National Training Event 2009
"Pay Now, Save Later"

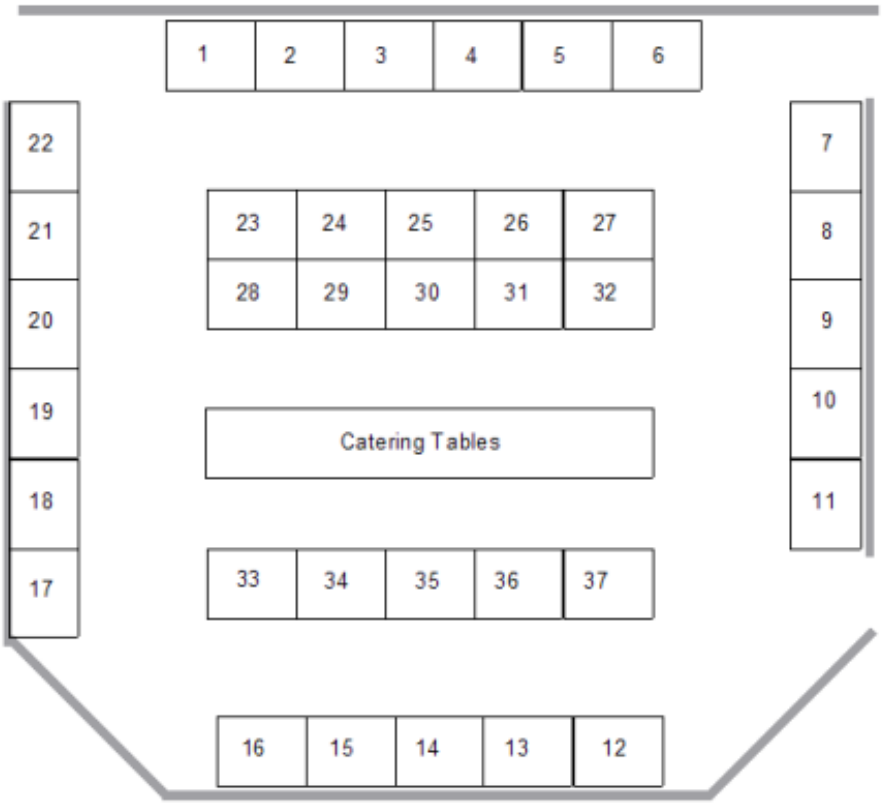
Warwick Arts Centre, University of Warwick,
15th – 17th April 2009

PMG
POSTURE & MOBILITY GROUP

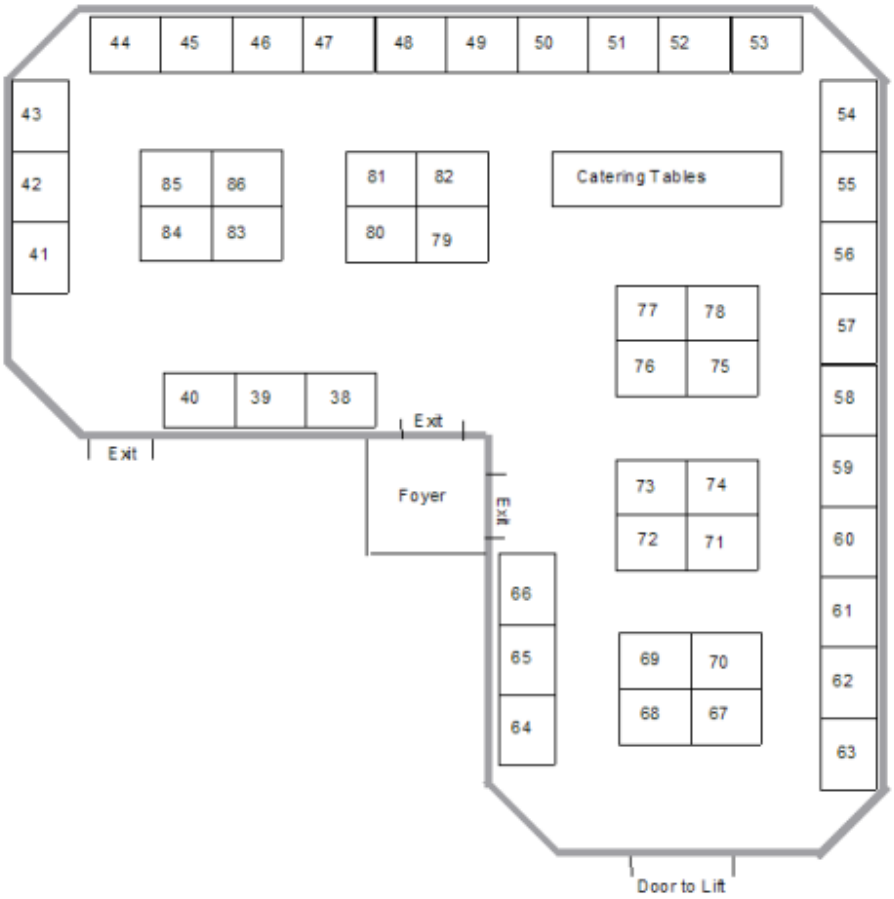
COMPENDIUM

Includes Exhibition Catalogue
&
Abstracts of Conference Presentations

Butterworth Hall Plan



Mead Gallery Plan



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Active Design Ltd

Stands: 83, 84

68k Wyrley Road
Witton
Birmingham
W Midlands
B6 7BN
United Kingdom

Tel: 01213267506
Web: www.activedesign.co.uk

We design and manufacture equipment for a twenty-four hour approach to postural management.
This year we have some exciting new developments. We have expanded our range of Actiflex products, and our volume pricing policy ensures you can make significant price savings over similar products, whilst retaining the highest level of quality and performance.
As part of our commitment to training, we will also be launching our eLearning tool as part of our strategy to make our education modules more flexible and accessible.

Assistive Partner

Stand: 53

Business Innovation
Harry Weston Road
Coventry
CV3 2TX
United Kingdom

Tel: 08712007051
Web: www.assistivepartner.co.uk

Assistive Partner has the most exciting and versatile computer systems software applications imaginable. Ask for a demonstration of specialist application UNIQUS which can manage wheelchair services, community equipment, specialist services, surgical decontamination centres and much more. See us at PMG, check out our website or call us today.

Represented by: Julian Cobbledick, Ian Slaughter

BES Rehab Ltd

Stand: 79

BES Rehab Ltd
131 South Liberty Lane
Ashton Vale
Bristol
BS3 2SZ

Tel: 08451300237
Fax: 08451300238
Email: info@besbiz.eu.com
Web: www.besbiz.eu.com

Setting up a wheelchair correctly first time is every therapist's aim, but it's easier said than done. Repeat visits are expensive and time-consuming for everyone. A poorly set up wheel chair is expensive in more than time and money for the user who develops repetitive strain injury (RSI) or pressure problems. BES Rehab has two products to make wheelchair set-up easy and efficient – the SmartWheel from Three Rivers – Out-Front and the Prime system from FSA.

The SmartWheel fits onto any quick release hub. It allows observation and recording of the hidden forces involved in wheelchair propulsion. Choice of best chair, axle position etc becomes straightforward, with objective justification to back up decisions. It also allows analysis of propulsion style and other factors contributing to ineffective propulsion and RSI.

The FSA Prime is the latest development of the popular FSA pressure mapping system. Integral module and mat are quick to set up, easy to use and give the same easy to read clinical data as the full FSA system. An economical way to ensure that all aspects of the chair: foot support height; arm support height; choice of cushion etc, are optimally selected and set up for the user.

Crashworthy backs - fully tested and approved, are also featured on the stand. The Varilite tall and deep backs with new back hardware meet these stringent requirements.

Cushions from Varilite meet the needs of users from the simplest to the most complex. Ask at the stand for a demonstration of a cushion for your specific requirements.

Represented by: Sasha Long, Linsay Stevenson, Mark Amos, Steph Bayley, Shirley McKenna, Stephen Cavanagh, Barend ter Haar

BES Rehab Ltd - Bodypoint

Stand 5

BES Rehab Ltd
131 South Liberty Lane
Ashton Vale
Bristol
BS3 2SZ

Tel: 08451300237
Fax: 08451300238
Email: info@besbiz.eu.com
Web: www.besbiz.eu.com

BES Rehab has worked with Bodypoint for many years to provide the highest quality, innovative postural devices. The new ergonomic Hip Grip 2 pelvic stabilisation device is sleeker, easier to fit and more effective than ever before. Also on display are the Monoflex chest harness and the new Bodypoint shower belts.
Represented by: Sasha Long, Linsay Stevenson, Mark Amos, Steph Bayley, Shirley McKenna, Stephen Cavanagh, Barend ter Haar, Kathleen Higgs

BES Rehab Ltd - Stealth Head Supports and Laterals

Stand 6

BES Rehab Ltd
131 South Liberty Lane
Ashton Vale
Bristol
BS3 2SZ

Tel: 08451300237
Fax: 08451300238
Email: info@besbiz.eu.com
Web: www.besbiz.eu.com

For all your head support needs we offer the Stealth range: combinations of the Ultra, Comfort, and the legendary i2i. We can also aid you with switches and other wheelchair accessories, including “The World’s Best Laterals”.
Leslie Fitzsimmons is booked to come back to the UK for a lecture tour in June – sign up for this now.
Come and see us on stand 6: find out how Easter eggs are made, and place your entry in our Easter Egg draw. We look forward to seeing you.
Represented by: Sasha Long, Linsay Stevenson, Mark Amos, Steph Bayley, Shirley McKenna, Stephen Cavanagh, Barend ter Haar, Filipe Correia

Biosense Medical Ltd

Stand: 74

Biosense Medical Ltd
10/11 Eckersley Road
Chelmsford
Essex
CM1 1SL
Tel: 0845 2266442
Fax: 0845 2263457
Email: sales@biosensemedical.com
Web: www.biosensemedical.com

Biosense Medical Ltd is a major distributor of medical technologies in the UK and Ireland and specialise in computer based diagnostic equipment that is used in the fields of amongst others Biomechanics, Posture & Balance and Podiatry. We will have a full range of products on display including the Conformat seated and body pressure measuring system from Tekscan with the very thin sensor that s-t-r-e-t-c-h-e-s, thus reducing to minimum the hammocking errors associated with sensor construction.

Represented by: Philip Baxter

Blatchford Ltd

Stand: 18

11 Atlas Way
Atlas North
Sheffield
South Yorkshire
S4 7QQ
United Kingdom

Tel: 01142637900
Web: www.blatchford.co.uk

Customised Seating at its very best.

Chunc Posture and Mobility

Stands: 56, 57

Rotherwas
Hereford
Herefordshire
HR2 6JZ

Tel: 01432 377512
Email: sales@chunc.co.uk
Web: www.chunc.com

Chunc is committed to providing a world class postural management system for moderate to profoundly disabled young people. As such our range of chairs has been designed in close collaboration with Health Care Professionals, Carers and Parents of disabled young people. This partnership enabled the design team to create a unique chair that effectively provides for an extensive variety of needs experienced by disabled young people and those involved in their care.
The adaptability and versatility of the support options on the chair enables the therapist to optimally position and support the user in the chair. This ensures the most biomechanically efficient position of the pelvis and spine for that individual can be achieved as well as ensuring excellent support to the thighs, feet and head. Through the use of this highly effective and comfortable postural management system, the user will be able to achieve an improvement in the facilitation of cognitive, communicative and functional skills. This provides a solid foundation for an enhancement in participation with peers, carers and parents. Furthermore, it ensures that the child is optimally supported to prevent or reduce deformity, or as in some cases, able to accommodate deformity and prevent further deterioration.

Consolor Ltd

Stands: 71, 72, 73

Unit A3
The Forelle Centre
Ebblake Industrial Estate
Blackmoor Road
Verwood
Dorset
BH31 6BB
United Kingdom

Tel: 01202827650
Web: www.consolor.co.uk

Consolor Ltd is committed towards the provision of seating products & specialist services to an ever-increasing number of districts throughout the UK. At PMG 2009 Consolor Ltd is proud to present the following UNIQUE products:

MATRX SEATING SERIES: represents a unique range of cushions & backrests that are designed to provide precise levels of postural support and pressure care, available in a vast range of size options that is un-surpassed by any other product on the market.

The new MATrx Vi cushion comprises of a composite structure of two types of high resilient foam, which are both anatomically shaped for improved comfort and support. In between these two layers is a centre layer of anatomically targeted ‘visco foam’ for added ischial/coccyx pressure relief.

All of the MATrx range of backrests are fully compatible with the same hardware system. This takes the ease of backrest provision to a new high, as backrests can be easily swapped for alternative sized/shaped backrests without the need for tools. In addition the fitting of the hardware is completed in minutes with only 1 Allen key required for installation and adjustment - simple!

VAKUFORM cushions & backrests represent a unique combination of vacuum technology, with highly flexible skin friendly Neoprene. Air is added to each support to enable it to dynamically contour the profiles of the end user, prior to the support being vacuumed to form a strong precise negative of the end user.
By regulating the level of vacuum, the supports can be adjusted to determine the precise level of support required providing the end user with all the benefits associated with the provision of a truly bespoke solution, but with the added ability to be reshaped to suit. This is of particular benefit in cases of pre or post surgery, where the usual supply of a temporary solution is at the cost of precision and comfort. VAKUFORM products are also available in the form of accessories, such as arm & leg supports, headrest right through to positioning and sleep systems.

Days Healthcare

Stands: 39, 40

North Road
Bridgend Industrial Estate
Bridgend
CF31 3TP

Tel: 01656664700
Web: www.dayshealthcare.com

Days Healthcare is proud to be a leading player in the UK mobility and rehabilitation industry. With over 40 years experience we specialise in providing solutions to a wide variety of needs to a wide variety of customers. We are a major supplier into the NHS as well as servicing charitable organisations, independent professionals, nursing and residential care homes and our many retailers.
We work closely with Government bodies, such as the Department of Health, and professionals like the Infection Prevention Society and the College of Occupational Therapists and are members of the British Healthcare Trade Association.
But the people who really benefit from our expertise are the 2 million customers in the UK, and the many thousands more overseas, who use and trust Days Healthcare products everyday, throughout their daily activities.
With our comprehensive product range, we provide the means to give you more confidence and support in your everyday life. From a wide range of manual and power wheelchairs to homecare and bathroom aids to day-to-day walking aids, Days Healthcare has an extensive product portfolio to cater for you no matter what your needs.
Days Healthcare has distributors in Europe and the Middle East and is part of the DCC Group. With their headquarters in Dublin, DCC have international operations across four continents, employing over 7000 people in 16 countries. Being part of this global organisation secures Days Healthcare's platform to provide you with the very best product range at competitive prices.
Based in South Wales, Days Healthcare employs just under 100 people, all dedicated to providing the highest possible service to our customers including same day/next day despatch from our extensive warehouse and its £10m stockholding.

