UPDATE

Summary of BACPAR AGM November 2016

BE INSPIRED

NHS England Prosthetic Policies: MPK & Paediatric Activity Limbs

LEARNING

MSc Amputee Rehabilitation Update

BRITISH ASSOCIATION OF
CHARTERED **PHYSIOTHERAPISTS**
IN **AMPUTEE** REHABILITATION

ADVANCES IN NHS PROSTHETIC PROVISION

SPECIAL EDITION

SPRING 2017 **ISSUE 47**

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BACPAR

SPRING IS HERE

Julia Earle

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CHAIR MESSAGE

CONGRATULATIONS and massive thanks go to the guidelines committee headed by Sarah Smith on their amazing work in producing the updated pre and post op guidelines, never an easy task. On top of this they also have had the process accredited by NICE, the only physiotherapy guidelines to have achieved this! Happy implementing everyone, to our members you will find these attached to this journal.

So another BACPAR year starts on a high and what a busy one it is going to be.

We have just held our Executive Committee meeting and so a few updates: Hot off the press – preparations have started for 2017 conference – Back in Wolverhampton by popular demand and on the 16th and 17th November.

Initial ideas for themes are being discussed and speakers suggested so if anyone has any burning ideas or offers etc., I'm sure the organising committee will be happy to hear from you, please emai Sue: **bacpar@flutefamily.me.uk** and I'm sure there will be more detail out soon.

As you can imagine there have been lots of discussions about the MPK policy. Imad Sedki has written an article for the journal and Amy Jones a brief update on where our discussions have got to so far. Hopefully those that will be involved in the MPK rehab are able to get to some of the training days being offered by the manufacturers and there are several discussions on iCSP. It will definitely be a theme at the conference in November and SPARG are updating their knee guideline document so this will be very helpful and something to look out for. I know many of those involved are apprehensive about the amount of physio input this requires and I know we will all be supporting each other through this.

Provision of children's sports prosthetics is also underway and we continue to have representation in this through Lynn Hirst and Rachel Humpherson.

ISPO South Africa is also taking place soon and there are going to be seven BACPAR members presenting – best wishes to all and lets continue to promote BACPAR all over the globe!

So much more going on but I'm sure you want to get on and read the rest of the journal...
Louise

EDITORIAL

Jodie Georgiou

BACPAR Journal Officer

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Welcome to the BACPAR Journal, Spring 2017 which is another Special Edition!

Social Media
Follow BACPAR on twitter **@BACPAR_official**
Like our BACPAR facebook page **BACPAR_Official**

Please email the new BACPAR Public Relations Officer (PRO) any upcoming regional study days, or topics of interest if you would like them to be posted on Twitter or Facebook. BACPAR PRO email address: **bacparpro@gmail.com**

Mention BACPAR in your posts, to have us share these to BACPAR's followers. Lets raise awareness of Amputee Rehabilitation in the UK, and keep BACPAR's stakeholders updated on our activity!
Jodie

NEXT EDITION DEADLINE FOR SUBMITTING CONTENT IS: **11TH SEPTEMBER 2017**

JOURNAL SUBMISSION GUIDELINES

Submitting an Article:

- Send any articles or posters as a **MS Word, MS PowerPoint or PDF file**.
Please add your name, role and optional email address.
- If your article includes any pictures please send them **separately** as a JPEG or PNG file. **All images must be high resolution.** Low resolution images will be rejected.
- Send graphs as separate Excel files and name these the same as your article followed by a number in the sequence that they appear in the article (as with pictures).

Please submit your files to: **bacparjournal@gmail.com**.

MEMBERSHIP UPDATE

Lynsey Matthews

Honory Membership Secretary

Specialist Physiotherapist

Portsmouth Hospitals NHS Trust

bacparmembership@gmail.com

I am Lynsey Matthews and I have taken over the role of Membership Secretary from Gill Atkinson since the end of last year. Gill ran a very organised and well oiled ship and I am sure that all the membership would like to join me in thanking her for all her hard work, efforts and vast amount of time that she committed to the BACPAR Committee over the years.

I have a lot to learn so please bear with me if I am a little slower at responding to emails or needing to seek advise with your queries. As this is renewal time it is a busy time of year. I would like to remind everyone of the importance of completing the professional profile form available on the website and email to me, this is for those renewing their membership as well as new members. This will then ensure that I have all your up to date information so that you receive any email correspondence and the BACPAR Journal. It also enables BACPAR events such as conference and region study days to be aimed at your learning needs.

BACPAR BULLETIN

SUMMARY OF BACPAR AGM

10th November 2016
This years AGM was held as usual during the BACPAR conference, this year in Liverpool.

The full AGM minutes can be found on the BACPAR website: **http://bacpar.csp.org.uk/icsp/topics/2016-agm-minutes** but it was agreed to include a short summary in the Journal so here goes!

68 members were present and apologies received from 12.

Minutes of the Previous AGM November 2015 Wolverhampton were agreed.

