identifying the problems that needed to be addressed, and how they might be resolved. The concept was to provide accessible integrated services on the estate, delivered by a diverse workforce drawn from health, community and social services, willing to work in a different way. The following was given as an example:

Mary, a part-time cleaner, lives with her partner and their two children. Her partner is schizophrenic, unemployed and has a history of alcoholism and violence. The family have debt and rent arrears. Mary is not prepared to put up with his abusive behaviour any longer, but doesn't want the relationship to break up.

Instead of the current reactive cycle of police involvement, child protection orders and crisis management, the project would deliver support around Mary's priorities of keeping her house and children and paying off her debts, whist a complex support team would work on her partner's mental health and alcohol issues.

The project commenced in 2004 and is being externally reviewed by the University of Durham. Emerging findings include that the initial information- gathering is developing the specification for the service, the model for engagement needs to reflect the range of interests within the community and a host organisation helped to promote local ownership. They also comment that extra support is needed for reaching groups with complex needs, and hence team capacity and training needs are crucial. There was no clear indication of how the project will be monitored from now on, and whether there is any evidence of cost benefits.

Session 3 was entitled 'The Workforce and the Patient', and the paper called 'Reconfiguring Services' was included. This paper discussed the setting up of the 'Coventry & Warwickshire Partnership Trust' in October 2006. This initiative was driven by changes in Primary Care and the need to focus on a commissioning role. Four organisations were merged into one in order to achieve critical mass and provide a greater range of services locally, including a focus on mental health, learning disabilities and substance abuse (it was not clear how the provider and commissioner roles were separated). Although only six months since inception, the speaker stated that there had been over concern with organisational structure, an assumption that staff were signed up to the project, and failure to develop the user/carer engagement. The infrastructure had been provided but more work was needed on consumer opinion and feedback, whether the new partnership was truly integrated, and whether proceeding to Foundation

Trust status would bring any further benefits.

Finally in session 4 there were three workshops. The first from Kent, described the 'Avenues Community Support Team': a multi-funded agency with a mobile workforce supporting those with complex needs in the community. The client group comprised of mental health issues (65%), learning disabilities (25%), substance abuse (5%) and acquired brain Injury (5%).The facilitative preventative agenda reflected the presentation given in session one. The second workshop was called 'Connecting up health and social care: Futurebuilders Case Studies'. Futurebuilders is a government backed investment fund designed to help build the capacity of the third sector. Essentially Futurebuilders will provide loans and grants to organisations wanting to develop their contracts with public services such as local authorities, PCT's, direct payments and Job Centre Plus. For example, Trinity Winchester provides services for homeless and other vulnerable people, and in order to expand their services needed to move to larger premises. All Saints Community Development Company is planning a community and health centre in Birmingham to include a day care centre for children and a drop-in facility for older people. 'Building Blocks Solutions' provides a range of services for people with mental health problems, and wants to expand its non-medical support for people with low level mental health problems. The last workshop in this session was on 'Developing Evidence Based Approaches for Connected Care'; very little detail here, but pointers on how to collect evidence of success, and to the key stakeholders involved in most of the projects.

So what on earth has all of this got to do with wheelchairs or mobility? At an initial glance, not a lot, but I think we need to stand back and see how we could harness this integration agenda to our advantage. The provision of an appropriate wheelchair that allows a person to return to employment is an obvious one, but how do we capture the ability to participate in the school curriculum having been given a powered chair, the ability to benefit from lessons because comfortably sat, or the improvement in behaviour of a non-verbal client who is either more comfortable/ has greater independence and hence is less bored? Are there moving and handling issues that can be facilitated by a different chair, or carer burdens that can be reduced? We need to think 'around' our prescriptions to determine any added benefits, but ensure that we follow these up to assess whether the proposed benefit(s) has been achieved. PMG is the ideal vehicle to share these experiences and collect evidence to support occasions where greater initial expenditure results in decreased overall 'costs'. Once we have this kind of information, then we can have more robust discussions around shared budgets, and potential cost benefits for all.

European Seating Symposium – Pre-Symposium instructional course: Clinical Application of Pressure Mapping

Dublin, 1st-3rd May 2007

Report by David Long, Clinical Scientist, Nuffield Orthopaedic Centre NHS Trust, Oxford

I had been keen to attend the European Seating Symposium and when Kevin Humphries from Invacare offered me a ticket I jumped at the chance! Apart from the opportunity to take part in the main conference I was especially keen to attend the one-day pre-symposium instructional course entitled *Clinical Application of Pressure Mapping*. Having used pressure mapping systems clinically for a few years I could see benefit to both myself and the Oxford team from attending this course. In this article I have attempted to put across just a little of what I learnt.

The two course leaders were Stephen Sprigle, PhD, Physiotherapist from the Georgia Institute of Technology and Kim Davis, Physiotherapist, from the Shepherd Centre, Georgia (a rehabilitation hospital).

Pressure ulcer development

The session started with a discussion around the definition of pressure ulceration and went on to discuss the importance of assessing not only magnitude of applied pressure but also the duration of the applied load. Interventions for magnitude were identified as alterations in the support surface, use of positioning devices and postural strategies. Interventions for duration were identified as repositioning, weight shifting and use of active/dynamic surfaces (e.g. ripple mattresses). In addition, intrinsic factors such as increased cell metabolism from increased heat and resistance to collapse of blood vessel lumen were also discussed.

The crucial feature, of course, is to remember that when assessing pressure ulceration one cannot simply look at peak pressures alone.

Applied load (force), pressure and shear forces

pressure = force/area

The application of this formula was discussed. Where the same force is applied to a surface the greater the area, the smaller the pressure, and vice versa.

Forces act not only perpendicular to the support surface, such as a cup resting on a table, but also tangentially, such as when standing on a slope.

Tangential forces give rise to shear forces which are evident under the iscial tuberosities when sitting in an upright chair with the pelvis posteriorly tilted. Shear stresses tend to reduce blood vessel resistance to collapse.

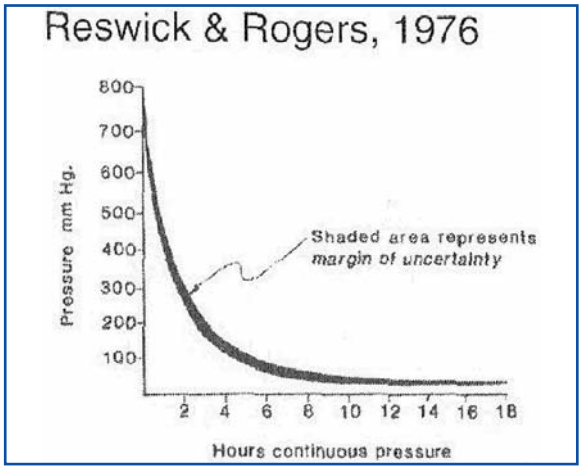
Pressure mapping systems usually only measure perpendicular forces. Such systems give no indication of shear stress.

Shear and friction

Friction was defined as a contact force that impedes movement. Friction is used to prevent or discourage movement and may therefore give rise to shear forces not only at the skin surface but within and between tissue layers. A typical example is found in a backrest recliner wheelchair where no ramped seat or tilt mechanism has been used, or the semi-recumbent position used in bed with legs out straight.

Background science

The work of Kosiak (1) was cited. Kosiak said that the greater the load, the shorter the time tissues can withstand that load before damage occurs. The well known graph of Reswick and Rogers (2) was displayed where pressure and duration of loading are shown not to be proportional to each other, with the area under the graph deemed to be "safe".



Of course this is an illustrative tool used to make a general point. It cannot simply be used to read off a sitting tolerance from a pressure reading taken from a mapping system. CR

It was suggested that the work of Landis (3), which states that a pressure exceeding 32mmHg is harmful, is misused in application to postural management as the study relates to capillary occlusion in the fingernail bed.

It is interesting to note the age of these studies. There has been a great deal of work on pressure ulcer development but many more recent studies refer back to these older pieces of research.

Pressure mat properties

Accuracy – a measure of the error between the measured value and the actual value. It was suggested that errors of 10% are typical for pressure mapping systems. Accuracy is improved by the calibration process (see later section).

Range – minimum to maximum values measured by the mat. Some systems report only up to the maximum value: saturation occurs where the cell is reading at the maximum value: if the range is 0-200 mmHg and the cell reads 200mmHg, this could indeed be a true value but it could also be true that the load is 201mmHg or indeed 2001mmHg. Some systems extrapolate beyond the maximum value but these are said to be more error prone. Conversely, low readings are more prone to error from background electrical noise.