Delichon Ltd

Stands: 46, 47

1 Hale Reeds
Heath End
Farnham
Surrey GU9
9BN
United Kingdom
Tel: 01725 519405
Fax: 01725 519406
Web: www.delichon.co.uk

Foam-Karve has continued to lead the field with innovation and improvements, giving an obvious choice when specifying custom seating. We pride ourselves on a versatile product supplied by highly experienced friendly seating specialists. Our turnaround times are second to none, with regular clinics receiving completed seating back two weeks after the initial casting. On-site karving reduces the errors between cast and karve and means everyone can be present for casting and trial fit, which take place at the same appointment. Visit our stand and see how we can help you improve your custom seating.

Dynamic Europe Ltd

Stand: 52

Unit 7
Finepoint Way
Kidderminster
Worcestershire
DY117FB

Tel: 01562826600
Web: www.dynamiccontrols.com

Dynamic Controls is the world's leading manufacturer of electronic controls for power wheelchairs and scooters.
Certified to ISO 13485, Dynamic goes above and beyond industry standard expectations to ensure customers receive the best products possible.

The Dynamic philosophy is what sets us apart from the rest. We believe that our commitment to technology and quality, innovation and our people - the essence of the Dynamic way - is what gives us the edge.

Technology & Quality
Bringing innovative ideas to life with superb, consistent quality at internationally competitive prices takes the very best technology. Dynamic invests heavily in the latest design, manufacturing and product technology to surpass the highest international regulatory standards and give us the international edge. There can be no mistakes. Every facet of the Dynamic organisation - the people - the equipment - the processes - is based on the word "quality", giving you the confidence you need in a business partner.

Innovation
If there is a better, more practical, cost effective way of doing something, we will find it. This is the mindset that pervades Dynamic - whether it be innovation in technology, processes, manufacturing or problem solving. It is no exaggeration to say that Dynamic has been responsible for many of the major developments in our fields of expertise, with an impressive list of "firsts" in our respective industries.

People
You can only get the best results if you have the best people. Top individuals and a culture that brings them together as a team results in a company that is more than the sum of its parts. From the sales team that listens to your needs and a manufacturing team that delivers to those needs - Dynamic's international achievements speak volumes about the quality and commitment of the people that make it all happen.

First Technicare Co. Ltd

Stand: 7

10 Acorn Industrial Est
105 Blundell Street
London
N7 9BN

Tel: 02076098761
Web: www.firsttechnicare.com

First Technicare have been innovators in the supply of technically advanced pressure care products into the NHS for over twenty years. Taking into account the need of every individual, we provide bespoke, “made to measure” unique and innovative products. We are delighted to introduce our latest innovation - the new “Gem Stone Collection”. A range of cushions incorporating materials of the highest specification. The cushions have been designed to vastly improve comfort and effective weight dispersion over long periods and also assist with general positioning. We invite you to visit us and experience the difference for yourselves. Intelligent innovation with integrity from First Technicare.

G-code Technology Ltd

Stand: 48

12 Hadrian Close
St Albans
Hertfordshire
AL3 4JY
United Kingdom

Tel: 01727810270
Web: www.g-codetechnology.co.uk

CNC Router Machines, Software and Laser Scanning for Cutting Foam for Digital Seating

Gel Ovations Europe

Stand: 42

2 Stover Road
Yate
Bristol
BS37 5JN

Tel: 01454 285071
Fax: 01454 314501
Email: john@pearcebrosmobility.co.uk
Web: www.gelovationseurope.com (in progress)

Gel Ovations Europe will be exhibiting a wide range of gel wheelchair accessories that provide the ultimate in comfort and pressure care.
Every client, clinician and rehabilitation products dealer is always looking for the best interface between the wheelchair user and the legs, arms, brackets and positioning devices that are part of that wheelchair.
That’s why Gel Ovations was created. Using a proprietary hydrophilic gel offered in a variety of configurations and attachable surfaces, Gel Ovations has the industry's best solutions to improving comfort and reducing pressure.
Represented by: John Payne and James Payne.

Gerald Simonds

Stands: 8, 9

9 March Place
Gatehouse Way
Aylesbury
Bucks
HP20 1NU
United Kingdom

Tel: 01296380239
Web: www.gerald-simonds.co.uk

Gerald Simonds is the leading national supplier of wheelchairs and pressure relieving seating products in the UK. At stands 8 & 9 we will be exhibiting products from the world's leading manufacturers including Vicair, Jay, Alber, Levo, Handicare & TiLite and our friendly and experienced staff will be on hand to discuss any of our products and services with you.

Greencare Mobility Ltd

Stand: 49

Simcox Court
Riverside Park Road
Middlesbrough
Cleveland
TS2 1UU

Tel: 01642223322
Web: http://www.greencaremobility.com/

Greencare Mobility – Individually Built Wheelchairs.

In sizes from 13” to 24” (27” out rigged) with occupant weight up to 175kg (28+ stones) these English built chairs are modular with a huge range of options. Configurable as required or as 8BL’s, simple 9L’s through to complex fixed recliners, these chairs are a one stop solution for clinicians seeking a specialist solution in a standard chair.

Handicare Ltd

Stand: 14

68 High St
Weybridge
Surrey
KT13 8BL
United Kingdom

Tel: 01932858687
Web: www.handicare.co.uk

Handicare offers solutions and support to increase the independence of disabled or elderly people as well as to improve the convenience of those who are caring for them. Our wide range of high-quality products includes various power and manual wheelchairs, children’s wheelchairs, scooters and seating systems.

The Helping Hand Company

Stands: 65, 66

The Helping Hand Company
Bromyard Road
Ledbury
Herefordshire
HR8 1NS

Tel: 01531 635678
Web: www.helpinghand.co.uk

The Helping Hand Company – British manufacturing for over 30 years: better by design; therapist approved; from supplier of choice with service you can trust.
Come and try out the unique positioning and stability delivered exclusively by the Starlock range; low profile, light weight and with great postural support adaptations – the Airzone range just gets better; facing challenges in seating with client thermal stability – Omnitherm may be the answer, it can be integrated into all seating products on the market today! Stands 64 & 65 Mead Gallery.

Represented by Sarah Swann, Jenny Harding, Mitch Preedy and Jackie Thomas.

Independent Living Solutions Ltd

Stand: 43

2 Wilton Business Centre
Wilton
Salisbury
Wiltshire
SP2 0AH
United Kingdom

Tel: 01722742442
Web: http://www.indliv.co.uk/

Independent Living Solutions provide Case Management services for individuals with an extremely wide range of disabilities, across the whole of the UK. We also offer stand alone Occupational Therapy, Vocational Rehabilitation, and now have a team of Therapists who together with our engineering partner offer a posture and special seating service.

Invacare Ltd

Stands: 1, 2, 3, 4

South Road
Bridgend Industrial Estate
Bridgend
Mid Glamorgan
CF31 3PY
United Kingdom

Tel: 01656753262
Web: www.invacare.co.uk

Invacare is a leading manufacturer of mobility, seating and healthcare equipment. The company is committed to providing products that maximise comfort and independence and promote an active lifestyle. We are proud to introduce the new Spectra XTR powerchair that offers a new inter-changeable seating system, improved driving performance and simplified servicing. Please join us to review all the latest improvements to our extensive range of manual and powered wheelchairs. This year we are offering a chance to win a free all-inclusive delegate place to the European Seating Symposium to be held in Dublin during September. Please visit us at stand 1-4 to complete your application form, winner to be announced on Friday 17th April.

Invacare Ltd

Stands: 23, 23

South Road
Bridgend Industrial Estate
Bridgend
Mid Glamorgan
CF31 3PY
United Kingdom

Tel: 01656753262
Web: www.invacare.co.uk

Invacare is a leading manufacturer of mobility, seating and healthcare equipment. The company is committed to providing products that maximise comfort and independence and promote an active lifestyle. On display will be
a wide range of seating products that have been individually designed to promote good posture and provide exceptional comfort. Please join us to review all the latest products from our Specialist Rehab seating range.

This year we are offering a chance to win a free all-inclusive delegate place to the European Seating Symposium to be held in Dublin during September. Please visit us at stand 1-4 to complete your application form, winner to be announced on Friday 17th April.

International Seating & Mobility

Stands: 68, 69

Y Fron
Mayfield Place
Llantrisant
Pontyclun
CF72 8QG

Tel: 01865737290
Web: www.intsm.com

ISM is the UK supplier of the V-trak backrest system from PHP, which includes a new series of accessories. It is also the importer of the best selling active wheelchairs in Italy from Progeo Rehateam. The models range from paediatric through to active user, in both rigid and folding frames.

James Leckey Design

Stands: 12, 13

Kilwee Business Park
Dunmurry
Belfast
BT17 0HD

Tel: 02890602277
Web: www.leckey.com

James Leckey Design Ltd is the UK market leader and a global player in the manufacture and supply of supportive equipment for children with special needs. Leckey are committed to improving the lives of disabled children through well designed positional equipment. We are delighted to be exhibiting our Mygo & Squiggles range of seating systems, the seating systems will be displayed on various mobility bases to show their versatility. Please come visit our system where one of our Product Advisors will be delighted to give you a demonstration.

Karma Mobility

Stand: 60

Unit 6
Target Park
Shawbank Road
Redditch
B98 8YN

Tel: 08456303436
Web: www.karmamobility.co.uk

Lightweight wheelchairs. New folding tilt in space and updated full recliner.

Karomed

Stands: 75, 76

Millfield
Chard
Somerset
TA20 2BB

Tel: 0146066033
Web: www.karomed.com

Molten Rock Equipment Ltd

Stand: 67

Unit 2
Rook Tree Farm
Hulcote
Beds
MK178BW
United Kingdom

Tel: 01908586447
Web: www.moltenrock.co.uk

Molten Rock manufacture and retail the Boma off road wheelchair and its accessories. The Boma is in essence a mountain bike for wheelchair users; a purpose built lightweight off road mobility device for individuals with severe mobility impairments such as tetraplegia and paraplegia.

Newton Products Ltd

Stand: 17

71-75 Allcock Street
Deritend
Birmingham
West Midlands
B9 4DY
United Kingdom
Tel: 01217739111
Web: www.newtonproducts.co.uk

Manufacturers of the Vixen range of powered wheelchairs, and well known as being economical, practical and manoeuvrable. An added benefit is the ease of fitting special seating systems.

NuDrive Europe Ltd

Stand: 61

3-5 Rickmansworth Rd
Watford
Herts
WD18 0GX
United Kingdom

Tel: 08450542930
Web: www.nu-drive.com

Otto Bock Healthcare Plc

Stands: 58, 59

Otto Bock Healthcare Plc
32 Parsonage Road
Englefield Green
Egham
Surrey
TW20 0LD

Tel: 01784 744900
Fax: 01784 744901
Email: bockuk@ottobock.com
Web: www.ottobock.co.uk

Otto Bock Healthcare Plc are manufacturers of mobility products. Our expertise and technologies have set standards throughout an entire market sector because they are focused on a single purpose: to help people maintain and restore human independence. We manufacture paediatric buggies, manual wheelchairs, power chairs, walking frames and at our seating site we provide custom made seating units.

PDG: Product Design Group

Stands: 81, 82

Unit 102, 366 E Kent Ave. South
Vancouver
V5X 4N6
Canada
Tel: +16043239220
Web: www.pdgmobility.com

PDG manufactures manual tilt-in-space wheelchairs and bariatric wheelchairs designed to optimize function and independence.

PG Drives Technology Ltd

Stand: 41

PG Drives Technology Ltd
10 Airspeed Road
Christchurch
Dorset
BH23 4HD

Tel: 01425 271444
Fax: 01425 272655
Email: sales@pgdt.com
Web: www.pgdt.com

PG Drives Technology is the world's leading manufacturer of control systems for Wheelchairs & Mobility Scooters. PG has a modern design & manufacturing site in the UK, & a wide range of Sales, Service & Accredited Repair worldwide.

We are pleased to demonstrate the VR2 & R-Net control systems. Both systems represent excellent value for money. We have made significant advances in our drive algorithms, which deliver the best drive performance available on the market. Both systems have a wide range of serviceable parts including cables, joysticks & keypads. These components can be replaced by Approved Repairers offering quick turnaround on repairs and servicing. The VR2 is an advanced yet cost effective system, which can be built up using a range of modules. The basic system offers 50A drive control, whilst the most advanced system offers 90A drive control, 2 actuators, lights & attendant control. The VR2 can be programmed with up to 5 drive profiles, each specific to common driving environments.

At the opposite end of the spectrum is the R-Net system. The drive only system consists of a 2 module solution at a competitive price. R-Net delivers up to 120A per channel & can be easily expanded to accommodate up to 15 modules. It offers unparalleled flexibility in control of complex seating functions allowing control of up to 6 actuators in up to 12 different combinations of movement. The R-net has been designed such that it can recognise new functions and new modules automatically. As new modules are added into the R-net system they will “just work”. We call this future proofing, allowing the system to evolve as technology advances.

The R-Net specialty controls interface ‘Omni’ boasts two input ports, a range of colour displays, graphical and numerical speed indications and a clock. The Omni offers the ability to control the wheelchair with devices such as head arrays, mini joysticks and switch panels. Omni also offers IR control, and a new Bluetooth module allows you to drive the mouse on 4 different computers with your everyday driving device.

Represented by: Melanie Matthews, Sales Account Executive , John Hayward, European Major Account Manager, Shane Abbott, Customer Services Representative.

Pride Mobility Products Ltd

Stands: 77, 78

Pride Mobility Products Ltd
32 Wedgwood Road
Bicester
Oxfordshire
OX26 4UL

Tel: 01869324600
Web: www.pridemobility.com

Manufacturer & supplier of powered & non-powered disabled aids, including wheelchairs, scooters, and riser chairs.

Qbitus Products

Stands: 10, 11

Lightowler Road
Halifax
West Yorkshire
HX1 5ND
United Kingdom

Tel: 01422381188
Web: http://www.qbitus.co.uk/

Qbitus Products, manufacturers of quality pressure reducing seating and postural control devices. Supplying our standard cushion ranges of: Community, Mercury, Q-Care and Dynamic along side our established bespoke services.

R82 UK Ltd

Stand: 33

Unit D4a Coombswood Business Park East
Coombswood Way
Halesowen
W Midlands
B62 8BH
United Kingdom

Tel: 01215612222
Web: www.r82.com parent site
Web: www.r82-uk.co.uk UK link

R82 UK Ltd provides seating, wheelchairs, buggies and rehabilitation equipment for children and young adults. We are a subsidiary company of R82 A/s based in Denmark with sister companies based around the world. We are on contract with all of our wheelchair and special seating products in England and Wales with a proven track record of delivering quality, innovative products alongside service and solutions for children and young adults with disabilities.