A couple of matters had arisen from questions at the last AGM:

- Outcome measures – Judy scopes was completing her PhD in outcome measures and has declined further involvement at the current time, understandably wanting a break from clinical work. Maybe there would be someone else willing to look further into current practice?

- SW region – there had been no offers to re-establish the SW region.

CHAIR'S REPORT:

An extensive list of BACPARS achievements against our work plan is included in the AGM minutes but a few of the highlights were mentioned:

- The long anticipated Amputation Rehabilitation and Prosthetic Use Module had started in Southampton and had 16 participants.

- The Pre and Post Op Guidelines which are very well respected throughout the world, we recently had a request for permission to publish in Turkish, are nearing completion and are now with NICE hoping for accreditation and with CSP for endorsement. An enormous amount of work has gone into these by Sara and her team in the Guideline Update Group and a full report is included in the minutes. Hopefully they will be available very soon. It was also agreed by a vote later in the AGM to print copies of the guidelines, an audit document and patient information. These would be sent to members and some spare copies kept by BACPAR.

- There had been many well attended regional study days around the country and thanks expressed to all those involved.

- "So your patient has had an amputation" leaflet is now available on the BACPAR website, iCSP and had been promoted in the Westminster Cross Party Limb Loss Group minutes. Why not use it at study days, promote it to new physios and those with little experience in the field.

• All 3 of the recent receivers of BACPAR **Research bursaries** were presenting at this years conference or giving an update on their work so far.

• **Membership numbers** have increased this year from 180-230 which is very encouraging and helped by the improved payment system and included 35 new members this year.

• To be responsible for any material on display at meetings and other events.

The **BACPAR accounts** can been seen in the minutes and Kat explained that in the future the funding as a result of training opportunities such as the Handicap International training and regional study days would be separated out to enable the detail to be seen.

Reports from SPARG and the Guidelines group followed.

QUESTIONS TO THE MEMBERSHIP:

1) The membership were asked views of the creation of a closed Facebook Group, to support communication and networking between Therapists.
Response- The membership are happy for the exec to continue to explore this, concerns were raised around confidentiality and patient's ability to contact Therapists. The BACPAR exec and especially the PRO's would continue to explore this potential development. Rachel Neilson requested people contact her about why ICSP is not utilised to it's fullest.

2) The Membership were asked if members had any ARC Motions to be submitted, or if Members wished to attend using BACPAR's 2 free spaces.
Response- No ARC Motions offered. No requests to attend ARC. Any wishes to attend should be directed to Julia Earle.

3) The Membership were asked if they are happy for the exec to continue to make decisions around the allocation and amount of educational bursaries according to the requests received and the actual total need of the applicant.
Response- The membership are happy for this to continue.

There were no further questions asked by the membership.

ELECTIONS

The following were voted in by the membership:

ICSP Facilitator
Rachel Neilson (2nd term)

Membership Secretary
Lyndsey Matthews

Honorary Treasurer
Katharine Atkin (2nd term)

Public Relations Officer
Hannah Foulstone and Hayley Crane in a shared role

There was no AOB raised.

If you have any questions about the AGM or the report please see the full minutes on the BACPAR website, if they are still not answered of course contact me via: **bacpar.chair@gmail.com**

ICSP REPORT

WHAT CAN IT DO FOR YOU?

As the iCSP Facilitator I have noticed the usage of our section of iCSP is a little on the quiet side but why is this? Our network, Amputee Rehabilitation, has over 3800 members but is only used on a regular basis by a small number of these. The Network membership is not only made up of BACPAR members but also students and physiotherapists in other fields who have an interest in or need information about amputee rehabilitation. It can be used as a resource for asking questions, finding resources and gaining knowledge. It is important, especially for these non-BACPAR network users, that our content is up to date, relevant and useful to all as this is the face of our organisation within the UK Physiotherapy world. So what does our iCSP network offer you?

Events

The events section lets network members and the committee advertise BACPAR events around the country so the details are available to not only our own membership but others in related fields who may be interested. Details can be added by members or the Facilitators and they are then disseminated as part of the regular bulletins issued by the network. If you or your Region are planning a study day then make sure you get it on iCSP so the details are easily available to all and you can also encourage out of area applications if this is helpful to you. This can help improve attendance rates and make the running of events more viable for smaller groups. You might be surprised at the interest in your chosen topic! This has certainly proved useful for the Midlands region who have had applications from all over the country to their regional study days when advertised on iCSP.

News

This section gives the chance for a wide variety of topics to be brought to the attention of the network members. It could be a (low cost) non-BACPAR event that you think may be of interest to patients or physiotherapists such as running/sports events or perhaps news regarding lobbying parliament on Amputee Rehab issues or a local news story that is relevant. All content submitted is checked and moderated by the facilitators and if appropriate will then be published for the network to view. You can add documents or flyers to these item or links to a relevant website.