It was suggested that the mat is calibrated to reflect the type of usage envisaged, e.g. 0-100mmHg for paediatrics, 0-300mmHg for adults. (It is noted that this is not always possible in an everyday clinical setting.)

Creep – this describes the way in which pressure readings gradually increase over time with a load applied. The changes are caused by mechanical changes in the mat sensors under the strain of the applied load and physical changes in the support surface and body tissues. Visco-elastic foams, for example, may take a few minutes to become more pliable compared to "normal" elastic foams. Most creep tends to occur in the initial few minutes after the load is applied. After this time the change in the readings begin to plateau. *Critically, when comparing cushions, take the reading at the same time after loading.* The authors were of the opinion that it is necessary to wait between 5 and 8

minutes before taking a reading to ensure stability. The effects of creep are lost immediately the load is removed.

Hysteresis – this describes the changes in reading which occur during the loading/unloading cycle. It is important to completely unload the mat and cushion between taking readings.

Limitations of pressure mapping systems

The authors were very keen to stress that they felt these systems are very useful clinical tools for identifying loading characteristics of support surfaces and to compare different surfaces, but that they *should not be used as a substitute for clinical reasoning*. They are best used to "rule out" rather than "rule in".

Snap-shot readings vs life in the real world

Static pressure readings do not typically reflect the range of postures and activities undertaken by the person e.g. self propelling, transfers, desk work, etc. Remote use of a mapping system will yield more representative data, but not all systems have this capability.

Interface pressure vs deep tissue trauma

Pressure mapping systems measure only the pressure at the interface of skin to support surface. They do not measure pressures in deep tissues and in the individual fascia.

Better outcomes?

It was said that no evidence exists to say that the use of pressure mapping systems improve outcomes. That does not, of course, mean that outcomes are not improved, merely that no valid research exists to confirm this. (A literature search has not been undertaken to investigate this fully).

Repeatability of single sensor readings

The author referred to his own study of 2003 which showed that single sensor peak pressures have poor repeatability, that is if you were to apply the same load to the same cell on two separate occasions, they would be unlikely to be the same. Unfortunately the full reference for this piece of work was not given.

Effects of mat presence on envelopment

Envelopment describes the way in which the supporting surface conforms to the person. It could also be termed shape absorption. The concern is that the presence of the mat prevents true absorption due to it having different stretch properties and thus not presenting a true picture of how the cushion will perform when the mat is not present.

In order to test this theory the authors produced a buttock model, instrumented with custom made individual pressure sensors located over and around the iscial tuberosities. Tests were then carried out on five mat conditions (four mats and no mat) with seven different cushions.

Two variables were measured: magnitude of pressure and envelopment (using pressure gradients – see below). In terms of magnitude it was found that the presence of each mat actually reduced the pressure on the buttock model. Envelopment, less surprisingly, decreased after mat introduction, except for one mat designed specifically to stretch.

Clinical usage hints and tips

Capture "the butt"

This is the terminology used by the authors to describe pelvis, buttocks and thighs so I too shall feel comfortable using the term.

- In general one must ensure that the entire butt is captured on the mat, rather than hanging off the back or the side. It is optimal to have a row of sensors clear along the back and down either side.
- Does it look like a butt? A basic question but one must be reasonably confident that spurious readings are not misinterpreted. A wallet in a back pocket may need to be removed. Personally I have seen a set of keys in a front pocket fall to the side and give a false reading. Other problems come from a wrinkled mat or clothing, or thick seamed clothing and, of course, presence of hoist slings.

Bony landmarks

One may have chosen to undertake pressure mapping to observe readings over a specific area or as a general check to see if a cushion is working well. Either way it is important to identify the following bony landmarks:

- iscial tuberosities;
- sacrum/coccyx;
- greater trochanters.

It will be necessary to palpate the pelvis in order to identify orientation and thus where the bony prominences are located. Pelvic rotation or obliquity will have a big impact and a subluxing, dislocated or significantly rotated hip will also produce unusual results.

Pressure gradients
More important than the maximum reading over a bony prominence is the rate at which that pressure drops away in the immediately adjacent sensors. If the pressure drops away gradually this would indicate good envelopment; if there is a sharp drop in readings then the supporting surface is not conforming well to the presenting prominence and we can therefore assume that pressure distribution is poor.

Support for the limbs, trunk and head
It is important to remember that the support given to the limbs, trunk and head all have an important role in offloading the pelvis.

Unsupported feet, footplates too high and unsupported arms can all make a significant impact on the pressure readings. A poorly supported trunk or head will also be unhelpful.

Inter-cushion reading reliability
It is important to completely unload the mat between readings and between different cushions. This allows the sensors to reset to zero thus nullifying the effects of mat creep, as described above.

Calibration
This is a procedure used to ensure that the sensors are reading to a reasonably high degree of accuracy. It was suggested that calibration should be undertaken every month for clinical purposes and much more frequently for research purposes. The capability to do this will be determined by what system you have, what level of service you have from the supplier and, usually, the financial resources available to you.

Peak pressure index
To go some way towards overcoming the poor repeatability of single sensor readings, the peak pressure index can be used (where available). It measures the selected cell and those surrounding, giving an average over a bony prominence.

Dispersion index
This gives the ratio of iscial tuberosity/sacral loading to total loading over the entire mat. Evidence is said to exist to say that a ratio of greater than 50% is to be avoided. The downside is that it can be clinically challenging to decide the boundaries of the bony prominences.

Tilt in space and unloading of tissues
It was suggested that the increasingly commonly used suggestion of needing to tilt to 55 degrees to achieve unloading of pelvic bony prominences is over simplified and often misplaced. The person, their posture, their function and seating set up all have an impact on what angle of tilt will achieve a helpful level of unloading of the tissues.

Use as an educational tool
A pressure mapping system can be used to demonstrate to the user the effects of various postures adopted on pressure distribution. A lean forward can relieve pressure from both iscial tuberosities. A lean to the side takes the loading off one iscial tuberosity. Postures adopted for function such as working at a computer or foot propulsion can also be analysed.

Analysis of posture(s) in lying
Of course pressure problems are not necessarily attributed to the seated posture. It may be helpful to use pressure mapping to analyse postures in lying, both supine and side lying (or even prone). This may be revealing and may help shape and justify recommendations regarding lying support surfaces and systems.

Documentation
The importance of annotating maps was stressed. Full descriptions of the findings should be included for future reference as multiple maps can be difficult to distinguish from each other. It was also suggested that correlating photographs are used to further enhance records.

Conclusions

- Pressure mapping should not be used as the sole deciding factor for cushion selection. It is a tool to assist the clinical decision making process.
- Pressure mapping systems do not usually measure shear forces.
- Pressure mapping systems measure only surface interface pressures.
- Pressure gradients should be the focus rather than maximum pressures.
- To limit the effects of skewed data from creep, pressure readings should be taken at the same interval after initial loading when comparing cushions.
- Envelopment is negatively affected by mat presence.
- It is important to locate the bony landmarks of the pelvis in order to understand the data being presented by the system.

Overall I found this three-day course to be extremely useful. The list above contains what I consider to be the main findings. In essence it is as important to understand what a pressure mapping system cannot do as well as what it can.

References

(1) Kosiak M, Aetiology and pathology of ischemic ulcers, Arch Phys Med Rehabil (1959) Feb;40:62-9

(2) Reswick J, Rogers J, Experience at Rancho Los Amigos Hospital with devices and techniques to prevent pressure sores (1976) in Kendei R, Cowen J, Scales J, Bed Sore Biomechanics (1976) 310, Macmillan, London.

(3) Landis E M, Microinjection studies of capillary blood pressure in human skin (1930) Heart 15, 207-228.

Wheelchair Postural Supports for Mobility – A Systematic Approach to Decision Making and Justification

Developed and Presented by Jill Monger, PT, MS, ATP.

Report by Geoff Harbach, Clinical Technologist, LEPMIS.co.uk

The PMG Education & Training sub-committee organised two separate training days in May 2007 at the Whizz-Kidz Regional Centre in Selly Oak. Jill Monger, Assistant Professor in Rehabilitation Sciences at the Medical University of South Carolina, was the course facilitator and below we have a report from one of the delegates, Geoff Harbach. We are very grateful to Whizz-Kidz for hosting this event.

This one day seminar, run on the 21st and 22nd of May, took place at the Birmingham Whizz-Kids Regional Centre, Selly Oak. Approximately thirty people attended from both the NHS and the private sector.

"Jill Monger is Assistant Professor in Rehabilitation Sciences at the Medical University of South Carolina, and has been a practicing Physical Therapist since 1984.