Radcliffe Rehabilitation

Stands: 28, 29, 30

5 The Sidings
Top Station Road
Brackley
Northants
NN13 7UG
United Kingdom

Tel: 01280700256
Web: www.radclifferehab.co.uk

Radcliffe Rehabilitation Services has been established since 1993 supplying mobility and rehabilitation products to hospitals, wheelchair services and specialist centres throughout the UK. We are a contracted supplier to the NHS and have been an active member of the British Healthcare Trade Association for many years.
Our manufactured products include The SHADOW range of manual and power tilt in space wheelbases, which will accommodate many different seating systems. We are also the sole distributors for the NETTI wheelchair range including the NETTI III, NETTI 4U CE, NETTI 4U CED and NETTI MINI positioning wheelchairs. We also supply a range of PRESSURE RELIEF CUSHIONS.
We offer a no-obligation on-site ASSESSMENT SERVICE throughout the UK, whilst our AFTER CARE service includes REFURBISHMENT, MAINTENANCE & SERVICING.

Recticel Ltd

Stand: 38

STM Healthcare
Azalea Close
Clover Nook Industrial Park
Alfreton
Derbyshire
DE55 4QX

Tel: 01773 830426
Fax: 01773 830427
E-Mail: stmhealthcare@recticel.com
Web: www.stm-healthcare.co.uk

We are international manufacturers of renowned static pressure care products and solutions to healthcare markets worldwide. The ‘Classics' & 'Neo' cushion ranges promote effective pressure distribution whilst the ‘Salisbury’ range also encourages better postural management. Whether you need budget or bespoke products, we are confident that we have products to suit your needs. Listening to the demands of our customers, STM Healthcare has developed a NEW range of Bariatric cushions. These clinically evaluated pressure distribution cushions have been designed to provide greatly improved patient weight limits.

Represented by: Paul Howes, Graham Hockley, Andrew Squires, Stuart Henderson & Tammy Sharp

Remploy Healthcare

Stands: 54, 55

52 Holloway Field
Coventry
CV6 2DB
United Kingdom

Tel: 07977436408
Web: www.remployhealthcare.com

Remploy Healthcare are at the forefront of design and development and as such are the choice for healthcare products and services. We pride ourselves on our customer focus and after sales service. Winning the BHTA Mobility awards in 2006, 2007 & the BHTA Orthotic award in 2008, all 3 voted for by our customers. Our continuous programme of product development and marketing focus enables us to deliver innovative solutions to suit all of our customers' needs.

At Remploy Healthcare we offer the combined expertise of a large team of specialist staff, supported by experienced Sales and proactive Customer Care teams. Our catalogues are designed to bring about rapid solutions to customer need, delivering a vast range of products.

Remploy Healthcare are the largest supplier of manual wheelchairs to the NHS. With over 50 years expertise, our quality and service is renowned throughout the mobility market. We are constantly striving to bring innovative solutions to meet the demands of both prescriber and end user - our goal is to exceed the expectations of our customers from Commodity chairs, active user and modular solutions; through to the occasional user. PMG 2009 will showcase the launch of our new family of Lightweight Wheelchairs, the Dash Lite.

RMS Ltd

Stands: 19, 20, 21, 22

277 Medway House
Gillingham Road
Gillingham
Kent
ME7 4QX

Tel: 01634578881
Web: www.ineedawheelchair.co.uk

RMS are pleased to announce that for the fifth year running, our prices for belts, harnesses and anklesures have remained the same. We feel that in the current climate, our products are among the best value in the market place.
Look out for the Gill III system fitted onto a Clip base; also the new generation headrest mounting system, soon to be available.
Come and see us on Stands 19, 20, 21 and 22 to collect your free laptop bag and also your RMS poster to display at your Wheelchair Service.

Smirthwaite

Stand: 50

Smirthwaite
17 Wentworth Road
Heathfield
Newton Abbot, Devon
TQ12 6TL

Tel: 0162685552
Web: http://www.smirthwaite.co.uk/

Smirthwaite, a leading manufacturer of a wide range of equipment for children and young people with special needs are pleased to announce the launch of their exciting new postural correction chair – Strato.
Strato has been designed for 2 to 19 year olds who are able to get in and out of their chair independently but require minimum to moderate postural support when seated.
An ideal chair for the classroom or home, the Strato has a uniquely contoured forward tilting seat to encourage an anterior tilt of the pelvis for improved stability as well as trunk and lower limb alignment.
Also on demonstration will be the Samba, a fully supportive seating system with a unique mid line harness that stabilises and secures pelvic position and gives excellent trunk alignment. This eliminates the need for knee blocks and thoracic supports.
We look forward to welcoming you on stand 50.

Soft Options (Computer Systems) Ltd

Stand: 51

Amisfield House
Amisfield Road
Hipperholme
Halifax
West Yorkshire
HX3 8NE
United Kingdom

Tel: 01422204500
Web: www.softopts.co.uk

Software suppliers to the NHS covering Wheelchair Services, Orthotics, Prosthetics, Environmental Controls, Communication Aids, Community or Joint Equipment, Home Loans and Continence Services.

Specialised Orthotic Services Ltd

Stands: 25, 26, 27

Unit 127/128 Fauld Industrial Park
Fauld
Tutbury
Staffordshire
DE13 9HR

Tel: 01283520400
Web: www.specialisedorthoticservices.co.uk

Specialised Orthotic Services Ltd (SOS) have many years experience in the assessment and provision of Specialised Equipment to assist in the management of Disability.
With our expert Team of Clinical Managers, SOS provide a complete service for assessment and provision direct to the client with a comprehensive range of products and services aimed at solving problems related to Postural and Daily Management of the Disabled
With nearly 30 years experience in the field of paediatric & adult Special Seating SOS provides services to many wheelchair centres throughout the UK.
Please come and meet us on stand 25/26/27, alternatively check out our new web site at www.specialisedorthoticservices.co.uk

Sumed International (UK) Ltd

Stands: 44, 45

Sumed International (UK) Ltd
Integrity House
Units 1 and 2
Graphite Way
Hadfield
Derbyshire
SK13 1QH

Tel: 01457 890980
Fax: 01457 890990
Web: http://www.sumed.co.uk/

Sumed are delighted to be at PMG showcasing our extensive product range and sharing the opportunity to deliver outstanding client care. We are exclusive UK distributors for the full Roho shape fitting technology range, The Action range of viscoelastic polymer cushions and continuity of care products, Tempur Med viscoelastic cushions and Fortuna heavy duty wheelchairs which can accommodate weights of up to 50 stone. We are also delighted to be featuring X-Sensor pressure mapping technology which incorporates unbelievable "plug and play" simplicity with fantastic new advanced seating protocol software and high performance sensor mat options. In addition to these exciting products we have our ever popular Sumed flow form range of cushions and continuity of care products, and Viscotech viscoelastic and foam combination cushions. Come and visit us on stands 44 and 45 to meet the friendly knowledgeable Sumed team, discover the full Sumed portfolio and see live pressure mapping demonstrations throughout the show.

Sunrise Medical

Stands: 34, 35, 36, 37

High St
Wollaston
Stourbridge
West Midlands
DY10 2XD
United Kingdom

Tel: 01384446754
Web: www.sunrisemedical.com

Sunrise Medical are one of the leading providers of manual and powered wheelchairs and wheelchair seating to the NHS. A full range of products will be available to view on our stand.

Southwest Seating & Rehab Ltd

Stands: 15, 16

Fivehead
Taunton
Somerset
TA3 6PX
United Kingdom

Tel: 01460281871
Web: www.neowheelbase.com
Web: www.matrixseating-sws.co.uk

Southwest Seating & Rehab Ltd, as experts and manufacturers of the Matrix Seating System and the Neo Wheelbase, would be pleased to welcome you to our stand to discuss products and innovations developed from our hands on experience of the changing and challenging needs of special seating and mobility.

Tendercare Ltd

Stands: 31, 32

PO Box 3091
Littlehampton
West Sussex
BN16 2WF

Tel: 01903726161
Web: www.tendercareltd.com

The new, cost effective, highly versatile, unique Snappi range will be on show along ith the supportive Swifty Pushchair. We will be launching the newly updated and improved aluminium Mini Tilt Wheelbase and Modular Seating System, incorporating our new dynamic footrest. The innovative Thevo Twist Dynamic seating system will be shown for the first time.

Whizz-Kidz

Stand: 70

Elliot House
10-12 Allington Street
London SW1E 5EH

Tel: 0207 233 6600

Whizz-Kidz is a charity that is all about giving disabled children the chance to lead a more independent life. Our service meets their individual mobility needs and ensures they get the right mobility equipment, advice and training, at the right time. We are virtually 100% reliant on voluntary funds.

Z-Tec Mobility

Stand: 86

Unit 1b & 2b
Albion Works
Moor Street
Brierley Hill
West Midlands
DY5 3SZ
United Kingdom

Tel: 01384481111
Web: www.z-tec.co.uk

We have a wide product selection available: Transit Wheelchairs, Self-Propelled Wheelchairs, Rollators, Tri-Walkers, Canes, Bathing Products, Commodes, Mattress Protectors, Overbed Tables. Z-Tec is also the UK distributor for Topro - high quality products produced in Norway, Troja Rollator, Troja Forearm Walkers, Olympos Walkers, Taurus Walkers & Car Ramps.

PMG NTE 2009 Programme

Wednesday 15th April 2009			
14:00 - 20:00	**Registration**	*Rootes Reception*	
18:30 - 20:30	**Dinner for Weds B+B Residents Only**	Rootes Restaurant (ticket holders only)	
20:00 - 00:30	**Ice Breaker Event**	*Chancellor's Bar, Rootes Building*	Sponsored by Days Healthcare
Thursday 16th April 2009			
08:00 - 09:15	**Registration,**	*Rootes Building*	
09:30 - 09:45	**PMG Opening Address**	Arts Centre Theatre	Nigel Shapcott, PMG Chair
09:45 - 10:30	**PL1 - Opening Plenary Session,**	Arts Centre Theatre	Baroness Masham of Ilton
10:30 - 11:30	**Break and Exhibition**	Butterworth Hall & Mead Gallery	
11:30 - 12:45	**Free Papers and Research Projects**	Arts Centre Theatre	
	Postural management in mainstream primary schools - a pilot study of the views of teachers and assistants.		Eve Hutton
	Acquisition and Analysis of Customised Postural Support Systems		Lorna Tasker
	Factors affecting the use of night-time postural management equipment		Ginny Humphreys, Catherine Ward
	EPIOC Provision for People with Visual Impairments – A National Review of Eligibility Criteria		Lisa Douglas, James Hollington
	The Importance of the Use and Correct Positioning of Head-Restraints in Transport		John Tiernan
12.45 - 14:15	**Lunch / Exhibition**	Butterworth Hall & Mead Gallery	
	Poster presentations	Arts Centre Lower Foyer	
14.15 - 15:15	**Parallel Sessions**	**Arts Centre Complex**	
	PS1 - Pressure Care	Social Studies 21	Professor Dan Bader
	PS2 - Wheelchair Seated Passenger Transport - follow on from 2008.	Library 1	Bob Appleyard, Alison Johnston
	PS3 -Hitting the 18 week target	Social Studies 19	Peter Gage, Alex Winterbone
	PS4 - Development of the Rehabilitation Engineering Profession	Library 2	Simon Fielden
	PS5 - Is posterior tilt of the pelvis inevitable for many of those who are dependent on a wheelchair for mobility? Are we as providers of postural support compounding the problem?	Arts Centre Theatre	Dave Long and Pat Postill
	PS6 - State of the Science in Clinical Applications of Telerehabilitation	Social Studies 20	Mark Schmeler
15:15 - 16:00	**Break and Exhibition**	Butterworth Hall & Mead Gallery	
16:00 - 17:00	**Parallel Sessions Repeat**	*rooms as in previous session*	EXHIBITION CLOSED
17:00 - 18:00	**BREAK**	EXHIBITION CLOSED	EXHIBITION CLOSED
18:00 - 19:15	**Drinks Reception**	Butterworth Hall & Mead Gallery, Arts Centre	
19:30 - 01:00	**Gala Dinner**	Panorama Suite, Rootes Building	PARTY TIME!

Friday 17th April			
07:30 - 09:30	**Breakfast for Thurs Night B+B Residents Only**	*Rootes Restaurant*	
08:00 - 09:30	**Registration**	*Reception Rootes Building*	
08:00 - 09:40	**Special Interest Groups** (coffee available in lower foyer)	Arts Centre Theatre	
09:45 - 10:45	**Free Papers and Research Projects**	Arts Centre Theatre	
FP6	Wheelchair seating equipment for children: parents'/carers' views and experiences		Gillian Taylor
FP7	A Peer Review of the Provision of Powered Mobility Within the West Midlands.		Dr Panagamuwa Bandara
FP8	Clinical Findings from Rear Impact Investigations of a Wheelchair and Occupant		John Tiernan on behalf of Jennifer Walsh
FP9	Sitting Playfully: Does the use of a centre of gravity computer game controller influence the sitting and functional ability of children with neuromotor dysfunction?		Will Wade
10:45 - 11:45	**Break and Exhibition**	Butterworth Hall & Mead Gallery	
	Poster Presentations	Arts Centre Lower Foyer	
11:45 - 12:30	**Aldersea Lecture: "Doctor, Engineer or Architect"**	Arts Centre Theatre	Linda Marks, Consultant in Rehabilitation Medicine, Stanmore
12:30 - 13:15	**PMG Annual General Meeting**	Arts Centre Theatre	PMG Committee and Membership
13:15 - 14:30	**Lunch / Exhibition**	Butterworth Hall & Mead Gallery	
14:30 - 16:15	**PL2: Applying Evidence to Practice in Wheeled Mobility & Seating**	Arts Centre Theatre	Mark Schmeler, Department of Rehabilitation Science & Technology, University of Pittsburgh Julianna Arva, Manager Education & Sales in Europe, Tilite
16:15	**Prize Giving and Close**	Arts Centre Theatre	
16.30	**Refreshments**	Lower Foyer in the Arts Centre	

ABSTRACTS OF PRESENTATIONS

Thursday 16th April 2009

Opening
Plenary Presentation
PL1

Baroness Masham of Ilton

Thursday 16th April 2009

FREE PAPERS, FP1 – FP5

FREE PAPER 1

Postural Management in Mainstream Primary Schools – a pilot study of the views of teachers and assistants

Presenter: Dr Eve Hutton

Summary:
This paper presents the findings from a small pilot project, which was funded by Posture & Mobility Group in 2007/8. Based on interviews with teachers and teaching assistants (TAs) the paper explores their views and experiences of managing the postural needs of children with physical disabilities.

Aims and Objectives
Explore teachers' and TA's views of postural management (PM) for children with physical disabilities (PD) in mainstream primary schools.
Research Questions:
(RQ1) Explore the knowledge and understanding of teachers and TAs about postural management.
(RQ2) Identify barriers and facilitators to the delivery of postural management in schools.
(RQ3) investigate the types of support and information teachers and TAs require to support them in delivering postural management in schools.