She began her focus on people with SCI at the Medical University in 1988 as the team leader for the SCI team. It was during this time that she began her specialty in wheelchair seating and mobility. Since then she has been appointed assistant faculty in the Department of Rehabilitation Sciences teaching courses in SCI rehabilitation, wheelchair seating and mobility, gait and prosthetics. She received her Masters of Science in Health Professions Education in 1998.

Jill has been teaching continuing education coursework in seating and mobility and other issues of severe disability since 1995. She has many years of experience working with people with severe disabilities as a PT, as a coach & classifier for wheelchair sports and as an advocate in the community. This experience has been invaluable in her understanding the long term needs of people with severe disabilities regarding their wheelchairs, cushions and other seating needs.

Jill Monger is currently a consultant locally and across the USA for individuals as well as those designing, manufacturing and recommending specialty equipment used by people with severe disability. She has in-depth knowledge and experience of research methods and practice, critical appraisal and literature search skills". **(Martin Moore. Chair, PMG Education & Training sub-committee, March 2007. Taken from P&MG web site, www.pmguk.co.uk/Education+and+Training/PMG+Courses).**

Jill gave a very in depth and comprehensive lecture on the principles of seating and postural management and also covered aspects relating to the choices to be made from different cushioning materials as related to pressure management and the prevention of sores due to both pressure and shear. A strong emphasis for the day was that of "function" within a seating system, and

that a balance had to be maintained between providing so much support that the client was not able to move or do anything, and not enough support with similar results.

Indeed "balance" was the key to maximising function. In order to be able to balance you required both stability and freedom of movement. Stability is provided by the seating surfaces and is dependent on the shape and format of the seating surface and also of the materials and techniques used in the manufacture of the seating components. Freedom of movement allows for increased function for those with independent mobility, and facilitates passive movement to ease postural pain and reduce contractures.

In the morning session, Jill suggested that there were three primary areas of concern when considering positioning for function.

1. **Functional needs**, these were:
   a. Balance
   b. Out of Bed
   c. Mobility – passive and independent
   d. Physiological function
   e. Daily activities
   f. Other activities – outdoors / lifestyle
   g. Transportation, (as opposed to mobility).
   h. Comfort – sitting tolerance.

2. **Postural Needs**, these included the relationship between:
   a. The head and upper extremities, with the head balanced and aligned above the hips and the shoulder girdle balanced above the pelvic girdle.
   b. The spine, positioning the head and UE's with its curves.
   c. The sacrum, influencing the spinal alignment and with the pelvis level and with slight anterior pelvic tilt.
   d. The hips, with thighs slightly abducted and the position of the pelvis influencing the sacrum.
   e. The feet, with ankles dorsi flexed just beyond neutral and loaded with midfoot below the knees, influencing the position of the legs, therefore pelvis, therefore spine, head and upper extremities.

   It was noted that the IT's are about 3.75cm lower than the femurs in the average adult, and about 1.25cm lower in small children. It was also noted that this relates to a posture with no deformities, and that the intensity and consistency of any deformities must be taken into account when considering seating, and should the time that they must be tolerated for.

3. **Skin Protection Needs**, these can be exacerbated by:
   a. An unstable and unbalanced posture
   b. Muscle Atrophy
   c. Immobility
   d. Poor circulation
   e. Incontinence
   f. Poor Nutrition
   g. Diabetes
   h. Cancer
   i. Loss of sensation
   j. Inappropriate transfer techniques

In the afternoon session, Jill focused more on pressure care and the technology features of the equipment used to manage it.

The different stages of classification of pressure ulcers were presented and it was noted that a number of areas may be at risk, including elbows, scapula, back of knee, bottom of foot and back of head. Insect bites, pimples or the propensity for cellulitis were also factors that can affect the formation of ulceration. Pure pressure ulcers can be characterised generally by a more rounded shape whereas ulceration from shear tends to be more oblong. It was important to recognise the difference between pressure and shear and the influence that different cushioning has on those effects.

It was noted that those persons who are confined to their bed or wheelchair for significant portions of the day were statistically at a much higher risk of developing a pressure ulcer, whilst at the same time acknowledging that 20 minutes on a pressure point can also lead to the formation of an ulcer.

Where underlying muscle tissue is involved, it was noted that it was necessary for the individual to increase their normal protein intake by about 100% in order to provide sufficient building material to rebuild the lost tissue over and above the normal day to day physiological replacement requirements.

With these factors in mind, it was necessary to check that pressure relieving cushions and mattresses were performing sufficiently, and that "at risk" clients could pressure relieve every 15 minutes or so, for about a minute. If the client is in bed then reposition every 2 hours and try not to have more than 30 of bed elevation. It was also noted that "donuts" were forbidden.

The advice was given to document your assessment findings and recommendations for pressure relieving equipment, even if you know full well that your particular service does not fund certain items, as this is useful for demonstrating shortcomings for funding or resources at a later date when service review takes place.

Another important factor in pressure management was that of the materials themselves. These can be broken into two basic types.

Solids: foam, gel
Fluids: air, water, other.

The solid materials were recognised as good for seated postural stability, but were more likely to generate shear forces than the fluid types. The fluid types were better for skin protection but not as good at providing postural stability. Hybrid solutions can sometimes provide the best of both worlds, and it should be remembered that the location of the application of the material is just as important as the material itself. The area to be supported should be maximised wherever possible so as

to reduce "force per unit area". Covers on cushions must be stretchable and permeable to fluids. They should also be washable and should not degrade quickly after repeated washing.

The notes from the presentation also included a very comprehensive check list for the "client physical evaluation", and included guidance on adjustments to the basic measurements that should be made in order to accommodate individual client needs, their seating and general external environment.

Finally, a section on translating the physical assessment results into an equipment specification was included, which again was very comprehensive and very useful.

This report is based on my notes from the day and on my personal interpretation of the principals spoken about. It only contains a small percentage of the information conveyed on the day and the supporting notes provided along with the presentations will be a useful reference source for the future. All in all, a very worthwhile day which included the presentation of an attendance certificate to all the delegates.

Contact details for Geoff Harbach:
Email: longeatonpmis@aol.com

National Association of Equipment Providers Conference

Norbreck Castle Hotel, Blackpool, 25th-26th June, 2007

Report by Dave Calder, Joint Head Rehabilitation Engineering Division
Medical Engineering & Physics, King's College Hospital NHS Foundation Trust

The National Association of Equipment Providers (NAEP) held its 2007 conference at the Norbreck Castle Hotel, Blackpool on the 25-26 June. The major theme of the conference was the future of service provision following the publication of the 'Care Services Efficiency Delivery programme' (CSED) conceptual 'retail market' model, with the conference opening to the signature tune of the film Mission Impossible.

The CSED programme was launched by the Prime Minister on the 22/6/2006 with a strong commitment to quality improvement. This drive was based on the historic negative reports that, regardless of past initiatives, have resulted in the same comments being aired by those trying to use the service. The major demands of users being personal choice and empowerment.

We were all reminded of the massive demographic change (population median age > 65 years) that the services will have to support in the future. Coupled with a challenging financial environment and it was generally accepted by the delegation that future state funding demand will increase and, if the retail market model is adopted, then staying the same will not be an option.

Lucia Fiveash, "TCE&WS" Programme Manager CSED, presented a general overview of the work carried out to date following the publication of the Community Equipment Service conceptual retail model on 31/5/2007. The next phase of the programme will firm up the retail model, which is scheduled for delivery to the minister for approval in the first quarter of 2008 with a target implementation date of April 2008.

The retail model was presented as CSED's best current thinking of the operating functions or components necessary to stimulate and grow the retail market to meet the unique needs of users now and in the future. CSED felt that the model, at the current 'outline business case' stage:

• is seen as broadly the right solution by the majority of stakeholders;

• has been developed to a sufficient level of robustness to demonstrate that further investment in resources is worthwhile.

Lucia explained that the retail model was conceptual and that there is still a lot of work to do. It is therefore important to recognise that as work continues and the design develops during the next phase of the programme, it will change. CSED will be working with their partners (North West region) during the next phase of the programme to understand how this model can be made a reality. It was emphasised that due to inadequate

data the model does not deal with the integration of wheelchair services. A programme to capture better information has been published, the results of which will be reported back to the Minister in Autumn 2007.

A healthy Question and very few Answers session followed with the major concerns regarding the retail model being:

- What about rural coverage?
- Floor did not agree with the concept that recycling should only continue for items over £20.
- Impact on the environment with the disposal of sub £20 equipment (clients will need to dispose of these items).
- Although one idea is to develop a National tariff, the average cost will be more expensive as it will now include a profit margin.
- Financial model used to support retail model does not seem to be correct.
- No mechanism to prevent pressure selling to client base.

Further information can be viewed on the CSED website (www.csed.csip.org.uk).