Background:
A consensus statement has underlined the importance of a consistent and integrated 24 hour programme of PM for children with PD in order to limit health risks and promote the child's comfort and participation (Gericke 2006). A PM programme requires specialist equipment and daily exercises that are incorporated into the children's routine at home and school (Humphreys & Poutney 2006). Schools play an important part in delivering PM, yet the majority of teachers and TAs are inexperienced and untrained. Insufficient numbers of therapists remains a barrier to providing consistent support. Recommendations targeted at improving services for children with physical disabilities focus on the need to increase the knowledge and skills of all those working with disabled children and their families (Aiming High for Disabled Children 2007).

Methods:
A purposive sample of four primary schools in Kent was identified with assistance from the specialist teaching service and therapy managers in the area. Qualitative data gathered from individual and group interviews with 36 teachers and TAs was used to generate an explanatory framework around their experiences of managing postural care.
Findings:
Postural management is not a term widely used within schools. The majority of TAs thought it meant how you sit or stand: they did understand good posture, and observed when children were sitting uncomfortably and were insufficiently supported. TAs had been given instruction about how to carry out programmes but didn't understand the reasoning behind them. This resulted in rigid adherence to instructions. Teachers and TAs lack a framework to make sense of information and advice they receive from varied sources. Very few had personal experience of the longer-term benefits of PM, and therefore had nothing to compare with the perceived discomfort and restrictions the programmes imposed.

TAs described the emotional impact of the work, and felt anxious about causing the child discomfort. This is not an issue currently addressed within schools. Equipment was viewed as bulky, uncomfortable and restrictive. In some cases equipment had been provided without careful consideration of where or how it was to be used. There were many examples of where teachers and TAs had helped children who were reluctant to use equipment or engage in programmes. These individuals had made therapy sessions fun, involved other children and integrated therapy into the routine of the class. Other strategies involved allowing the child greater choice and control.

Most identified practical solutions when asked what they wanted. This included additional space, more TA support and space for children to have a ˜quiet area" for privacy and relaxation. Few teachers or TAs identified training although most wanted more advice and closer working relationships between health and education. Both teachers and TAs wanted planned regular visits from therapists. In some cases therapists were described as having good relationships with the school and providing excellent support and advice. In certain schools therapy visits were described as sporadic and teachers and TAs felt they were rushed and that they had insufficient time to ask questions.

Discussion

Acknowledging the limits of this small scale qualitative pilot study several key findings have emerged. These have led to the development of recommendations intended to bring about positive change in how postural management programmes for children with disabilities are implemented and supported in schools. Principle amongst these is the need to develop a postural awareness information pack for schools. This would enable schools to develop greater awareness of the importance of good posture for all children across a wide spectrum, thus engaging all school staff in issues which currently are largely the responsibility of untrained teaching assistants. The information pack would address the individual needs of those working with children with more complex needs. The research has provided greater insight into the experiences of teachers and TAs, highlighting the emotional impact of this work. The study has also highlighted the dependence of schools for support from overstretched therapy services and the urgent need to address gaps in service if schools are to be adequately supported in this important role. In talking with teachers and TAs it became apparent that the children's own views on postural management were missing. We currently lack insight and understanding of the child's perspective. Further research should be commissioned in order to explore their views and ensure future initiatives are child-centred.

References

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FREE PAPER 2

Acquisition and Analysis of Customised Postural Support Systems

Presenter: Lorna Tasker

Summary
This project has developed shape acquisition and analysis processes to scientifically advance the knowledge of individuals' shapes with complex disabilities. The processes have employed 3D laser scanning technologies. Shape analysis processes were devised and investigated by representing the customised postural shapes as geometric shapes.

Aims and Objectives
The primary objective of this study was to develop a technique for 3D shape data collection and analysis of custom seating systems. A secondary objective of the project is to determine the required accuracy for research purposes and CAD/CAM manufacturing of seating systems by comparing two laser scanning systems. The research question is –
Can 50% of the customised systems be represented by geometric shapes within ±10mm from the actual shape?

Background
In the specialist field of wheelchair seating there is insufficient knowledge or scientific evaluation of customised postural support shapes. The ability to classify or identify generic shapes from the captured contours will allow advancements in the field and in particular influence the future fabrication of these seating systems. At present, most customised seating systems are expensive; are labour-intensive; can require highly skilled professionals and are not reproducible. The predominant methodology employs a plaster casting technique and as a result, shape information is often retained in the plaster cast, therefore has not been measured and may well not be recoverable over time due to storage issues; therefore no comparable measurement or outcome data is available. This hinders any scientific evaluation from taking place.

Methodology and Results
This project employed two 3D laser acquisition systems to scan a sample of 25 customised plaster casts sourced from three Special Seating Centres. The Faro ScanArm (FARO Technologies Inc., Florida, USA), a high-cost laser scanner, was used which is a seven-axis articulated non-contact measurement device (accuracy of ±61µm). The Microscribe G2LX/Microscan (Immersion Corp., San Jose, CA, USA) is the low-cost in-house scanner (accuracy ±100µm) at Swansea which is used routinely for clinical work as part of the Digital Seating Service. The scans from the Faro scanner and Microscan were compared for 10 shapes. Using Geomagic Qualify (Geomagic Inc., CA), the 3D shape information was overlaid and compared to produce 3D deviation results. The results between the laser scanners revealed very good agreement. Typical deviation results were 78.6% of comparison points were within a ±0.5mm tolerance and 94.9% of points within ±1.0mm.

Shape analysis was performed by obtaining global dimensions (such as volume of the shapes from the bounding box sizes) which may advance the manufacturing of standard mounting systems. Further detailed analysis was performed by deriving shape functions (or shape frequency tables) for each shape which provides information about the representation of these shapes as geometric column rods for different grid cell sizes. The Shape Frequency Tables were used to produce histograms to act as shape descriptors, which were used as part of exploratory data analysis to allow comparisons to be made. The shape analysis process developed in this project provides a potential low-cost fabrication method. The proportion of bases and backs which can be manufactured using the proposed geometric representations (where column heights are rounded to the nearest 10mm) was defined as part of the analysis. In order to demonstrate this potential low-cost manufacturing technique for customised seating systems, models were manufactured using dowel rods to represent foam column rods.

To increase the accuracy of the geometric representations, statistical measures were investigated, where the standard deviation values for each grid cell size highlighted areas where the geometric representations exceeded the ±10mm tolerance. This typically occurs in steep

areas of the shape where the range of heights for the raw points was large. To address this, the standard deviation and coefficient of variation was used to highlight these areas.

Discussion
It was considered that the 3D comparison results confirmed the use of the lower cost scanner for both research purposes and clinical work utilising CAD/CAM techniques. This validation was made on the basis that the data is superior to that available from most shape collection devices used clinically and, from clinical experience, is considerably greater than previous/existing tolerances. The 3D comparison results also provide an interesting insight into the different plaster cast manufacturing techniques used by the three special seating centres, where the shell-type cast is more prone to damage. These results further support the use of scanning technologies for the recording of shape data as detailed information can be retained in a digital file for possible future reproductions and alterations.

The geometric shape representation results clearly indicate that the range of back shapes is more diverse when compared to the bases. This confirms the clinical knowledge that the range of upper body skeletal deformities can be more diverse and require more support than pelvic shapes, where back postural systems are often supporting the client against the effect of gravity and lateral supports are often deeper to compensate for this.

With these results, manufacturers of customised seating systems may choose to fabricate a defined proportion of customised seating systems using the proposed geometric representations which would be a low-cost technique. For the remaining proportion of shapes, external CNC technologies could be sourced.

It is hoped that these promising results will form the foundation of a larger study with larger sample sizes.

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FREE PAPER 3

Factors affecting the use of night-time postural management equipment

Presenter: Ginny Humphreys, Professional Doctorate student, University of Brighton
Additional Presenter: Catherine Ward, Specialist Speech and Language Therapist

Summary
This study explores the factors that affect the use of night time positioning equipment. Children, their parents and therapists are interviewed. Early results show that children have insights into their experiences from as young as 3 years and that bedtime behaviour is an important aspect for prescribing therapists to consider.

Aims and Objectives
1. To understand the factors that influence a child's use of a sleep system at night.
2. To explore the part therapists play in the child and family's experience of using a sleep system.
3. To explore whether sleeping in a sleep system affects the quality of sleep in terms of hours slept and number of awakenings.

Background
It is recommended that children with bilateral CP in GMFCS levels IV and V should start 24-hour postural management programmes in lying as soon as appropriate after birth (Gericke 2006).

However children with CP have a higher incidence of sleep problems than children with no chronic health conditions (Newman et al 2006). Thus introducing a sleep system into a family setting and expecting the child to settle into it happily and sleep through the night is perhaps optimism in some cases.

There are no studies as yet asking the children for their views on what it is like to sleep in a sleep system. In fact there is a paucity of studies in which children are asked for their views on therapy intervention. However, the UN Convention on the Rights of the Child ratified by the UK Government in 1991, Article 12, assures the rights of the child to express an opinion and to have that opinion taken into account in any matter concerning them (Ward 1997). Article 13 states that appropriate means of communication must be provided for children (Rabiee et al.2005). Children with communication and or cognitive difficulties do require different approaches and research tools to find out what they think and, unless they are the focus of the research, they will inevitably be excluded (Morris 2003).

Methods

In this study children with CP between the ages of 3 and 9 years, at the point of being prescribed a sleep system for the first time, were interviewed as were their therapists and parents. Children between the ages of 18 months and 3 years were included but not interviewed. Participants were interviewed before having the sleep system and again several months after introduction of the sleep system. The parents also kept a 10 day sleep diary before and after intervention. The children were interviewed by a speech therapist using the Talking Mat method.

Results

The data was analysed using the Framework Analysis method. Initial results suggest that the family bedtime routine and good sleeping habits play a major part in determining whether families find they can use sleep systems at night. Research suggests that up to 82% of parents with children with disabilities report sleep difficulties (Cowdell and Parrott, 2007). The National Service Framework mentions sleep problems in children with disabilities and that only a minority of families get help.

Children with little or no verbal communication are able to report their views if the techniques used to interview them are appropriate and the interviewer is skilled. Some of the children interviewed before having a sleep system reported pain at night.

Discussion

The results of a pilot study that practised interviewing techniques with a child with CP and her mother raised concerns about families not receiving appropriate advice and support to help improve sleep difficulties. This child had been prescribed a sleep system at the age of 11 months to help with discomfort at night. It was not effective. A health visitor tried a 6 week sleep behaviour modification programme when the child was 2 years. That did not work. The child was started on melatonin at age 8 years and the family began to have some consistent support in adapting learned sleep behaviour. It is reasonable to assume that lack of trained help is a common experience for families locally. It would appear that there is a need for a tool with which clinicians can take an in-depth sleep history e.g. the Chailey Sleep Questionnaire (Khan, Y. and J. Underhill 2006) and identify the problems accurately. A structured local sleep intervention service would ensure that families receive help in a timely way.

Asking the children what they think about going to bed, why they wake up at night and what they feel like in the morning has been an interesting experience. The technique is important and having a speech therapist on the research team with expertise in using the Talking Mat method has been invaluable. Children as young as 3 years who have little or no verbal communication are able to offer insights into their experience of bedtimes, sleeping and using sleep systems.

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FREE PAPER 4

EPIOC Provision for People with Visual Impairments: A National Review of Eligibility Criteria

Presenters: James Hollington and Lisa Douglas
Additional author: Lucy Austin

Summary
A national review of eligibility criteria for EPIOC provision for people with visual impairments showed huge differences in provision criteria across the country. This presentation will feedback results, share strategies used to reduce risk and aims to encourage equitability and national alignment.

Aims and Objectives
This project came out of an exploration of how other services provided EPIOCs for people with visual impairments in order to assist the Sussex Rehabilitation Centre (Brighton) in their provision. Many of the services requested feedback from our findings.

Aims and objectives
- encourage services to review their eligibility criteria
- encourage equitability for people with visual impairments
- encourage national alignment
- assist with strategies for reducing risk

Background

Technique
159 wheelchair services were written to asking for ‘a brief outline of how your service deals with EPIOC referrals for service users with visual impairments, or registered as partially sighted or blind’. There was a 32% response rate (52 services replied).

Standards
There is no legal eyesight requirement for users driving Class 2 or 3 vehicles. A guideline given by the DVLA recommends that a user should be able to read a car’s registration number from a distance of 12.3m (40ft) and that a user should regularly monitor their visual ability. The visual requirements for driving a car or motorcycle are often misapplied to powered wheelchair users. These requirements are that a driver must be able to read a car registration plate from 20m (post 2001 plates) and have a minimum field of vision of 120degrees in the horizontal and 20degrees in the vertical plane.
To be registered as severely blind, a person’s sight has to fall into one of the following categories:
- visual acuity of less than 3 / 60 with a full visual field

- visual acuity between 3 / 60 and 6 / 60 with a severe reduction of field of vision, such as tunnel vision
- visual acuity of 6 / 60 or above but with a much reduced field of vision, especially if a lot of sight is missing in the lower part of the field.

To be registered as partially sighted a person's sight has to fall into one of the following categories:

- visual acuity of 3 / 60 to 6 / 60 with full field of vision
- visual acuity of up to 6 / 24 with a moderate reduction of field of vision or with a central part of vision that is cloudy or blurry
- visual acuity of up to 6 / 18 if a large part of your field of vision, for example a whole half of your vision, is missing or a lot of your peripheral vision is missing.

Results

Of the services that responded 44% said that a user would be considered eligible for EPIOC provision as long as they could compensate for their visual impairment either independently or with support. 54% of services said that a service user would not be considered eligible for EPIOC provision unless they could achieve a specified level of visual ability in an eye examination. 2% said that a service user would not be considered eligible for EPIOC provision if the service user was registered blind but if they were registered partially sighted or have a lesser visual impairment the service user would be practically tested to see if they could compensate.

54% of services said that a service user would not be considered eligible for EPIOC provision unless they could achieve a specified level of visual ability. These services tested people's visual ability to various different degrees. 21% used the DVLA recommendation of a service user being able to read a number plate from 12.3m (40ft) and had this equated to achieving a Snellen score of 6/24. 11% used the DVLA requirements for a car driver of being able to read a number plate from 20.5m. 11% stated that potential users must no be registered blind or partially sighted. 21% stated that potential EPIOC users had to have a specific visual ability but were unspecific on the tests applied. Between the remaining 10 services 7 different requirements were applied.

Discussion

This study highlights big discrepancies in eligibility criteria across the country. It could also be argued that service users with visual impairments are not being treated equitably as they sometimes have to meet visual requirements far beyond the recommended guideline set out by the DVLA and Department of Transport in order to be eligible for the provision of an EPIOC! It is felt that even if the recommended guidelines are not met by a service user they should still be given the opportunity to show whether they would be able to safely compensate.

Services that assessed people on an individual basis to see if they could practically compensate also gave feedback on strategies they adopted in order to reduce risk and ensure safe provision. These strategies will be discussed in the presentation.

This study particularly highlights the value of professionals sharing what we know and do and feeds into the importance of establishing Special Interest Groups (SIGs) within PMG. This is the sort of information sharing that it is hoped will be established in one area of the Service Delivery SIG in order that services can align nationally and support each other.

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FREE PAPER 5

The Importance of the Use and Correct Positioning of Head-Restraints in Transport

Presenter: Mr John Tiernan

Additional Authors:
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Summary
Head-restraints have been shown in the automotive industry to protect against whiplash injury. This paper extends this knowledge to occupied wheelchairs transported in vehicles. Our tests have shown the benefit of using a head-restraint in transport, and the importance of the positioning of the restraint is also considered.

Aims and Objectives
Low velocity rear impact accounts for 30% of automotive injuries [1]. This study investigates the effectiveness of head-restraints on occupied wheelchairs and the influence of the initial head/head-restraint gap on neck injury outcome. Three test configurations were considered; a wheelchair with:

1. No head-restraint
2. Prototype head-restraint
3. Commercially available *Rolko* head-restraint.

The importance of positioning was also considered in order to inform improved head-restraint design and usage.

Background
The absence of a head-restraint significantly increases the risk of whiplash injuries to the neck for conventional motor vehicle seat occupants in a rear impact [2], but there is no accident data demonstrating that this is also true for adult wheelchair occupants.

Sled tests without a head-restraint were performed to provide baseline neck injury prediction data for adult occupants of rigid wheelchairs without a head-restraint seated in vehicles subjected to a

rear impact acceleration pulse. The 50%ile male *BIORID II* rear impact dummy was used as it is validated for rear impact in the ΔV range of 7-15 km/h [3] and is recommended for whiplash injury evaluation [4]. The dummy was seated in a rigid wheelchair similar to the SAE J2252 surrogate [5]. The wheelchair seat and back support were plywood with 2.5cm thick *PlastazoteTM* polyethylene foam padding used on the back support. The IIWPG 16km/h 10g rear impact pulse was used as this has been reported to represent the whiplash scenario [4]. An *Unwins* karabiner type anchorage and webbing tiedown (SWR/10) and three point occupant belt system were utilised. Further details of the test setup are available in [6, 7].

The tests were repeated using a prototype head-restraint, as well as a commercially available head-restraint (*Rolko*). For the latter, a test was performed with no initial gap between the head and head-restraint and one with a 50mm initial horizontal gap between the head and head-restraint.

Whiplash type injuries are classified as *AIS1*, and they occur due to indirect loading of the neck. Injury criteria relate parameters measured on physical dummies to real injuries. However, the injury mechanisms for whiplash are not fully understood [8], and the choice of injury criteria is therefore difficult. Nonetheless, the *NIC* and *Nkm* criteria which quantify the retraction phase and maximum bending phases of whiplash respectively have been shown to correlate well to injuries in real-world accident reconstructions [9], and these criteria were evaluated in the tests.

The tests with no head-restraint showed hyper-extension of the neck due to differential loading of the head and torso.

The peak *NIC* scores for these tests ranged from 34 to 37. This is associated with a greater than 90% risk of neck injury symptoms persisting for longer than one month. Similarly, the peak *Nkm* score showed greater than 45% risk of similar symptoms. For tests with a head-restraint with no initial gap between the head and head restraint cushion, hyper-extension of the neck was prevented. For these tests the probability of neck injuries with symptoms lasting greater than one month is reduced to about 20-30% using the *NIC* criterion and to less than 5% using the *Nkm* criterion. However, comparing the *Rolko* test with no gap to the 50mm gap showed a dramatic increase in the risk of neck injury predicted using the *NIC* criterion. In contrast, the influence of the gap on the *Nkm* score is much less dramatic as this mainly assesses neck hyperextension, which does not occur with or without the 50mm gap.

Discussion

Research on car occupants shows that a head-restraint should be placed as close to the head as possible [10]. Tests on volunteers seated in car seats have shown that the *NIC* score is correlated with the head/head-restraint gap [11]. For wheelchair occupants, our research, using the *BIORID II* rear impact crash dummy seated in a rigid wheelchair with the *Rolko* head-restraint subjected to a 16 km/h rear impact crash pulse, indicates that the initial gap between the head and a head-restraint is also significant for a wheelchair occupant. Although only nine tests were performed in total, and only a single test was used to evaluate the influence of the head/head-restraint gap, the findings strongly indicate that the use of a head-restraint on an occupied wheelchair will significantly reduce the likelihood of whiplash injury in the event of being involved in a rear impact vehicle collision while being transported [6, 7]. It is therefore a recommendation of this work that head-restraints ought to be fitted as a matter of course to any occupied wheelchairs that are intended to be transported in a vehicle. Furthermore, it appears to be critically important that, where a head-restraint is used on a wheelchair, it should be positioned as close as possible to the back of the head of the wheelchair occupant. Should this be a source of discomfort, self-consciousness and/or limited vision to the user, the head-restraint should be removed when the user is not on transport.

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Thursday, 16th April 2009

Parallel Sessions: PS1 – PS6

Parallel Session 1

Pressure Care

Presenter: Dan Bader

The presentation will apply some of the evidence of the importance of pressure-related issues at the patient-support interface to inform clinical practice. Accordingly, the following issues will be discussed:-

The external mechanical forces that occur at the skin surface of a loaded interface, namely pressure, shear and friction, will be highlighted.

The associations between mechanical and physicochemical factors, e.g. temperature humidity, that occur at the skin surface of a loaded interface and how these can be influenced by material properties and seating configurations.

Description of the transfer of external forces into the internal environment of the soft tissues - what are the internal features which determine pressure-induced damage?

A critical appraisal of the use of pressure measurements at the interface –
- how is the data best interpreted?
- how reliable are the data?
- how can the data be used effectively by the clinical support team?

Identifying characteristics of patients at risk of pressure-induced damage.
The protection of soft tissues from pressure induced-damage.
The translation of knowledge related to pressure ulcer development into clinical practice.

Useful References

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Parallel Session 2

Risk Considerations for the Transport of Wheelchair Seated Passengers in Motor Vehicles (Part 2)

Presenters: Bob Appleyard & Alison Johnston

During our presentation last year it was shown how risk control measures adopted by the automotive industry influenced the development of standards for wheelchair seated passenger safety in motor vehicles. It was shown that because of very important differences in both hardware and, more importantly, the passenger, this was not always appropriate. The results of an audit carried out on SEN transport at a special school concluded that "real life" can be very different.

In this year's presentation we hope to build on last year's work. To discuss what has been happening at International, National and Local level; and present further information on the proposed UK "Travel Passport Scheme"; details of the risk orientated draft standard 'Wheelchairs for Use in Transport' proposed as a European CEN document and how local practice is being influenced and developed.

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Parallel Session 3

Beating the 18 week deadline

Presenters: Peter Gage and Alex Winterbone

This workshop will explore the issues around the 18-week target from the Wheelchair Service viewpoint.

- Where did it come from?
- What is a Clock start, Clock pause, Clock stop and when do they happen?
- Monitoring and tracking. How do you keep on top of the process? Spreadsheets? Double entry?
- What are the problem areas meeting the target? - Assessment capacity, Funding for equipment.
- Process mapping.
- Action plans.
- Tracking old information through existing systems.

- Data collection & data reporting in a sustainable way.
- Quick fixes versus long term sustainability.

The participatory workshop will draw on everyone's experiences for the benefit of all.

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Parallel Session 4

Development of the Rehabilitation Engineering Profession

Presenter: Simon Fielden

Summary
This interactive session will provide an overview of the Rehabilitation Engineering (RE) profession, current initiatives to modernise the profession and attendees will have the opportunity to discuss and debate meeting the challenges facing the profession.

Aims and Objectives
To provider a summary of the direction of travel for health and social care service provision in the 21st Century
To provide a summary of the current status of the RE profession in England
To understand the role of the RE profession in the context of the assistive technology sector
To review the current status of regulation of the RE profession in England
To provide an overview of current education and training opportunities for the profession
To review the professional support offered to the profession
Tools to refine RE Services skill mix
To review the Modernising Scientific Careers initiative
To review challenges the profession faces in moving forward

Background
The RE profession has been moving towards improved regulation over a number of years. Challenges to this process include the small and disparate nature of the profession, lack of understanding of the profession and a reluctance to adopt more efficient service delivery models.

The Government now acknowledges that the current model for health service provision in the UK is unsustainable due to demographic changes, technological advances and the drive to improve patient quality. New models of healthcare delivery will be based around personalised healthcare, healthy lifestyles and quality improvements, a key driver being to deliver more care closer to home. These changes represent excellent opportunities for the RE profession to develop and

expand into service provision areas such a telecare, telehealth and smart home technology. This session will explore some of the barriers and drivers to develop a profession fit for the 21st Century.

Attendees are asked to consider the following issues prior to attendance at this session:-

What are current RE staff's views of the Assistant RE Practitioner role?
Are current and proposed recruitment channels into the RE profession adequate?
Is adequate professional support provided to RE staff?
What are the unmet training needs of the RE profession?

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Parallel Session 5

Is posterior tilt of the pelvis inevitable for many of those who are dependent on a wheelchair for mobility? Are we as providers of postural support compounding the problem?

Presenters: Pat Postill, David Long

Summary
People who are wheelchair dependent commonly present to clinicians with problems associated with a posteriorly tilted pelvis. Solutions for this are many and have variable success. The presentation will propose a potentially controversial solution which has been shown to be clinically beneficial.

Aims and Objectives
1) Raise awareness:
- that usual prescription for seat shape (ramped) is likely to, in some cases, encourage posterior tilt of the pelvis rather than aid a stable posture.
- of why a posterior tilt is potentially destructive and dysfunctional.
- of postural limitations that need to be accommodated to reduce the tendency for the pelvis to posteriorly tilt.

2) Demonstrate, through clinical experience, solutions to these problems.

Background
Seating commonly has contours to accommodate buttock shape in conjunction with a raised front section to allow for the fact that there is greater tissue mass under the buttocks than under the thighs. Indeed, if a person had the tendency to slide forward in the seat because they have a posteriorly tilted pelvis, there may be a tendency to ramp the cushion to keep the person in place. This is likely to reduce the risk of sliding forward but it will be at the expense of achieving a neutral, or at least a less, posteriorly tilted pelvis.

In terms of posture management, a posteriorly tilted pelvis raises concerns because it inevitably leads to a flattened lumbar curve at best, with a corresponding kyphotic thoracic spine which gives rise to an extended neck position and chin poke. Secondary complications are a reduction in lung capacity and a neck posture from which it is difficult to maintain head balance, which in

turn has implications for swallow and communication. In conclusion, this is a non functional, destructive and tiring posture for the person.

Case studies will be used to illustrate solutions found to address this difficult problem. As always, the solutions suggested will not be appropriate for every individual and a thorough assessment is essential to aid prescription.

It is anticipated that the case presentations will stimulate discussion and debate.

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Parallel Session 6

State of the Science in Clinical Applications of Telerehabilitation

Presenter: Mark Schmeler

Additional Authors: Richard M. Schein, Michael McCue & Kendra Betz

Rehabilitation service providers in rural or underserved areas are often challenged in meeting the needs of their complex clients due to limited resources in rural or under-served areas. Recruitment and retention of the rural clinical workforce are beset by the ongoing problems associated with limited continuing education opportunities, professional isolation, and the challenges inherent to coordinating rural community healthcare.

People with disabilities who live in rural or under-served communities also face challenges accessing healthcare. Travelling long distances to a specialty clinic for necessary expertise is troublesome due to inadequate or unavailable transportation, disability specific limitations, and financial limitations. Distance and lack of access are just two threats to quality of care that are now being addressed by the use of videoconferencing, information exchange, and other telecommunication technologies that facilitate telerehabilitation.

This session discusses and summarizes clinical and vocational rehabilitation applications of telerehabilitation. Definitions related to the fields of telemedicine, telehealth, and telerehabilitation, and considerations for the impetus of telerehabilitation will be presented. A review of the telerehabilitation literature for assistive technology applications; pressure ulcer prevention; virtual reality applications; speech-language pathology applications; seating and wheeled mobility applications; vocational rehabilitation applications; and cost-effectiveness will also be reviewed. Discussion regarding external telerehabilitation influencers, such as the positions of professional organizations will further be presented. Finally, a summary of the clinical and research findings a recently completed study related to remote wheelchair prescription will be presented.

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Friday 17th April 2009

FREE PAPERS: FP6 – FP9

FREE PAPER 6

Wheelchair seating equipment for children: parents'/carers' views & experiences

Presenter: Gillian Taylor

Additional Authors: Dr David Porter, Reader, School of Health and Social Care, Oxford Brookes University

Summary
This qualitative study explored what makes children's wheelchair seating equipment more or less useable within day-to-day family life. Face-to-face interviews were carried out with 10 people/couples who were the main carers of children (aged 2 - 12 years) who used wheelchair seating equipment for mobility and postural control.

Aims and Objectives
The aim of the study was to provide an opportunity for parents/carers to freely reflect and report on their experiences of using wheelchair seating equipment with their children. It is hoped that the results will inform professionals working within services that provide wheelchair seating equipment to families and also those who design, manufacture and sell it.

Background
In this study, the term 'wheelchair seating equipment' refers to wheelchairs that provide a greater degree of postural support than standard wheelchairs. This may include a firm shaped seat or back, pelvic support, thoracic support, knee block, pommel or head support. There are a large number of children in the UK who have been provided with such equipment and the provision of the equipment is costly to the NHS (1).
An important consideration is whether the equipment is actually used by families. Clinical experience has suggested that this may not always be the case. This observation is supported by several studies that indicate that assistive technology, including wheelchair equipment, often does not get used by the people for whom it is provided (2&3). Three authors (4,5&6) reviewed the literature and documented some possible reasons for this. However, these studies have mainly concentrated on the adult population and have included a wide range of equipment.
Some studies (7,8,9 &10) have looked at children's seating equipment and, although the views of parents/carers have comprised an element of the studies, none have sought the experiences and views of parents/carers in depth as the main focus. These studies have identified that there is often a difference between the opinions of the parents/carers and the therapists on what aspects of the equipment are important. Service providers often do seek feedback from parents, but constraints of time and the parent/therapist relationship may limit the depth of information that can be obtained.

Design and Methodology
This exploratory study used face-to-face unstructured interviews as its data collection method. Participants were the parents or primary carers of children (aged 2 – 12 years) using manual wheelchair seating equipment for mobility and postural control (at least pelvic and thoracic support). Recruitment was via special schools within Oxfordshire, Gloucestershire, Warwickshire and Northamptonshire.
Participants were invited to talk freely about using their child's wheelchair equipment within their everyday routines. If prompts were necessary, they took the form of asking the participants about using the equipment within everyday scenarios (e.g. a typical school day, an outing in a vehicle,

shopping, family holiday, etc). The interviews were audio recorded, transcribed verbatim and analyzed thematically.