Anne Williams (Strategic Director of Neighbourhood Services, Adult Social Care, and Culture and Leisure Services, Salford) supported the need for change, although went on to say that such change must include self empowerment and felt that the major bottleneck of the current service was assessment and that low priority referrals need to be redirected from clinical resource by way of self directed support. Anne went on to emphasise the need to integrate Social and Healthcare

to allow the pooling of funding and clinical resource and closed with a number of challenges that the model posed:

- Did not believe that there was a single answer to the problem
- Self funding of equipment under £25 or assessment prescription cost (made up of a number of sub £20 items) could become prohibitive.
- Not sure that all costs have been included in the development of the conceptual model.
- More likely a 5+ year implementation programme

Anne then led an open forum regarding the CSED model. The main points to feed back were:

- Not one answer for everyone
- Need to explain new model and cost to individuals
- Public information is key
- How to ensure 7-day target
- Are all costs included in new model (advocacy, delivery)?
- How to achieve recycling targets
- How will decontamination be achieved (decommissioning and disposal)
- Need to have local councils onboard (decommissioning and disposal)
- Demographic and nursing staff need to be included
- Closure of stores – what happens next?
- Pressure selling to vulnerable people
- Quality vs. Price consideration

Caroline Ellis, Head of Parliamentary Affairs at the Disability Rights Commission (DRC), provided a passionate presentation regarding the use of the service. The basis being that all disabled people have the right to enjoy independent living and the need to empower the client. The DRC believes

that the current system is unsustainable and staff morale is low. Once again the speaker could see no committed mechanism for translating efficiency savings into better support for more people who desperately need it, rather the emphasis would seem to be on cost saving. In general there was an inadequate account of Human rights and what was actually needed was a more ambitious and courageous vision and reform programme supported by new legislation. Again a strong call for reform but balanced with a need for investment.

Gerry Kelly, Greater Glasgow Independent Living Equipment Service, described the benefits of a Public Sector service which included a healthy recycling scheme which recycles all equipment (sub £20) and as a consequence was able to issue £5m worth of equipment in 2006 of which over £2m was recycled equipment. Scotland is not affected by CSED at this time and they are watching with interest as the programme unfolds.

The ‘contracting out’ workshop looked at various models around the country,

the three predominant ones being In-House, Contracted out logistics, Contracted out service. Some of the smaller companies supplying equipment to the stores are worried with the possibility of larger suppliers providing the overall service and forcing them out of business. The general consensus of the group was the need to make Community Equipment Services available to those who do not meet criteria, which provides the opportunity to establish retail outlet and walk-in assessment. It was felt that the major drive (supported by NAEP) should be to develop service specifications with watertight performance clauses and monitoring statements and to engage commissioners now to demonstrate that all service models could deliver a future service.

The ‘Training workshop’ focussed on the need of client assessment, which is seen as the bottleneck. To attack this bottleneck it was felt that a Trusted Assessors Framework (KSF) needs to be developed that would license assessors at varying levels of competence. This will require a great deal of work and will need to identify staff competency, job roles and levels. Again it was felt that NAEP had a role to play in this.

The ‘Equipment & Eligibility workshop’ identified a number of concerns and felt that eligible users (state and self funded) of the service are any persons who need to access the service. i.e. Equipment users, prescribers, suppliers, regulators, etc. There needs to be a single set of rules for provision supported by NICE and that to support this a set of National levels of competency need to be developed. The group identified the issues surrounding the support of specialist equipment as regards to the availability of supporting technical information, spares and the lack of maintenance schedules.

NAEP have a website (www.naep.org.uk) that is worth visiting as it carries up to date issues regarding the CSED programme (check out the ‘TCEWS Questions’ on the ‘News’ page).

Posture Management for People with Complex Disabilities Oxford Centre for Enablement, 2006/7

Course Leader: Wendy Murphy, Physiotherapist and
Therapy Education Co-ordinator, Nuffield Orthopaedic NHS Trust
Course Team: Pat Posthill, Physiotherapist and David Long, Clinical Scientist

Report by Helen Aplin, Lead Therapist, Exeter Mobility Centre

July 2006: I joined with 15 other colleagues, only 1 of whom was male, of several nationalities, OT's and PT's, working in a variety of specialities with a connection to posture management.

One year and nearly 2 babies later (not mine I hasten to add!) we had all made it to the other end.

The year long course consisted of:

- pre-reading
- 3 x 1 week and one final day in Oxford
- 3 assignments
- 1 test

Week 1

After general introductions we started the course by looking at posture, both normal and impaired, applying it and looking at snapshots of case studies. If nothing else, we learned that normal posture is energy efficient, non-damaging and functional. Three very important statements repeated throughout the course and something that I try to refer back to each time equipment is provided.

Next came biomechanics which does seem very simple on paper and relating it to posture, but talk to me about forces, moments, action of these, stress and strain, Newton's Laws etc and I go blank. Anyway I've got the notes to refer back to!

Dr Gillie McNeill, OT and Neuro-Anatomist, did an incredibly enthusiastic whistle-stop tour of the brain. As a student many years ago I found the subject difficult to grasp and impossible to visualize. She was the most inspiring lecturer I have ever had on the subject; I was so inspired I bought the book she recommended and have almost read it from cover to cover and am keen to learn more as part of an MSc.

During the rest of the week we were introduced to the Oxford Assessment of Disability that Wendy has and continues to develop. It gathers detailed information on both physical and social profile in order to produce objectives for posture management. We also looked at measurement of joint range of motion, the Neutral-O Method. I had already been introduced to this at a 3-day course also run by Wendy with Pauline Pope. It was good to revisit and it seems to be a logical way to work. I have since been using this in my workplace, but sometimes need to refer to the book to make sure that I am describing joint ranges correctly.

Finally we looked at evidence-based healthcare and how to critically appraise research papers, with lots of very useful handouts to take away. Again it was something I had done before but this has given me a much greater understanding. It led onto our first assignment thus entrenching the information for ever hopefully. I regularly refer back to the handouts which are very comprehensive and easy to understand.

Helen (left taking notes) with her colleagues during a training session

Week 2

We all passed our assignments, had feedback and tutorials. Dr Terry Poutney talked to us on the Chailey Approach to Postural Management. Next came building a stable posture in sitting and lying, which I found particularly useful as we do not supply lying supports but are constantly recommending that they be considered as part of 24-hour postural management. It was good to look at the simple options and those outside of the box e.g. a snake from Ikea! I am now more confident in my recommendations.

Other useful sessions were the theory of customized supports, the materials, how they are used, watching a

moulding and having a go at using a bean bag. I picked up some very useful tips from Pat. I can now date the moulds that I do with the seating engineer to pre-course and post-course just by looking at them!

Finally we looked at the Oxford Assessment again and assessed real clients in preparation for our next assignment, a case study.

Not being practiced with the Oxford Assessment I was fortunate to find a patient who was easily accessible, as I had to go back 3 times, one of which was in hospital, to get the assessment completed. It was a useful exercise, as a colleague assisted with one of the visits which generated discussion on whom or how we could use the assessment within the time constraints that we have to work under.

Week 3

A nervous start to the week as we were to take a test, and for many of us it has been years since we did exams! We had feedback on our case study assignment and each presented our case studies to date. We had a morning on challenging behaviour and how to manage it. This is a compulsory part of our trust training and takes a day to cover. This half day was far more useful.

Post-test we did work on posing questions, finding and appraising literature. We worked in groups which was challenging as we all have slightly different ways of doing things. We then had introductions to action plans, our final and biggest assignment, something that had to be work based.

I chose to look at moulded seating, in particular the pros and cons of the different materials. There is very little research evidence so I decided to do a telephone survey of as many wheelchair services listed on the Wheelchair Managers Forum website as I could contact within a given time frame. I asked a series of questions including:

- Who was using moulded seating?
- What they used?
- Who makes the decision on what to use and how they decide what to use?
- Whether they have guidelines?
- How the moulding is done?
- Whether done in-house or contracted out?
- How many moulds of each material they prescribe?

This turned out to be a mammoth task and it took a full week of leave to complete the survey. Nevertheless it generated some useful information and has meant that we have started using carved foam as well as Matrix. It was interesting to see the numbers using each material, particularly MSI's which we have not used down in the South West for a number of years. I will be writing some guidelines for the centre on when to use moulded seating and making the decision on choice of material. When I have the information from the IT department I will be setting up a database of information on who has moulded seating, how often it is adjusted and look at cost effectiveness.

The final day at the end of June 2007 was attended by 12 of us. We presented our work-based assignments. This was extremely useful and there were some very interesting projects.

Conclusion

Learning is stimulating and increases enthusiasm. This course is very relevant to anyone involved in posture management and I would highly recommend it. Having to spend 3 weeks in Oxford gave me time out from work to allow for reflection, which has been invaluable. It has made me look at things that I have wanted to do for a long time but never had the time, although most of the work has been done in my own time.

I feel more confident in my work and have made a few changes, and hope to continue to do so.

I would like to thank my colleagues for their help, the medical library in Exeter for providing articles free of charge (well I haven't had the bill yet), Dr Roy Powell of the RDSU, all of the people in the wheelchair services who gave their time to answer my questions, the course tutors, and my husband and children.

Thanks also to Posture and Mobility Group for a contribution to the course fees and to the CSP Charitable Trust. I would recommend to anyone thinking of doing this or a similar course to apply for a bursary from PMG as I found funding from other sources almost impossible to obtain.

Contact e-mail: helen.aplin@rdeft.nhs.uk

Has it been Crash Tested?

Bob Appleyard, Q'Straint, www.qstraint.com
Chair of BSI Committee CH173/1: Assistive Products for People with Disabilities – wheelchairs

This article seeks to unearth the real intention behind the question 'Has it been crash tested?' The purchaser really needs to know whether the item is crashworthy. In order to get to grips with the real issue Bob Appleyard unwraps some layers surrounding the question including an overview of the test standards employed.

How often have we heard the question 'Has it been crash tested?' when talking about occupied wheelchairs for use in transport? The question should not be 'Has it been crash tested?' The question should be 'Is the wheelchair crashworthy and what are its limitations in use?'

We have to accept that access to safe transport is a key requirement for just about everyone these days, be it public transport in the form of a scheduled bus service, a taxi, or a private vehicle.

Whatever the size and type of vehicle, basic levels of occupant protection for the general public, in the event of that dreaded crash incident, have been considered according to vehicle type, and are written somewhere in either European law or national regulation.

The design of the vehicle seat, the occupant restraint system and their anchorage positions and strength – as well as the interior of the occupant compartment of motor vehicles – come together to play a vital role in reducing the severity of occupant injury during a collision. Provisions are specified after studying a broad cross-section of the generally able-bodied population – drivers and passengers of differing age, size and mass.

The safety of child occupants seated in cars is addressed by additional specific regulation that deals with their particular size and mass as they mature.

The requirements of wheelchair users

Frequently a wheelchair user has sufficient mobility to be able to transfer from the wheelchair onto a vehicle seat and then be restrained using a purpose-made vehicle occupant restraint system, whilst the wheelchair is secured as an item of luggage.

Where wheelchair occupants must remain seated in their wheelchairs whilst travelling because transfer is impossible due to their postural or clinical needs, the safety considerations are quite different.

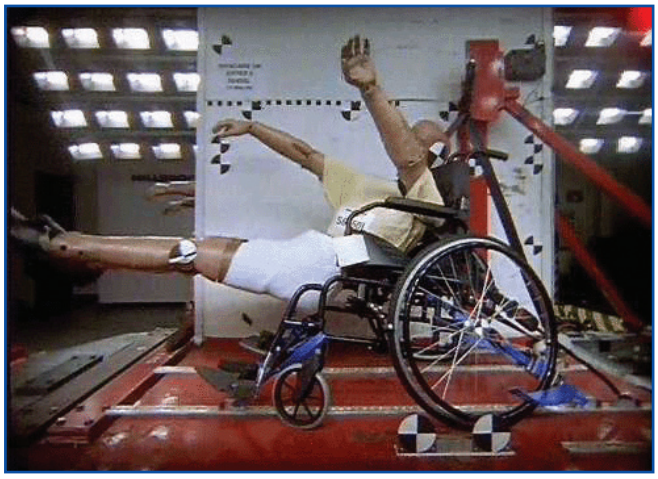
The wheelchair is not a product from the automotive sector, but a Class I Medical Device, designed to provide mobility and comfort for the user. It is now required to act as a vehicle seat, be fixed, stationary, allow for the routing of an occupant restraint system and be capable of enduring loads created in a crash situation.

Thus the wheelchair manufacturer needs to make sure that risks of injury to the occupant in a crash situation are either removed completely or reduced to an acceptable level. This in turn means that the manufacturer has to establish any limitations or conditions for use that need to be clear to a wheelchair user, carer, or purchaser.

The Test

The main tool used to evaluate the performance of a wheelchair in a crash is to undergo the dynamic sled test as given by ISO 7176 Part 19 – The 'Crash Test'. However, this standard was written to test the crashworthiness of a complete adult wheelchair. In the international version paediatric sizes were not covered (though there are means in part of ISO 10542 mentioned below). Likewise there is no published standard for wheelchair secondary postural supports, though part 4 of the ISO 16840 series of seating standards is working its way through international approval processes at this time: this uses a surrogate wheelchair and will be appropriate for testing seat base and back systems.

The result of not having a side wall-anchored shoulder belt anchorage



A classic case of abdominal intrusion due to poor geometry of the hip belt

The test procedure given in the Part 19 Standard calls for a wheelchair to be secured forward-facing onto the surface of a sled carriage, generally using a 4 point tie-down system. An ATD (Anthropomorphic Test Device), commonly called a crash test dummy, of the size and mass representing that of the intended user, is seated in the wheelchair in what is referred to as a 'normally upright position'. The ATD is then restrained using a 3 point lap and diagonal occupant restraint system, in a similar manner to that used by car seated occupants, except that the lap belt anchorages are attached to the vehicle floor and the shoulder belt anchorage to the simulated side wall of the vehicle.

After a series of pre-test measurements and photographs, the carriage with the wheelchair and occupant is then exposed to the crash simulation, observed by high speed cameras, the images from which will be used to determine performance. The severity of the crash is specified in the test procedure and is carefully maintained by the test service provider.

It is generally accepted that larger vehicles have lower general crash characteristics. The crash severity used in the Part 19 Standard is employed in a number of sled test procedures including the assessment of child restraint systems and also luggage retention devices.

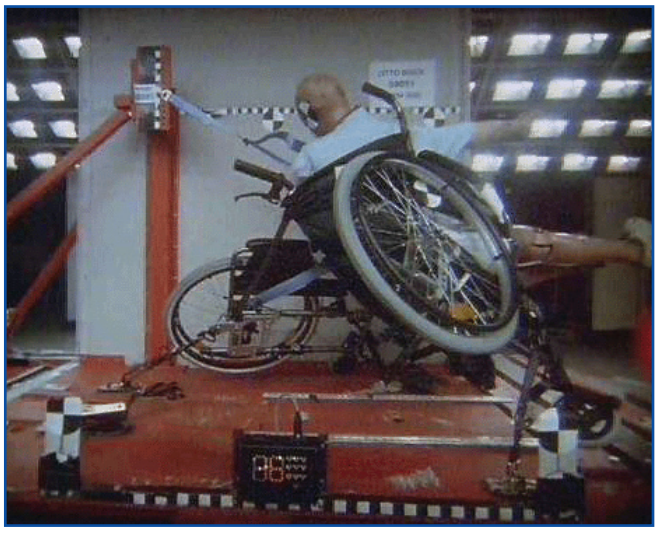
The severity is representative of the more aggressive found in all vehicle types, referred to as 20g/48kmh, that of a car with up to 8 seated passengers, not including the driver. Vehicles of this type are frequently used as base platforms by converters for wheelchair accessible vehicles (WAV's).

The pass-fail criteria given in Part 19 cover the essential performance of a wheelchair to act as a seat in a motor vehicle as an item of hardware. The Part 19 Standard also specifies requirements for the location and dimensional detail of tie-down attachment point and their marking on the wheelchair, so that compatibility with commonly available tie-down systems can be assured. There is also a method of assessment of how well the wheelchair allows the correct routing of an occupant restraint system, fundamental to the correct restraint of the occupant.

The requirements of wheelchair tie-downs and occupant restraint systems are covered in their own Standard, ISO 10542.

Ten years ago, wheelchair testing was in its early days and the outcome of testing provided frequent disappointments. It seemed at first that many more wheelchairs were failing the test in a catastrophic manner. But the situation has changed. Manufacturers now have an improved general knowledge of what is required to make a wheelchair crashworthy and success rates are much higher.

So does having satisfied the Part 19 dynamic test mean that the wheelchair is safe to use as a seat in a motor vehicle? The answer must be positive, as an item of hardware.



The result of failure of a tie-down attachment point on a wheelchair

Yet passing the Part 19 test alone does not mean that an occupant's safety is guaranteed in a crash situation. The wheelchair is just one item in a chain that makes up a system. It is so important to identify the other factors in the system relating to the safety of the occupant – in addition to the performance of the wheelchair.