Results

Analysis is underway and will be completed by February 2009.
The main themes emerging from the data so far are regarding:

- Equipment characteristics (weight, aesthetics, size, adjustability, foldability, protection of child from the weather, robustness, wheels, suspension)
- Physical welfare (of child, of carer)
- Psychological issues (perception of others, participants' attitude, emotions)
- Lifestyle (living accommodation, family activities, quality of life, finance)
- Wheelchair services (provision of equipment, maintenance of equipment)

These themes will be described and discussed more fully during the presentation.

Discussion

Participants were keen to offer their opinions about their children's equipment and to talk about their experiences of using it. All participants highly valued the equipment that had been provided for their children and viewed it as essential within their daily lives. Participants were largely prepared to use the equipment, despite there being difficulties in doing so. There was little evidence of the equipment not being used.
Participants made many references to the physical characteristics of the wheelchair equipment and offered ideas for improvement. However, the results show that there are many other factors regarding the use of children's wheelchair seating equipment that are of great importance to families and that affect how useable they are within everyday routines and activities.

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FREE PAPER 7

A Peer Review of the Provision of Powered Mobility Within the West Midlands

Presenter: Dr Bandara Panagamuwa

Author: Rachael King
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Summary
A peer review of powered mobility involving West Midlands posture and mobility and district wheelchair services revealed;

- For complexities e.g. MS, MND the actual practice was uniform and similar to the desirable best.
- Wide variation in basic provision as well in actual practice and what was considered ideal.

Aims and Objectives
To:

- Appraise and debate the current practice regarding provision of powered mobility in the West Midlands.
- Include users and managers in the analysis and discussion of the pathways and procedures used by the Posture Mobility Team and the Local Wheelchair Services.
- Formulate a common strategy that would improve the provision of powered mobility in the region and reduce a perceived postcode lottery regarding provision of powered wheelchairs.

Background
User views and Experiences of Using and Provision of Powered Mobility
Two users gave detail outlines of their powered mobility provision. Both felt that powered mobility gave them a freedom they did not have previously. Both stated that there was no where to hang their shopping!! highlighting how important it is to look at someone's life style when providing powered mobility.

Clinical Assessment both Medical and Practical
A series of case studies was presented to illustrate when powered mobility should be provided and to highlight that a multi-disciplinary team is the best way to assess someone for powered mobility. The case studies allowed discussion around clinical reasoning and the assessment process for example when supplying to children.

Group work and discussions based on scenarios needing powered wheelchairs
Four groups of 5-6 clinicians an hour to discuss 4 different scenarios, answering the questions:

- Would you provide in this situation and if so what would you provide using your current criteria/when not restricted by criteria?

Scenario one was a young boy with CP who was able to walk short distances at home but required a powered chair for school. This scenario highlighted that some wheelchair services would not provide but expect education to supply, some would joint fund with education and others would be happy to supply. In the ideal world all wanted to provide powered mobility for home and school but are currently restricted by criteria.
Scenario two was a gentleman with MND living in an unadapted property with this wife. In this situation all wheelchair services agreed that they would provide a TIS Comfort EPIOC, fast track the client and make sure the EPIOC had a control system that can be specialised in the future. They would also contact social services to check that access/ramps etc were being looked into. Refer to ACT if necessary. There were concerns however that ACT cannot assess quickly enough; it was stated that key workers are not present in every district. All agreed they would not do anything differently with or without criteria.
Scenario three was a lady with MS with slight visual impairment. All decided to supply Powered TIS, attendant control (when required by the user), seating and controls that could be adapted in the future. Again criteria did not seem to change what people felt they should do.

Scenario four a young man who required a powered chair for playing hockey. All agreed that they would supply an EPIOC with special seating and controls for day to day use but would not provide a chair from which sport could be played. Some suggested they may fund a voucher for a chair that could be used for both. Most suggested that a separate sports chair be funded separately. Without the criteria most said they would like to provide either a chair suitable for sport or 2 separate chairs.

Discussion
The Effective Mobility Course gave a platform for the delegates to explore the concepts of powered assessment and provision.
The feed back from the group scenarios were varied when looking at the more basic provision especially when looking at what would be provided with current criteria; the differences disappeared when looking at the same situation without applying criteria. However in the more complex situations provision was the same between the groups with or without the current criteria. This showed that across the region most clinicians felt the same about the provision of powered mobility but criteria leads to different or no equipment being supplied in the less complex cases. The biggest difference was whether or not training was provided for the EPIOC tests and whether clients would first need to be an EPIC user for 3/6 months before the test could be completed. It was felt that this should not be the case unless a client appeared unsafe inside.
This day highlighted that current criteria can restrict provision of powered mobility even when it is considered to be clinically necessary especially into schools, nursing homes or when someone has limited walking ability indoors.

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FREE PAPER 8

Clinical Findings from Rear Impact Investigations of a Wheelchair and Occupant

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Summary
Clinical findings of rear impacts on an occupant and wheelchair during surface transport, including the effect of scoliosis and adapting the wheelchair to the occupant, are presented. A scoliotic occupant was found to be at greater risk of injury; however a custom contoured seat was found to reduce this risk.

Aims and Objectives
This work aims to determine the best methods to protect a wheelchair occupant in the event of a rear impact. To do this the computational model of a wheelchair and occupant in a rear impact

had to be adapted to be more realistic. The effect of scoliosis in a rear impact was determined using these models. The effect of adapting the wheelchair to the occupant was also investigated.

Background

Rear impact analysis of wheelchairs and occupants during surface transport has largely been neglected, whereas frontal impact has been more extensively investigated. The occupant used for impact analysis is generally a 50th percentile crash test dummy. This is not representative of many wheelchair users. The surrogate wheelchair that is used for this type of research is also not representative of a wheelchair that is adapted for an occupant with a postural deformity. Therefore these areas were investigated for this work.

To conduct this analysis a combined sled testing and numerical modelling approach has been adopted. A computational model of an occupant in a wheelchair subject to a rear impact has been developed and validated, based on output data from the experimental work. In the rear impact sled test high levels of neck injury were predicted as the test was conducted without a headrest. The head and neck therefore moved freely and hyperextension of the neck occurred. A headrest is not mandatory during transit, and evidence has shown in static and dynamic tests that these devices are not capable of withstanding crash loading [1]. The computational model that was created based on the sled testing was then adapted to introduce scoliosis to the spine of the occupant. The curvature of the spine that was introduced is based on x-rays from a scoliosis clinic so that they represent a mild, moderate and severe case of scoliosis. The wheelchair was then adapted to fit the shape of each of the occupants.

The results show that the loading on the spine of the occupant with scoliosis is greater than the baseline case. This is particularly true at the apex of the deformed curvature of the spine. The increased loading is due to an increase in the sagittal stiffness of the spine. Scoliosis also introduces a point loading effect as the deformed shape of the torso interacts differently with the seatback which leads to increased loading on the spine. The introduction of postural supports which create a more contoured surface of the wheelchair to better fit the shape of the occupant's torso was found to reduce the loading on the spine. These supports reduce the motion of the occupant within the wheelchair and hence reduce the effect of the increased sagittal stiffness. The point loading effect is also greatly reduced as the contact force between the occupant and the seatback is spread over the entire torso rather than on a single area. The material of construction of these supports has been found to have a large influence on the level of protection afforded to the occupant. A soft material on the surface of the supports is found to bottom out under crash loading, whereas a stiffer material on the surface of the support provides a greater level of protection. The stiffer surface acts to support the occupant and reduce the occupant's motion.

Discussion

This work investigates the loading on a wheelchair occupant in a rear impact. The baseline occupant predicted high levels of injury due to the absence of a head restraint. Other work in our group has shown that improved design and proper positioning of a head restraint can reduce the predicted levels of injury [2]. The effect of a postural deformity, such as scoliosis, was to increase the loading on the spine. However the level of safety afforded to the occupant can be increased using an adapted wheelchair. A wheelchair which is adapted to fit the contours of an occupant provides an increased level of protection by providing extra support. However the material of construction must also be taken into account as the forces associated with a crash can lead to compression of the soft surface and then contact is made with the harder surface beneath.

Research by Manary et al has found structural failures when commercial wheelchairs were subjected to a rear impact. Failure occurred due to breakages of wheelchair components at the front WTORS tie-downs due to their increased loading in rear impact [1]. The combination of this knowledge with the work presented from this study shows that there is much lacking in rear impact safety. However, the work presented here is a first step to giving a scientific basis to clinical practices which are conducted in seating clinics worldwide.

References

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FREE PAPER 9

Sitting Playfully:
Does the use of a centre of gravity computer game controller influence the sitting and functional ability of children with neuromotor dysfunction?

Presenter: Will Wade

Additional Author: Dr David Porter, Elizabeth Casson Trust Reader in Occupational Therapy, Oxford Brookes University.

Summary
The presentation aims to present the early findings from a randomised cross-over study designed to determine whether using a sitting platform (in place of a joystick) to control computer games has an influence on the development of sitting ability, functional reach and posture for young people with neuromotor dysfunction.

Aims and Objectives
The study aims to determine whether regular use of a computer game(s), requiring adjustment of the player's centre of gravity to control the game, has an effect on the development of sitting ability for children with neuromotor dysfunction.
Secondary outcomes that will be discussed include the degree of engagement in the activity and whether the activity had any functional effects.

Background
Neuromotor dysfunction, an umbrella term for a range of disorders where Cerebral palsy is seen to be the prevalent diagnosis (Reid 2002), often presents children with difficulties in postural control and activities of daily living.
An important part of development and management of posture is to encourage improved sitting ability. Improved sitting ability can in turn lead to improved comfort, functional ability and independence and also a reduction on the risk of contractures, deformity and pressure ulcers (Moreau et al 1979, Bagg et al 1993, Gudjonsdottir & Stemmons Mercer 1997, Pountney et al 2000).
A number of studies have shown the usefulness in improving postural ability training, whether through exercise (e.g. horseback riding) and forms of neurodevelopmental training. Several authors have also recognised the need to identify meaningful activities for children and incorporated these activities within play (Sakemiller and Nelson 1998).
Design
Twenty-three children were identified according to the criteria (notably; neuromotor dysfunction, level three or above on the Chailey Levels of sitting ability and aged five to fifteen years at the start of the study) from across the South of England. Subjects were randomly assigned to two groups receiving intervention / no intervention or no intervention / intervention over two consecutive three month periods. The intervention involved providing a sitting platform and computer interface for use at home or school with various computer games. The computer game is controlled by the participant moving their centre of gravity in the sagittal and coronal planes. Assessment was performed with the Chailey levels of ability, the sitting assessment for children

with neuromotor dysfunction and the Test of Playfulness. A diary was provided to participants to gauge the amount of usage.

Results

Results based on the quantitative data will be presented although at the time of writing act this analysis has yet to be completed. Qualitative feedback provided information about the practicality of use of the equipment with comments helping to explain an apparent lack of usage in certain cases. The qualitative data also suggested staff and children perceived a benefit in using equipment with several noting that children were more confident about moving in their seats. Above all, enjoyment was seen as a large positive factor with many not being negatively distracted by the potential therapeutic benefit.

At the time of writing quantitative data has yet to be analysed fully. Qualitative data includes the frequency of use during the intervention period and with comments that have helped identify reasons for any apparent lack of usage. Many staff and occasionally children perceived a benefit in using equipment with several noting that children were more confident about moving outside their base. Above all, enjoyment was seen as a large positive factor with many not being negatively distracted by the potential therapeutic benefit.

Discussion

The study initially opened up its initial area for recruitment from Oxfordshire and Sussex to the entire South of England and recruitment through schools. The intervention was seen to be particularly useful to staff to engage students in activity that was not usually accessible to individuals. In homes it was variable as to its usage with some difficulties noted with the equipment.

The study suggests that there is a perceived benefit in sitting balance but raises questions as to the components that constitute sitting ability. Confidence to move outside of a person's base could be one important factor and coupled with immersive gaming environments could be an excellent tool to improve confidence. Many therapy departments and schools now own active computer gaming systems with the intention to improve fitness and/or co-ordination, but little evidence exists. Further work is required to look closely at the components of sitting ability and engaging platforms for therapy to improve such an evidence base.

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Friday, April 17th 2009

Aldersea Lecture

"Doctor, engineer or architect"

Dr Linda Marks

Plenary Session 2 (PL2)

Applying Evidence to Practice in Wheeled Mobility & Seating

Presenters: Mark Schmeler and Julianna Arva

Additional Authors: Brad Dicianno, University of Pittsburgh, University of Pittsburgh Medical Center, Pittsburgh, PA; Jenny Lieberman**,** Mt. Sinai Hospital, New York, NY; Lauren Rosen, St. Joseph's Children's Hospital of Tampa, Tampa, FL

Evidence-Based Practice is a growing reality and the field of wheeled mobility and seating is not immune to this requirement. In response, the Rehabilitation Engineering & Assistive Technology Society of North America (RESNA) has developed Position Papers that share typical clinical applications and provide evidence from the literature supporting the application of Assistive Technology interventions to assist professionals in decision-making and technology justification.

This session will review, condense, and summarize the literature within RESNA's Special Interest Group in Seating and Wheeled Mobility (SIG-09) Position Papers and will discuss strength of evidence for each topic. The presenters will summarize the current state of scientific evidence and general clinical applications of seat elevation devices, wheelchair standing devices, tilt, recline, elevating leg rests, and pediatric power mobility to assist practitioners and suppliers in decision making and justifications.

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POSTERS

The posters are displayed in the Lower Foyer of Warwick Arts Centre throughout the event. Q&A sessions with the poster presenters will be during –

1. **Lunch break on Thursday 16th April**
2. **Morning coffee break, Friday 17th April**

Poster Abstracts

Reducing the Risk of Lap Strap Misuse

Presenter: Dave Harrison

Additional Authors:
West Midlands Local Wheelchair Service Managers Group
West Midlands Regional Posture and Mobility Services

Summary
In July 2008 the West Midlands Wheelchair Service Managers group debated the response required to the MDA 2008 037, re Fitting of Posture and Safety Belts. The region response was to produce a DVD as a training aid.

Aims and Objectives
1. To demonstrate the West Midlands collective approach to the MDA 2008 037: Re Fitting of Posture and Safety Belts.
2. Get feedback on the approach from a national peer group.

Background
The West Midlands Region operates within a hub and spoke service provision that includes a Project Engineering service.
In July 2008 the West Midlands Wheelchair Service Managers group debated the response required to the MDA 2008 037, re Fitting of Posture and Safety Belts and tasked the project engineering service to produce a training aid which could be issued by the Local Wheelchair Services and the Regional Posture & Mobility Service to support the prevailing practice of providing manufacturers' instructions along with the education and training given at clinic.
The identified weak area of this practice was felt to be around the inconsistency in which carers involved in the hand-over process passed on the verbal / practical information, and the manufacturers' instructions not giving sufficient emphasis or clarity to the importance of the correct fitting. We believed the evidence for this was the need for the MHRA to re-issue a medical device alert that closely related to that issued (MDA/2005/025) in 2005.