When we consider the many different forms that

disability can take each individual wheelchair user's physical needs will be unique. The very fact that a person uses a wheelchair will almost certainly mean that their ability to tolerate injuries will be compromised when compared with non-wheelchair users. Be the user elderly and infirm, a child in a seating unit or bariatric, their needs will vary individually and measures will need to be taken to reduce the risk of injury to an acceptable level.

The provision of adequate wheelchair tie-down equipment, appropriate occupant restraint system with anchorage locations capable of providing correct geometry for passengers with a range of requirements, must lie at the core of risk reduction.

People using the equipment, be they family members or drivers and their assistants working in the community sector, must be made familiar with the use of the equipment and be capable of making informed decisions, understanding how to reduce the risks associated with the transport environment.

Let's not forget equipment maintenance. Wheelchair tie-downs and occupant restraint systems are also Class I Medical Devices, so they are not covered by annual vehicle inspection.

So there we have it, as part of the process of making a statement that the wheelchair is suitable for use as a seat in a motor vehicle, the wheelchair manufacturer will have used the Part 19 test to develop and produce a crashworthy product. All the information required, all the instructions for use and warnings and limitations, will be included in the User Instructions.

Contact Bob Appleyard:
e-mail: bappleyard@qstraint.co.uk
Tel/Fax: 01227 773035
Mobile: 07747 036656

Gaining Ethical Approval

Rachael King, Clinical Technologist Trainee and Dave Harrison, Posture & Mobility Services Manager
West Midlands Rehabilitation Centre, 91 Oak Tree Lane, Birmingham B29 6JA

The "E-motion" research project described here was awarded a grant by the PMG's Research & Development sub-committee earlier this year. The application was made with the project title ***"A single blind, controlled study to assess advantages of Pushrim Activated Power Assisted Wheelchairs".*** *As you will read, the project was held up, and in September 07, the research team presented a report to the R&D sub-committee explaining the delay. The sub-committee felt that the information in the report would be very useful to others embarking on research for the first time, and the team at West Midlands Rehabilitation Centre has very kindly given permission for it to be published as an article in the journal.*

The Emotion project is a PMG-funded research project run at the West Midlands Rehabilitation Centre (WMRC). The aim of the project is to look at both user satisfaction and energy consumption when using power assisted wheels. This has never been studied involving large numbers of wheelchair users and previous research has always been based in the lab. It is hoped that the findings from this project may provide evidence which will allow power-assisted wheels to be issued by wheelchair services. For this particular project Gerald Simonds kindly provided a set of Emotion Wheels for the trials; they also gave us the appropriate training to fit and remove the wheels.

This article has been written to highlight our experiences in understanding what was required before applying for ethical approval for the project, and to share the experiences with other services who may be considering research work.

In January 2007 the W.M.R.C. established a project team. The team consists of a Rehabilitation Consultant, Occupational Therapist and several Clinical Technologists (Rehabilitation Engineers).

In order to comply with the conditions of funding offered to us by PMG in January 07, ethical approval had to be in place before the project was able to start, because we are asking clients to use equipment that they would not use in their day to day lives. The first step, before making the actual application for ethical approval, was to establish a final project protocol. This process was very beneficial as it meant that a finalised plan and documentation for the project had to be defined - including the clinical assessments,

questionnaires and contact letters. This gave us a clearer picture of what needed to be done. The process also allowed a trial schedule to be drawn up. The protocol includes all the various questionnaires and contact letters required for the project, and a copy of the protocol was sent to the local REC (Research and Ethics Council) for ethical approval, along with the online NRES document (National Research Ethics Service, www.nres.npsa.nhs.uk, previously Correc).

A particularly difficult part of filling in the form for us was to establish who would be the project sponsor. Initially it was not fully understood what the responsibilities of the sponsor were. After some investigation we discovered that a sponsor is responsible for checking that arrangements for indemnity are in place if anything goes wrong, as well as making sure that the project is kept on track. This sponsorship proved quite tricky to get, but finally it was agreed that South Birmingham PCT would be our sponsor, as the project is very low risk.

All the documents have now been reviewed by the Local REC. We were given full information about when this group would meet, so were able to attend and answer any questions about the project. Their main issue was around the Information Sheet and Consent Form: although we had tried to follow the guidelines on the NRES website, we did not copy the exact format. As a result we were asked to rewrite our Information Sheet and Consent Form, and these are being resubmitted. Once the new versions have been checked, a letter will be sent to us giving ethical approval to continue with the project. When this ethical approval is gained, the initial contact letter can be sent out to our possible participants and the final 100 selected. These 100 participants will be contacted again to arrange dates for the trials.

In the initial timescale we estimated that the whole project would be completed within 12 months. However it has taken us nearly 8 months to sort out the information and paper work required, and to then apply for the ethical approval. The actual gaining of the ethical approval is not a complicated process as long as you have a clear idea of what you are hoping to achieve and how you are planning to do it. Make sure that all the protocol and documents required by the local REC are in place before filling in the online form.

Alongside gaining ethical approval the project also needed to be registered with the R&D department of the local PCT. This was a relatively easy process as they accept the documents required by the Local REC.

Gaining ethical approval has been a good learning experience for us, and next time the process will be quicker as we have learnt exactly what is required. Although this first application was a drawn-out process it would not put us off carrying out more research projects in the future. If you know what is required, the ethical approval itself can be gained within the 60 days projected by NRES, so we would just build in sufficient time within the planning to allow for the ethical approval process.

Contact email: rachael.king@sbpct.nhs.uk
dave.harrison@southbirminghampct.nhs.uk
Tel: 0121 627 8120

Small Research Study Funding Scheme: Report on the first project funded by PMG to complete

Wheelchair mobility for people following stroke with perceptual problems

David Punt, Reader in Neurorehabilitation, Faculty of Health, Leeds Metropolitan University

What is the nature of wheelchair navigation problems in people with unilateral neglect? Can affected people benefit from theoretically-driven strategies to improve navigation? Stroke is the primary cause of chronic mobility problems in the UK and affected people are often dependent on wheelchairs for their mobility. Some people who could otherwise benefit from a powered wheelchair are denied this opportunity due to acquired perceptual problems. These difficulties (e.g. unilateral neglect) can reduce their navigational skills such that they are generally considered unsafe under the relatively strict guidelines for provision. However, recent progress through research concerning the rehabilitation of perceptual deficits may offer affected people the opportunity to improve their navigational skills and thus offer them the opportunity to take advantage of powered mobility. This study aimed to harness these promising approaches to rehabilitation that have hitherto been mainly confined to measuring performance on laboratory-based tasks, and apply them to the real world activity of wheelchair navigation

Unilateral neglect is a relatively common perceptual disorder that affects patients following stroke and refers

to an inability or difficulty in attending to space on the side opposite brain damage. It is associated with poor recovery and many affected patients do not relearn to walk again and therefore might benefit from powered mobility. However, the nature of the disorder makes the safe navigation of a power chair problematic and patients are often unable to take advantage of powered mobility resulting in a corresponding reduction in independent mobility.

This study aimed to provide some preliminary data to document the nature of navigational difficulties. Seven participants with unilateral neglect undertook two carefully designed tests of power chair navigation. The tests were:

1. Wheelchair Assessment Course (WAC) – this involved steering a powered chair around a short 'obstacle course' where the number and side of collisions were counted.

2. Doorway Accuracy Test (DAT) – a finer-grained measure where participants were asked to navigate a central course though a series of openings. 3D motion capture was used to measure deviations away from midline.

Six participants each completed 10 trials of the WAC. All had left-sided unilateral neglect though varied in terms of severity. As predicted, participants made more errors on their affected side ($F(1,5) = 4.8$, $p < 0.05$). Figure 1 below shows the means (standard errors) for each participant.

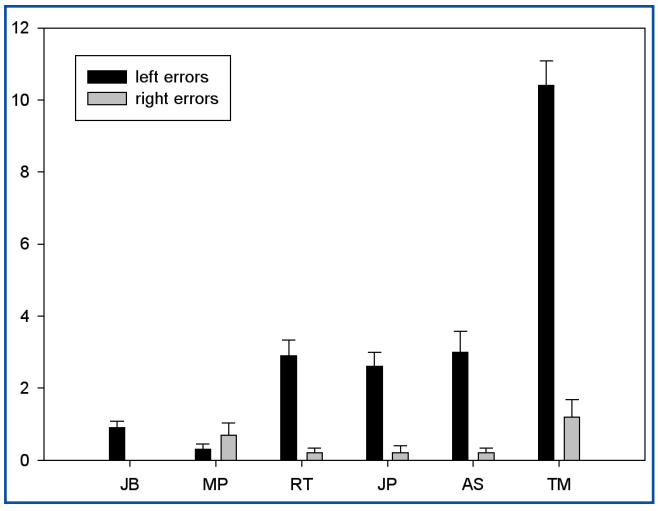


Figure 1. Individual means (and standard error) errors for each participant on the WAC.

Six participants also completed the DAT. However, RT was unable to complete this assessment. A participant with mild 'right' neglect (RH) completed the DAT along with the other 5 participants. Each participant completed 24 trials, 8 for the 3 different sized gaps. Participants demonstrated a reliable 'crossover' effect ($F(2,10) = 6.48$, $p < 0.05$), deviating to their 'unaffected' side for larger gaps but to the 'affected' side as the gaps became smaller (see Figure 2).

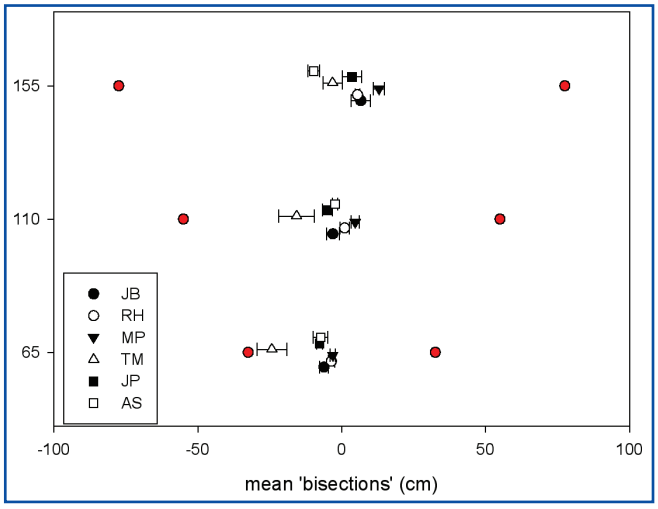


Figure 2. Individual means (and standard errors) for performance on the DAT

This 'crossover' behaviour is reminiscent of behaviour demonstrated by patients with unilateral neglect on pen and paper line bisection tasks.

This assessment work provided the basis for a number of single case studies that investigated the ability of participants to improve their performance using simple rehabilitation strategies. Strategies tested involved spatial cueing which was achieved by asking participants to steer the chair by using a joystick positioned on the affected side. In some cases (those with hemiplegia), this involved reaching across their body whereas others were able to use their other limb. To date, 3 of the 4 cases investigated were able to significantly improve their performance.

Further information

I would like to thank the Posture & Mobility Group for supporting this work. The research is part of ongoing work in collaboration with colleagues at The Universities of Hull (Johan Hulleman) and Birmingham (Keiko Kitadono, Glyn Humphreys, Jane Riddoch)

If you would like more detailed information, the P&MG have a full report (available on request) or you may contact me direct.. Aspects of the work have been submitted to an international peer-reviewed journal.

David Punt
Email: d.punt@leedsmet.ac.uk

Head and Neck Positioning

Barend ter Haar, BES Rehab Ltd, 131 South Liberty Lane, Bristol BS3 2SZ barend@besbiz.eu.com

The ideal postural support devices are those designed to support and complement the functions available, to enable the individual to do more than they would be able to do without the support. The head includes one of the heaviest organs of the body balanced on a flimsy support, the neck. Traditionally the head has been given a rest to lean against, but in reality a support is needed: a new device, the i2i, provides this as a new option for the therapist, engineer, and of course the individual.

Positioning of the head is most important to achieve the functions and interactions of everyday life. Apart from containing balance organs within the ears, we need to have our eyes positioned so that we can see properly to be able to use the rest of our body appropriately to carry out our normal daily activities. We also need to control our head so that we can carry out normal social interactions as we meet people eye to eye. Controlling our head position is obviously of critical importance for eating and swallowing. It is also important for appropriate breathing – anyone who has had any first aid training knows that the head needs to be back to open the pathways to the lungs.

On the other hand, the skull and its contents is one of the heaviest parts of our body, but it is balanced on a relatively small spindle, our neck. The advantage of this is that the bones of the neck allow the head to move in three dimensions: nodding up and down, rocking side to side, and rotating. The sacrifice for this range of movement is that good muscular and fine motor control is needed and therefore this is arguably the most difficult part of the body for us to control.

For those people with muscular or motor control disorders who require wheelchairs for their mobility and postural needs, their needs have so often been 'provided for' by the kind of restraint approaches seen in cars and aircraft. However, the ideal postural support devices are those designed to support and complement the functions available, to enable the individual to do more than they would be able to do without the support, not less, but they also need to be unobtrusive.

Many traditional items placed on wheelchairs to support and position the head have been head rests much along the design lines of those found in cars and planes: when positioned well they help protect against whiplash, but they neither support nor position. Some have a little more shape which may aid in positioning. Very few provide any support: the reason for this is that we control our heads with our neck muscles, and therefore we have to help the neck if we are to help the head. We need to get to the cause and not the effect. Traditional headrests have tried to address the effects.

The i2i

Leslie Johnson Fitzsimmons, a physiotherapist in the United States, has addressed this challenge, and developed a product in conjunction with Stealth Products, called the i2i. The i2i, which has taken over 6 years to come to fruition, has brought to the wheelchair arena a device which for the first time offers both positioning and support for the head by getting to the cause and by helping the neck. The shape is not new – Formula 1 racing drivers have similar supports to help protect against the G forces experienced when going round sharp bends. Participants on theme park rides have similar looking harnesses placed over their shoulders to protect them. So users get a device with the aesthetics from the exotic end of the sports world and from the adrenaline-pumped arena of recreation, instead of a large obtrusive head rest behind them.

Ease of Use and Innovation

So the i2i looks good, and with its padding feels comfortable. It is highly adjustable – for example the metal core to the arms that go over the shoulders are made of memory metal which can be reshaped time and

Caption?

again without fatiguing, to adjust for different clothing, positions, etc. The flip-down mount at the back makes for easy placement and removal.

The i2i provides good support in all directions, particularly anteriorly, but it also offers enough lateral and posterior support that after any extension or other activity the body is invited back safely into a midline position where the head is supported in a good anatomical position for eye to eye contact, eating, swallowing, breathing, and balance (please view accompanying CD). The i2i is designed not as a restraint, but to allow freedom of movement of the neck while presenting boundaries to limit neck extension. The optional chin prompt helps to limit anterior flexion, and acts as a reminder to the individual that his or her head is flopping forward.

Quality of Life

The important outcome of any assistive device is that it should provide a better quality of life. The i2i not only provides a better position for physiological function, but also permits improved social interaction with the world in general. Please see the case study in the box which shows a good example of how better head support has made a difference to the life of a lady, and her husband, in Scotland.

"The i2i was bought for use when I was in transport – this has been a real boon to me. For 6 weeks of the year we have the chance to go on day trips with our dial-a-journey wheelchair transport. Up to now I have only been able to go on one trip a week as I was in so much pain by the time I came back. I had to stay in bed for a couple of days at least to recuperate, and was wondering how long it would be before I would have to stop going altogether. I wore the i2i on our first trip this season and could not get over how good I felt the next morning. I had chosen a trip which was longer than my normal one (wanting to test this product as much as I could). I was up and about the next morning with no extra pain to that which I normally experience. The next week I booked two trips and neither being short journeys realised I was 'pushing my luck'. Again I was delighted with how I was the following day.

Not only has it improved my life, but also my husband's as he now has the advantage of the longer trips too."

Mrs Hazel Mackay, Stirling

"It's Not Too Much to Ask"

Campaign Report from BDF Newlife, April 2007

This challenging charity-led report outlines the extent of unmet need (and hence the amount of charitable funding needed to fill the gap) for children with disabilities throughout the UK. Using Freedom of Information legislation to request spending statistics from every PCT and Local Authority (many of which did not respond), the authors concluded that, on average, spending for each child on special needs equipment is little more than £30. Interspersed with real stories of unmet need and the impact on families, it makes very uncomfortable reading. The full report can be downloaded from the BDF Newlife website at www.bdfnewlife.co.uk

Clare Wright,
PMG Research & Development sub-committee

Priorities and Perceptions of Disabled Children and Young People and Their Parents Regarding Outcomes from Support Services

Report from the Social Policy Research Unit (SPRU) at the University of York, described here by Rachel Pitman, SPRU's Information Officer

Using the framework of 'Every Child Matters' (ECM)'s five outcomes for children, SPRU explored which outcomes disabled children and their parents wish to achieve from service provision. The full research report is now available.