The Project Engineering service researched the topic and produced a training presentation DVD that can be produced on behalf of the individual services / trusts to reduce this risk.
It is this training presentation DVD that we put forward as a combined poster / DVD. The DVD is set to repeat so that delegates who pass the poster stand can view the complete DVD. The DVD lasts approximately 5 minutes.
Review
The West Midlands collectively reviews all adverse incidents on an annual basis and are in a position to continue this practice. We intend to start using the training presentation DVD following this conference and would review our adverse incidents within our region for the next 2 years with a specific focus on incidents that relate to poorly fitted belts.

References
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Prone Wheelchair

Presenters: Kim Creaser (author) and Lorna Tasker

Summary
A customised prone seating system and wheelchair was designed and manufactured for a client who had a history of pressure problems due to his severe spinal deformity. The aim was to provide a form of transport that allows a client with severe scoliosis and potential pressure issues to access a day service, easing pressure and enabling comfort, whilst attending areas of the day centre other than the treatment room.

Aims and Objectives
• To assess the best position for the client in prone position that can be adapted to a wheelchair base.
• To manufacture a system using three-dimensional laser scanning that takes an impression of the customised shape and carves it from foam using a CNC carver.
• To get the client into the system would require hoisting and a prone sling would be needed. This will require accurate measurement and a specialist sling manufacturer to make one.

Background
The client currently uses a Discovery wheelchair base with integrated seating provided by the REU. This is used for transportation and he is frequently moved into alternative positions in order to prevent pressure issues due to his low weight and hence "bony" appearance. At the Day Centre he is put into a prone position on a bean bag wedge in a treatment room. This posture helps reduce his Kyphosis and extend his hips and knees as he tends to have some degree of fixed flexion in these joints. His upper limbs are also in a typical spastic state and the position helps stretch his shoulder joints, particularly when his arms are lifted over the edge of the wedge. The client also has a severe scoliosis of the spine which tends to bring his ribs on the right side close to the pelvic bone on the same side. This is the main concern of the Rehab Engineer for seating purposes. The prone posture helps open this out but there is still potential for pressure issues due to the rotation associated with the scoliosis. The client also tends to rotate his head to the left side for comfort.
He is hoisted from his wheelchair onto the wedge to lie on his back; then he is rolled, sometimes using a glide sheet, onto his front. At his home he has an overhead hoist in his room but his carers prefer to lift him manually onto his bed and into the easy chair he has there.

Complications
1. The client has swallowing problems that have been assessed by a SALT and advice has been that his food should be liquidised. He has low weight and great potential for pressure sores. This

situation is being monitored and it is hoped that an improved outcome for his weight issue will prevail.
2. The Client is incontinent and wears a sheath so that urine can be collected and released from a bag. He also wears a pad in case there is leaking from this system.
3. The Client also has communication problems. He might indicate when he is in pain by moaning or grimacing but this is not consistent, though staff and family can usually recognise when there is a problem. There may be issues over consent but his family appear to have agreed to bring him in daily for a fortnight to set up moulding.
4. The Client has regular seizures. Staff can recognise when he is about to have one as he goes rigid and stares.

Discussion
The original idea came from a discussion about the client's current wheelchair and about his positioning to prevent pressure problems. Physiotherapy experience informs that this prone position is a comfortable position for this type of client. A 3D laser scanner was used to record his unique shape from the bead bag impression of the client's front. This digital impression allowed the customised CAD/CAM manufacture of a foam system which was mounted to an adapted wheelchair base. Pressure mapping was performed throughout the design of the system to ensure that the customised system provided low pressure readings. The system was successful as it allowed the client to off-load his pressure areas on his back whilst having the ability to be mobile in this position within the day centre.

People Involved
REU Engineers
Physiotherapist for client
Physiotherapist to integrate services
Client
• Male (26 years)
• Weight 38.2 Kg (84.2 lbs-6 stones 3 ounces)
• Cerebral Palsy with Spastic Quadriplegia

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PAPAW

A Single Blind, Controlled Study to Assess Advantages of Pushrim Activated Power Assisted Wheelchairs (PAPAW)

Presenter: Joyjit Sarkar

Additional Authors
Rachael Harwood (King)
Edward Laskey
Dr Bandara Panagamuwa
Dave Harrison

Summary
This study aims to establish criteria for NHS provision of PAPAWs. Within a cohort of 33 wheelchair users, a consistent energy saving was demonstrated. In a brief qualitative survey, all except CP patients perceived benefits from the PAPAWs.

Aims and Objectives

- To compare energy consumption between Manual Wheelchairs (MWCs) and PAPAWs by a group of established wheelchair users with a range of disabilities.
- To assess user satisfaction in this group for PAPAWs.
- To establish standards and criteria for provision of PAPAWs within the NHS.

Background, method and results

PAPAWs have pushrim activated motors delivering power to the wheels during manual propulsion. These wheels are detachable and can be fitted to folding frames which are advantages over standard powered chairs. Even though PAPAWs where found to reduce effort and energy consumption in laboratory conditions the benefits have not previously been tested in clinical conditions. Criteria are nonexistent for NHS prescription. This study attempts to address these issues.

Thirty three consenting randomly selected adult self-propelling wheelchair users (17 male, 16 Female, Mean age 47±14.7, range 20-77, 11 SCI, 7 Amputees, 5 CP, 3 MS and 7 Others) underwent four trials each on an outdoor track consisting of a level and gradient component altogether measuring 50 metres. Each trial consisted of participant using either their own MWC, the wheels changed to PAPAWs with the power on and off or a dummy pair. The trials were carried out in a randomised order, with the participants being blinded to the type of wheels. Participants rested for 20 minutes between trials during which they answered a satisfaction questionnaire. Metabolic cost and time for each trial was recorded using the Cosmed K4b2 system. Arm strength was also measured using a spring balance.

Energy consumption data was analysed using a multi variate analysis, a simple T-test was further used to analyse the significant effects. User satisfaction was assessed using a Mann Whitney U test. Correlation between upper limb strength and energy consumption was analysed using Pearson's correlation.

Six participants were unable to negotiate the slope in their MWCs, but were successful with the PAPAWs. Three participants (1 CP, 1 SCI and 1 arthritis) could not complete the trials. All others used less energy with PAPAWs turned on but this saving did not reach statistical significance. Arm strength correlated positively for MWC but not for PAPAW.

Overall there was a significant difference between perceived benefits for PAPAWs over MWC. Participants with CP rated the PAPAWs significantly lower than their own MWC, the reverse being true for all other diagnoses. The theme emerging from the qualitative study was that PAPAWs would be of benefit for users. Ability to control the PAPAWs was an issue; however participants thought they would be able to over come this with practice. Weight of the PAPAWs emerged as a negative general comment, more so with highly active MWC users.

Discussion

Previous studies under laboratory conditions involving PAPAWs demonstrated significant energy savings. All participants who completed the trials in this study consumed less energy with PAPAWs than with their own MWC or PAPAWs in non-powered modes. The small amount of work done in this study may have resulted in the lack of significance in energy saving. It maybe that users who choose to use PAPAWs will gain significant energy benefits in daily use. Further studies will be required to demonstrate this.

From this study it can be recommended that a practical test is done to assess a potential user's ability to use the chair. Bi-manual dexterity and cognitive ability appear to be important factors for proper propulsion. All subjects who use the PAPAWs successfully gave positive comments about its usefulness. However there was a general disappointment with the weight of the wheels which has to be addressed by the manufacturers. There appears to be a group of high end users who would derive maximum benefit from PAPAWs. For others, weight appears to be an issue which needs to be addressed. Some training may be required for the marginal users.

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Fire resistance of special seating: Sharing our experience of product recall and upgrade

Presenter: Mr John Tiernan

Summary
This presentation will look at national and European legislations relating to 03upholstered seating, and consider the experience of Enable Ireland's **Seat**Tech Service when recalling and upgrading a large number of special seating systems that did not meet stringent domestic furniture fire resistance requirements.

Aims and Objectives
To offer insight into national legislations relating to the fire resistance of upholstered furniture in Ireland and in the UK, and to share experience gained, and lessons learned, by undertaking a product recall. The following will be covered:

- Identification of the issue
- Setting the legislational context
- Identification of solutions
- Deciding upon course of action
- Conducting the upgrade
- Benefits arising

Background
SeatTech provides a user-focused postural management and mobility assistive technology service, with both clinical and manufacturing facilities, from its base in Sandymount. **Seat**Tech is classified as a custom-manufacturer of medical devices.

Postural support devices are designed to help control an individual's posture in a manner that maximises their functional independence. Materials used in the manufacture of **SEATTECH** devices are selected to provide comfort and postural support while minimising the risk of pressure sore development. In the design and manufacture of these devices, **Seat**Tech strives to conform to national legislation and to meet the Essential Requirements of the European Medical Devices Directive (MDD). The Irish Fire Safety Domestic Furniture Order [1] (similar to the UK Furniture and Furnishings Regulations [2]) states that it is unlawful to manufacture or assemble or sell

furniture unless the materials comply with Clauses 2 or 3, as may be appropriate, of I.S. 419:1988, i.e.

- Polyurethane (PU) Foam BS5852:1990, Source Grade Crib 5 [3]
- Non-Polyurethane Filler BS5852:1990, Source Grade Crib 2
- Upholstery Material I.S. EN 1021-2 [4]

For many years **Seat**Tech has been using an upholstery fabric that was supplied on the understanding that it is highly flame resistant. When **Seat**Tech undertook independent testing it was discovered that the upholstery material failed to meet even minimal fire resistance tests. Having discovered the flaw in the material **Seat**Tech was keen to address the matter urgently. The first step taken was to bring the matter to the attention of senior management within the Enable Ireland parent organisation, and to seek guidance on the best course of action to be followed. Correspondence with the UK Medicines and Healthcare Regulatory Agency (MHRA)had concluded that, strictly speaking, national furniture regulations do not apply to medical devices, which come under the remit of the MDD. Correspondence with the Irish Medicines Board (IMB) concurred with this opinion but, under best practice principles, placed an onus on **Seat**Tech to minimise the risks posed to the users of seating systems by striving to meet the requirements of the national furniture regulations, as well as the MDD, unless clinical evidence could be found not to do so.

SeatTech decided to modify fabrication techniques to include the use of a barrier layer of flame retardant 'Firecheck' fabric interliner and to test the composite product to crib 5 standard. Following successful test results a product recall was undertaken over an 8-month period to facilitate retrospective inclusion of the Firecheck barrier layer in all products in current use. To upgrade all systems in as efficient and effective a manner as possible, a prioritisation method was devised on the basis of a risk assessment; the order in which systems were called for upgrade work to be undertaken was dependant upon the risk associated with the continued use of the system. The product upgrade work is now complete. No further upholstery fabrics will be adopted for use by the service without first testing them to the relevant ignition resistance standards. While the upgrade was a costly exercise, in terms of money and time, many spin-off benefits arose for both **Seat**Tech and its service users, and these will be considered.

Discussion

The MDD advocates a risk based approach to product design: 'devices must be designed and manufactured in such a way that, when used under the conditions and for the purposes intended, they will not compromise the clinical condition or the safety of patients…provided that any risks which may be associated with their use constitute acceptable risks when weighed against the benefits to the patient and are compatible with a high level of protection of health and safety.'

The welfare of the end user is always central to the prescription, design and manufacture of **Seat**Tech postural support devices. While the likelihood of a wheelchair catching fire is remote, it can and does happen. The effect on a service user in such an event could be critical – even fatal. It is important therefore to take all reasonable steps to protect the user should they become exposed to such a hazard.

Through the process described in this paper, **Seat**Tech has come to a point where representative samples of seating components are tested to the stringent composite crib 5 flame resistance level,and this test is applied to new material combinations before going into production.

That said, conformance to this standard has severely limited our upholstery material options and, as the need arises, there should be room for flexibility. This brings us back to the notion of case-specific team-based risk/benefit analysis to empower clinicians to select the solution best suited to the clinical requirements of their clients. It is understood at the time of writing that this approach will be advocated by the fire resistance standards currently being reviewed and developed by the international standards organisation (ISO).

References

[1] Irish Statutory Instrument No. 316 of 1995 – Industrial Research and Standards (Fire Safety) (Domestic Furniture) Order 1995

[2] (British) Statutory Instrument No. 1324 of 1988 – The Furniture and Furnishings (Fire) (Safety) Regulations 1988

[3] BS5852:1990 Methods of test for assessment of the ignitability of upholstered seating by smouldering and flaming ignition sources
[4] EN 10021-2:1994 Furniture – Assessment of the Ignitability of upholstered furniture – Part 2: Ignition Source Match Flame Equivalent

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Add-On Powered Devices- an expense too far?

Presenter: Lis Hook

Additional author: Gary Nash. Senior Technical Instructor

Summary
About 75% of users in the UK have been supplied with a wheelchair through NHS Wheelchair Services. Only a minority of services provide or support power packs. In 1998, KCH WS, now Southwark PCT, allocated a small budget to trial 10 devices. Ten years on, over 100 have been provided.

Aims and Objectives
Southwark NHS Wheelchair Service has recently carried out a comprehensive audit with users and carers with power-packs on issue. Here we would like to discuss the findings, and look at the benefits to wheelchair users and their carers, weighed against the financial and operational constraints of wheelchair services.

Background
For people whose mobility is affected by disability, illness or age, wheelchairs make an important contribution in improving independence, freedom and quality of life.
The majority of the 1.2 million wheelchair users in the UK have manual chairs. Wheelchair users vary widely in terms of capability and lifestyle, and conventional manual or powered chairs satisfy the needs of many users and their carers.
Add-on power devices are designed for niche markets to allow particular chair users to maximize their independence or to reduce demands on carers.
Power packs are devices designed to assist the attendant in pushing. They typically mount behind and under a manual wheelchair seat with the drive wheel mounted directly between the rear wheels. This position allows the system to add propulsive power, making the chair easier to push over uneven or sloping ground, without impacting greatly on manoeuvrability or interfering with the person pushing the chair. They can be relatively easily detached to allow the chair to be folded.
The aim of the trial initiated in 1998 was to offer a minimal level of support to those clients/carers, often elderly, requesting increased assistance with outdoor mobility, but who were ineligible for EPIOC supply. Subsequently, a criterion for provision was identified, aimed at the clinical/medical needs of sole carers of wheelchair users supplied with manual chairs by the service. A comprehensive assessment process was designed, alongside appropriate risk management and training procedures, to ensure that the power-packs were issued to those clients/carers who would gain maximum benefit from the provision. A follow-up audit confirmed that the majority of the 10 clients/carers provided with this device responded positively to its usage, concurring that the trial should be extended.

Now in 2009, over a hundred users and their carers have benefited from the supply of power-packs to their manual wheelchairs. A new audit, involving a telephone questionnaire, has recently been carried out, looking at the usage, advantages and disadvantages of these devices, plus the overall level of satisfaction expressed by our service users.