The findings from this research were split into two: one summary describes the outcomes the disabled children desired and the other looks at the parents' desired outcomes:

Children

It was found that although disabled children aspired to the same sort of outcomes as non-disabled children, the

level of achievement expected, the way they were prioritised and what the outcomes meant, differedsignificantly. Some outcomes, e.g. physical and emotional well-being, communication and safety, were seen as fundamental and needed to be addressed before the others. Sometimes the goal was not progress but maintenance of an existing situation. The conclusion of the research was that there is a need to widen the definitions of key concepts within the ECM framework to take into account the views and capabilities of disabled children.

Parents

The desired outcomes of parents focused on maintaining or enhancing their personal identity, their physical and emotional well-being and their skill and knowledge base. There was a need for a better balance between their caring and parenting roles. Family-level outcomes were also desired, including maintaining family life and ensuring the positive adjustment of siblings. Parents also wanted to feel confident about the services they were using and to know that professionals were working in partnership with them.

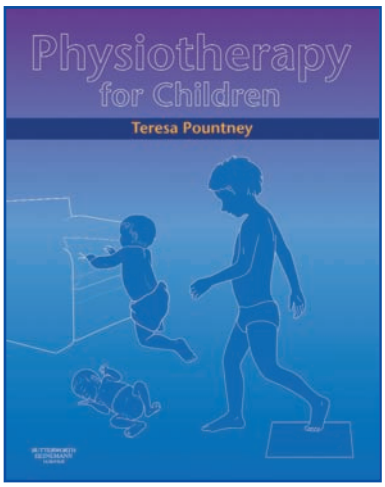
The full research report and each of the Research Works summaries can be downloaded from: www.york.ac.uk/inst/spru/pubs/cfreps.html

Contact details for Rachel Pitman:
Email: spruinfo@york.ac.uk
Tel: 01904 321979

"Physiotherapy for Children"

Edited by Teresa Pountney, Research Lead/Physiotherapist, Chailey Heritage Clinical Services, East Sussex published by Elsevier Ltd www.elsevierhealth.com

Review by Joanne McConnell, Editor PMG Journal



I have had the great pleasure of reviewing the excellent new book "Physiotherapy for Children" by Teresa Pountney, and the fact that I am a Paediatric O.T. who has found a huge amount of useful material in its 350 pages speaks for itself. I have 16 years experiences as a Paediatric Occupational Therapist, with the last 8 years specifically in the specialist clinical field of paediatric posture and mobility, but I have found this book to be an excellent tool for reflecting on current assessment and treatment techniques; also as a revision tool to keep up to date in areas of paediatrics that you may not get to work in very often.

I particularly found useful the strong emphasis on evidence-based practice and the concise overview of a useful selection of evaluation and measurement tools, both standardised and non-standardised.

I personally valued the chapter on *neo-natal care*. It was very informative as it is an area of paediatrics that I have never worked in; but so many of the children we deal with have started their journey in neonatal care. Now more than ever, with the advances in technology and medical science, increasing numbers of very premature babies survive.

Other chapters that are most informative are those on *oncology and palliative care* and the chapter on *paediatric intensive care*. Both areas are extremely sensitive and incredibly specialist and the authors came across as genuinely caring about these areas of paediatrics giving the reader a real insight into their clinical specialties.

There is such a wealth of information in every chapter from authors who are experts in their field of clinical practice. The book is easy to read and would be an excellent study tool for students of physiotherapy, occupational therapy, speech language therapy to name but a few, and for any clinician working in the field of paediatrics or wanting to learn more about paediatrics. There are some excellent case studies and the photographs and illustrations really bring the book to life.

I would recommend this as a "must have" for your book shelf, and only wish it had been available when I was a student and when I was starting out as an O.T. Look out for it at the bookshop in Warwick at the next NTE and perhaps spend your PMG book voucher on it? It is priced at £39.99 or €59.99. It would be a worthwhile addition to any therapist's bookshelf.

To order from the publisher go to http://intl.elsevierhealth.com/
ISBN: 978-0-7506-8886-4

"Family-centred Support for Children with Disabilities and Special Needs"

Edited by Peter Limbrick with foreword by Christine Lenehan
Published by Interconnections

"This powerful collection of essays is a welcome and timely contribution to the lives of families of disabled children. They illustrate the overwhelming importance of the quality of emotional relationships between parents and professionals…"
Christine Lenehan, Director,
Council for Disabled Children

ISBN 0-9540976-3-7
Price: £17.50

For further information and to order the book please visit www.icwhatsnew.com/publications/family.htm

Team Around the Child
Working together in early childhood intervention

Edited by Sue Davies, Kurrajong Early Intervention Service, Australia
Foreword by Professor Barry Carpenter, University of Worcester, UK
Published by Kurrajong Waratah 2007

"The transdisciplinary team model is widely recognised as best practice for early childhood services…. It is the model that best meets the needs of families who have children with complex needs …. (p 43)

Peter Limbrick writes: Transdisciplinary teamwork, in my view, is characterised by whole-child and family-centred thinking….it is an antidote to too many people working with the child and too many separate discipline-specific programmes. Any service or professional seeking assurance that transdisciplinary teamwork for children and families with complex needs is both effective and achievable will be inspired by this publication.

To order the book please visit www.icwhatsnew.com/publications/kurrajong.htm CD attached to each book: *Outcomes Measurement Tool Kit.*

For further information visit: www.kurrajongwaratah.org.au

NEWSRound
Maintaining Independence in the Home with Posture & Mobility

Craig Egglestone, I Eng, Rehabilitation Engineer
RREMS, Disablement Services Centre, James Cook University Hospital, Middlesbrough, TS4 3BW

This article is about Joan, a 50 year old client who suffered a brain haemorrhage in 1998 which resulted in a right Hemiplegia and confined her to a wheelchair. She also suffers from severe rheumatoid arthritis.

Joan is fiercely independent and wishes to remain in her own home. She was supplied initially with an electrically-powered indoor wheelchair (Bencraft Apollo) shortly after her stay in hospital. She lives in a purpose built bungalow in the community with the aid of carers who attend 5 times a day; she has a possum environmental control system and emergency care call system. She attends a day centre twice a week.

Over the years the powered chair has been replaced, firstly by another Apollo then a Newton Badger and latterly a Lomax Travvla EPIOC.

A referral was received by her district wheelchair services requesting a re-assessment following a change in Joan's posture. Following an initial assessment it was clear that she required some form of special seating to maintain her posture in the EPIOC.

A domicilary visit was made by a wheelchair assessor, rehabilitation engineer, and seating engineer. At this assessment the following issues were highlighted:

After a period of time in the powered chair Joan had to struggle to maintain a midline posture in the seat and tended to lean further and further over to the left; this was compounded by the controller being on the left hand armrest. If support was introduced to maintain her midline position she would not be able to operate the std Pilot controller mounted on a sliding controller bracket. The chair was fitted with the manufacturer's tray to mount the display for the Possum environmental control and also for meals. Ideally the controller needed to be mounted on the tray close enough for Joan to operate; however this would mean affixing it to the tray, and then Joan would not be able to use the tray at times when the carers were not present.

A referral was made to the Technical Aids Service within the Regional Medical Physics Dept for a powered swingaway controller bracket to mount the joystick. At the same time a cast was taken to provide a bespoke moulded back support from the seating contractor. A mid fit was arranged for fitting of the moulded back support, which was mounted using the PHP V-Track mounting system. At the same time a trial was done of the prototype controller bracket. This consisted of a Dudley chin control bracket modified to hinge at the side, coming in from the right hand side of the wheelchair and incorporating a linak actuator to swing it in and out. The operating single switch for this was initially placed on the tray, but Joan could not consistently operate it, and so it was moved to the side of the headrest.

Joan at home

Due to the dedication and efforts of all the services involved Joan has indeed remained independent in her own home.

Contact details:
Email: Craig.Egglestone@stees.nhs.uk
Tel: 01642 282895

Thanks to:
Peacocks Medical Group, suppliers of moulded back;
Technical Aids Service, Regional Medical Physics Dept for powered joystick mounting;
Sunderland Wheelchair Services & RREMS for joint provision of EPIOC.

NEWSRound

This section is devoted to the various countries and regions where PMG members live. Our first article is by Craig Egglestone from North East England. If you participate at work in a regional project please consider writing about it for the journal. If you live in Eire, Northern Ireland or Scotland, we now have the following correspondents there who have kindly offered to help any PMG colleagues interested in writing something for the journal, or collaborating on an article.

Eire
Phelim Quinn
Clinical Engineer
Seating and Mobility Dept.
Central Remedial Clinic
Vernon Avenue,
Dublin 3.
www.crc.ie
email: pquinn@crc.ie

Northern Ireland
Dr Peter Watson