Discussion
The provision of power-packs on a large scale by NHS Wheelchair Services would be expensive, but the costs may be offset by savings in other healthcare expenditure. Also the "quality of life" increases that are reported by clients and their carers could be translated into reductions in spending on the treatment of health-related impacts of dependant lifestyles, including depression and related illnesses.

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Buyers Guide "Add-on power devices for manual wheelchairs"
CEP 08033 August 2008 Centre for Evidence-based Purchasing
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Pilot study to analyse the sitting position and type of seating used by UK nursing home residents and the criterion validity of the Seating Identification Tool (SIT)

Presenter: Jane Menzies

Summary
The posture and seating of nursing home residents was analysed and compared with the SIT tool in order to determine level of agreement and prevalence of need for formal seating assessment.

Aims and Objectives
- Analyse the sitting position and type of seating used by a sample of nursing home residents
- Assess the criterion validity of the Seating Identification Tool (SIT) by comparing agreement with an expert assessment (criterion)

Hypothesis One
UK nursing home residents are generally poorly seated and there is a high prevalence of need for seating assessments

Hypothesis Two
There is agreement between the SIT and the outcome of an expert assessment, indicating criterion validity

Background
Currently 4% of the UK population over the age of 65-years are resident in a care home, a percentage which is expected to rise significantly as the UK population ages.

There is growing evidence detailing the health and care-cost benefits of appropriate seating. However, research indicates that many nursing home residents are poorly seated with a high

prevalence of need for formal seating assessments. Estimates from North American studies suggest a prevalence of need ranging from 22%-80%.

Literature exploring seating of the UK nursing home population is limited and there are no recently published studies which specifically quantify or examine the seating in UK homes. Studies suggest that there is insufficient therapy provision within UK nursing homes to rely on therapists to instigate seating referrals and there is concern that nursing home staff do not have the relevant skills to identify whom to refer for seating assessments. A situation compounded by a lack of access and knowledge of appropriate services and clear funding pathways to enable provision of equipment. The Seating Identification Tool (an eleven-item tick box screening tool) was developed, in Canada, as a screening tool to help nursing home staff identify appropriate referrals. This study was designed to explore the validity of this tool when used with UK nursing home staff and residents.

A nursing home in Oxfordshire was selected using convenience sampling. Permanent residents (for at least 2 months) who:- used a hoist to transfer, sat out of bed at least once a week and able to give informed consent were included. Six residents participated in the study and were aged 51-102 years. Five had a primary or secondary diagnosis of dementia and one of learning difficulties/arthritis.

One health care assistant participated in the study fulfilling the criteria that she was a permanent employee of the nursing home, had worked closely with the resident for at least four weeks, and gave informed consent.

Each resident was assessed in their primary seating system. The researcher completed a basic analysis of the sitting posture of the residents involving observation and palpation of the ASIS (Anterior Superior Iliac Spine). The health care assistant completed the Seating Identification Tool for each resident. Basic background medical information was recorded.

The researcher (criterion) assessment found that all residents were poorly supported in their seating and there was an 83% (n=5) prevalence of need for formal seating assessments.

Residents were sat in standard sized high backed armchairs (n=4) or standard wheelchairs (n=2), with both tending to be too large. All residents presented with postural asymmetries, pelvic obliquity, leaning to the side and asymmetrical weight bearing through the buttocks. Residents were generally sitting for prolonged periods, between 8-13hours. No residents had pressure ulcers; however, five of six presented with redness on their buttocks, two of which did not have pressure-relieving cushions.

The SIT identified a prevalence of need of 67% and showed a sensitivity of 60% (95% CI 0.17 – 0.93), with a specificity of 0% (95% CI 0.00-0.95). Analysis of agreement with the criterion did not reach statistical significance.

Discussion

Consistent with the findings of previous studies, all residents were given seating without formal assessment leading to a mismatch between postural needs and their seating. Chairs appeared to be chosen according to availability, and choices were limited to either wheelchairs that residents were admitted with, or standard high back armchairs.

The results of this study suggest acceptance of research Hypothesis One. Statistical analysis indicates that Hypothesis Two should be rejected in favour of the null. However, caution should be utilised as due to the small sample sizes there is a high probability of type 2 errors.

Analysis suggests that the SIT shows a greater ability to reliably predict when a seating assessment is required rather than when one is not necessary, which is clinically preferable. It was found that whilst the SIT was simple to implement, one question was consistently recorded inaccurately which negatively impacted on the agreement between the expert and the SIT.

It is the author's opinion that the value and generalisation of this study would have been enhanced by the inclusion of incapacious residents. The exclusion of these residents (due to

ethics approval) may have skewed the results to underestimate the level of need and usefulness of the SIT.

This study should be viewed as an indicator of trend and a first step in quantifying the need for seating assessments in the UK nursing home population. Further research into the prevalence of need and the clinical usefulness of the SIT as a screening tool is warranted.

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Wheelchair provision to people with Spinal Cord Injury before and after the Voucher Scheme

Presenter: Lone S Rose

Additional Authors: Martin Ferguson-Pell, PhD

Summary
The introduction of the Voucher Scheme in England heralded the biggest change to wheelchair provision since 1991.Two national surveys were carried out covering 1991/97 and 1997/2004 to establish patterns of wheelchair provision to people with Spinal Cord Injury (SCI) during these periods.

Aims and Objectives
• Compare results from the two surveys
• Identify changes in patterns of provision
• Evaluate recommendations from first survey

Background
The first survey was carried out to establish wheelchair provision to people with SCI before the introduction of the voucher scheme. This formed the baseline for the second follow-up survey covering a similar period.
Subjects:
All patients discharged with a wheelchair from a UK Spinal Cord Injury Centres (SCIC) were invited to take part. All subjects had to be resident in the UK and entitled to a NHS wheelchair.
Methods:
Data was collected by postal questionnaire. In total 2145 subjects took part, 939 and 1206 respectively. Data collected concentrated on the types of wheelchairs used on discharge ('first') and at the time of taking part in the survey ('present'). Other areas explored were: assessment, length of time before changing the wheelchair and reasons for change.
Additional information gathered in the second survey related to use of interim provision, user satisfaction and upper limb pain.
Results:
Demographics from both periods were comparable and representative of the SCI population.
Results presented concentrate on full-time, manual wheelchair users:
In 1991-97 basic or minimally adjustable wheelchairs accounted for 83% of provision on discharge compared to 49% in 1997-04. This was reduced to 40% and 32% respectively for 'present' wheelchair.
In 1991-97 46% of users changed their wheelchair within one year of discharge compared to 20% in 1997-04.
Main reasons for changing were 'pushability' and comfort in 1991-7 compared to comfort and weight of wheelchair in 1997-04.
The NHS funded 88% of 'first' wheelchairs in 1991-97; 65% in 1997-04 with a further 24% using a voucher. Of 'present' wheelchairs 49% were funded by the NHS in 1991-97; in 1997-04 pure NHS funding accounted for 39% with 24% using the voucher scheme. Other sources of funding were pure private funding, charities and Access to Work.
In the 1997-04 period 46% of respondents were discharged with interim provision.
User satisfaction results show that 70% of subjects report being satisfied or very satisfied with their 'first' provision, increasing to 88% for the 'present' wheelchair.

Discussion
The range of wheelchairs used by respondents at the time of the first survey is now reflected in the range of wheelchairs used as 'first' wheelchair in the later survey.

The recommendation in the first survey to consider interim provision has been adopted in 61% of discharges.

The trend towards the NHS supplying more sophisticated wheelchairs in the second period is reflected in the reduction in early change of wheelchair.

User satisfaction scores were excellent and may be a reflection of the greater involvement in the choice of wheelchair which the voucher scheme gives the user.

Pure NHS funding accounts for 39% of wheelchairs used long-term. This suggests a continued reliance on external, additional funding to obtain the wheelchair of choice for this user group.

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The Design Characteristics and Properties of Materials Used in the Construction of Wheelchair Cushions.

Presenter: Kieran Cheer

Summary
A description of the various materials used in the construction of wheelchair cushions, describing their advantages and disadvantages and how they relate to the various design characteristics, such as surface contouring, in order to produce the end product and the resulting attributes of that product.

Aims and Objectives
To discuss various materials and design characteristics used in the construction of wheelchair cushions, including how the shape and orientation of the cushion can affect the desired outcomes for the user. How different materials and designs can help achieve the required amounts of support, stability, pressure distribution and function. To show how an anterior sloping seat surface can allow the spine to extend into a more neutral and desirable position.

Background
When seating people with physical disabilities in wheelchairs it is usual to aim for a neutral pelvic position, which requires a seat cushion of an appropriate prescription, as well as adequate posterior support of the pelvis and lumbo-sacral spine.
In order that the ideal seated posture can be achieved and maintained the inferior and posterior supports that are used, need to work in conjunction with the anatomy that they are supporting and the supports need to be able to take into consideration and work with the forces that the anatomy applies to those surfaces.
Using appropriate materials in the construction of wheelchair seat cushions can:
• Improve pressure distribution by maximizing the overall surface area of contact.

• Reduce dynamic shear by providing some ‘flow’, which would allow bony prominences some limited movement within the seat surface.
• Provide required levels of support in order that the client remains in the intended position on the seat cushion.
• Provide breathability which decreases heat and humidity at the tissue level.
Shaping to accommodate the anatomy or exaggerations of anatomical shape can help:
• Improve pressure distribution by maximizing the overall surface area of contact. (Pressure=Force/Area)
• Re-distribute pressure by increasing weight bearing on the trochanters and thighs, thereby reducing weight bearing on the ischial tuberosities and sacrum.
• Reduce static shear by providing pre-ischial support and inferior sacral shaping, which work together to prevent posterior pelvic tilt and downward pelvic migration.
• Promote a neutral pelvic position by using a trochanteric shelf, sacral shelf and pre-ischial bar.
• Position the knees lower than the pelvis, allowing the thighs to be at an anterior sloping angle which enables the lumbar spine to extend which in turn promotes good thoracic positioning and maximizes upper limb function and head position.

Materials Facts

Foam

Polyurethane foams vary greatly in their quality and properties depending on which chemicals and processes are used in their manufacture. All foams can be classified by three main properties:
Density, Indentation Load/Force Deflection (ILD/IFD) and Modulus.
When foam is optimally shaped and used in layered combinations it can provide a supportive and stable cushion that will maximize the surface contact area and re-distribute pressures away from bony prominences onto more fleshy areas. No maintenance, lightweight, durable.
Issues are potential peak pressures and ability to weight shift.

Air

Very good pressure distribution due to the enveloping of the buttocks, which maximizes the surface contact area. Air provides dynamic shear reduction by allowing bony prominences to move within the cushion. Lightweight cushions. Issues are the frequent monitoring that is required in order for the cushion to be effective and the lack of stability that air provides.

Fluid

Can reduce pressure at bony prominences because of its ability to conform to the shape of the body. Reduces dynamic shear because the gel will allow movement across its surface.
Issues are maintenance, weight and reduced stability which may allow undesirable postures such as posterior pelvic tilt, pelvic obliquity and sliding which may lead to shearing.

Discussion

No matter how complex or straight forward the client’s postural needs may be, seating people with various degrees of disability in postural wheelchair seating can be a complex and challenging task but by assessing the client’s posture, mobility needs and functional requirements thoroughly allows the application of appropriate equipment which fits the client’s anatomy, posture and social needs.
A well designed cushion, whether it be an “off the shelf”, bespoke or custom-made product, will provide good pelvic alignment which will lead to a good spinal position and shape which in turn increases stability and functional ability. This will also result in the back support having less force exerted through it because the spine will be in a more natural and balanced posture.
By understanding the different properties of the materials that are used in the construction of wheelchair cushions, the clinician will have knowledge of the advantages and disadvantages that various materials offer. While using this information in conjunction with an understanding of the various design characteristics of wheelchair cushions and taking into account the various needs of the client, the clinician will be able to make a fully informed decision about what equipment should be prescribed in each circumstance.

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Babes in the Hood

Presenters: Peter Lane and Marion May

Summary
This presentation is a case study. Client presented at a paediatric seating clinic with Warburg Micro Syndrome IUGR. By addressing the complex requirements of this case, we developed and produced a solution to meet the client's clinical needs and the carer's wishes for the equipment to meet social and lifestyle needs.

Aims and Objectives
Aims
Provide a posturally supportive system of appropriate seat size, with a moulded backrest.
• Use a hood and raincover to provide protection from the elements with regard to the clinical presentation of Warburg Micro Syndrome IUGR.
• Provide equipment which is acceptable to parents, regarding lifestyle and sociological needs.
Objectives
To encourage acceptance and use of clinically appropriate equipment by promoting 'normalisation' of a complex seating system.

Background
In this particular case the child had no eyelids, resulting in hypersensitivity to light and wind.
The postural presentation showed general asymmetry with pelvic rotation forward on the left, windsweeping right, a lack of extension with flexion contractions at both hips. Plagioencephaly on the right and hyperextension of cervical spine.
Unable to sit without full support (Chailey Level 1 Pountney et al 2004) requiring a very small seat size of 17cm x 17cm (6.75" x 6.75") knee to heel length of 15cm (6"). There was a need to sit facing carers whilst in mobility equipment because of clinical and social needs.
No standard systems were available to fully accommodate clinical needs; we therefore decided to use a Mini CAPS with Lynx backrest (to accommodate asymmetry) and provide developmentally appropriate equipment to the size required.
At the moulding stage client's parents raised concerns regarding aesthetics and lifestyle needs. In response to identified issues and the clinical need of hypersensitivity to light and wind, we decided to adapt the Mini CAPS to allow fitment of the Tom Cross Country Stroller buggy hood, extended side protection and raincover. At this stage the parents also decided on the Tom Cross Country Stroller wheelbase over the Otto Bock Kimba 1 wheelbase, as it better met their lifestyle needs. With such a small seat size interfacing onto a buggy base, it meant there were large gaps between the seat and buggy side frames and client's arms could potentially drop in the gap because of low tone and lack of voluntary movement. We therefore designed bolt on armrests/side panels as a solution. An adaptation to the Tom buggy wheelbase allowed the seat to be rear facing, with the tilt still functional in the correct plane.

On delivery of the equipment we were able to meet the clinical/postural needs of the child. By using the outlined adaptations the issues raised by the carers regarding sociological, psychological and lifestyle needs were also addressed and resolved.

We now offer the option for other carers to purchase the hood/raincover and we facilitate fitment.

Discussion
Current proprietary equipment was not available to meet the complex clinical, social, environmental and family issues raised in this case.
As a result of this unique set of requirements the adaptations used are now available for a broader spectrum of needs.
We have enabled carers to accept equipment that meets a clinical need, which may previously have been rejected on lifestyle grounds.

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We wish to thank the following companies for generously supporting and sponsoring NTE 2009

Active Design and Paul Hewett: Webcasting project

Days Healthcare: Icebreaker Casino Night

Invacare: Delegate Lanyards

Specialised Orthotic Services Ltd: Delegate Bags