Documents

This section allows both the committee and membership to upload relevant documents that may be useful to the network membership. So far these have included patient information leaflets, service/satisfaction questionnaires and the minutes of various groups which BACPAR are working in cooperation with. Perhaps you have a local document that you think facilitates best practice? Or maybe you have been part of a group working on a patient information leaflet that you are particularly proud of... Why not share the results and help your profession move forward!

Clinical Case Discussions

Have you had a case where you had to think outside the box? A patient where you had a particular challenge or good result? Then this is the place to share it. You never know there might just be someone else out there struggling with a similar situation that could benefit from your experience. Sharing practice is a great way to improve the skills of the profession and is good for your CPD portfolio too. If you have a case you can publish on iCSP (remember to make sure there is no identifiable patient information in

what you submit) and it is well received then why not consider submitting it as a case study for the journal or as a poster at Conference! Case discussions also give you a chance to ask for help with a difficult case, give the network an overview of the situation you are struggling with and the points you feel you need input on and let our network members use their experience and give you their suggestions, you never know the solution might be simpler than you imagine!

Discussions

This is the section for questions, answers, debate and interaction. The discussion forums give network members a chance to ask the questions on their mind and benefit from the combined expertise of the group. There have been questions on all sorts of topics: from the search for a particular walking aid or piece of equipment to career progression queries and professional issues. This section is often where requests for participation in various groups, studies or research may appear and is a great place to chat through whatever amputee related topic is on your mind. However this is only effective if members not only ask questions but also contribute to the topics already raised. As some topics raised in this section are from those outside amputee rehabilitation posts such as students or physios working in other specialities, we need our members to share their knowledge and experience in these discussions so those with less experience or those looking to get into this area of practice can be supported and advised appropriately.

Other Features

There is also the opportunity to post and view videos, journal content and share useful websites. These can be submitted and will be reviewed by the facilitators before they are available to view by the network members as for other types of content.

The iCSP bulletin, which arrives in your inbox each fortnight, is generated from all the content posted on iCSP over that 2 week period as well as any particular item or issue that I have been made aware is important to disseminate. The bulletin can be edited to include news, reminders and other messages that are important for all of the network members to see, BACPAR members included.

All of these features are there for you to use as a member of iCSP but they will only benefit our amputee rehabilitation community if they are made use of. As a committee we are aware that there are various other options out there for online discussion and sharing practice and will be looking at these but iCSP is an important part of our Professional Network and its impact within the profession so it is important that our members are behind it and support its use. If you have any views, feedback or suggestions about how we can make the most of our iCSP network then please feel free to get in touch:
bacpar.icspfacilitator@gmail.com

BACPAR CONFERENCE SUMMARY

Maria Andrews

Specialist Amputee Physiotherapist

Bowley Close Rehabilitation Centre, Guy's and St Thomas' NHS Foundation Trust

The BACPAR Conference 2016 "Supporting the Challenging Patient" was held in November at a Convention Centre in Liverpool. It was a great centre with lovely views of the docks. The ER-WCPT (the European Region of the World Confederation of Physical Therapy) European Congress was also taking place in the same venue, which allowed BACPAR delegates to attend this event afterwards if they wished.

After a welcome speech by Julia Earle – Chair of BACPAR, the conference commenced with Lynzy Holding – Prosthetist at Steeper, presenting a case study on Bikini Style Sockets for hip disarticulations. She highlighted that these sockets were supportive throughout the gait cycle, are lighter and more cosmetically pleasing and can improve patients comfort and donning. I have already discussed the potential of this being used with one of our patients at Bowley Close!

Helen Scott – Clinical Lead Physiotherapist at Westmarc, Glasgow, followed on with the hip disarticulation theme and presented a great summary of the rehabilitation needs of these patients. It was broken down into pre and post amputation rehab, leading onto prosthetic rehab. The presentation reinforced the need to really understand the prosthetic components that you are working with, to provide effective rehabilitation.

Next to present was Jennifer Fulton – Physiotherapy Clinical Specialist at RNOH, Stanmore. Jennifer delivered a very interesting presentation on ITAP Direct Skeletal Fixation of Prosthetic Limbs. It started with an introduction to ITAP (Intraosseous Transcutaneous Amputation Prosthesis) and went on to discuss the clinical research trial, including stages of rehab, challenges and case studies. The trial has now finished and I am looking forward to reading it when published.

Kate Primett – Clinical Lead Vascular and Amputee Therapies at Royal Free, presented another exciting clinical trial – "Pressures Exerted on the Amputees Remaining Limb (PEARL Clinical Trial)". The main objective of the trial is to establish if the overall pressure distribution differs on the remaining foot when an amputee is wearing an early walking aid, compared to a made-to measure prosthesis? Kate took us through the objectives, methodology, results to date and learning outcomes so far. I wish Kate the best with completing the trial and am sure that it will aid clinical decision making in the future.

It was then time for refreshments and to visit the stands of the companies who had sponsored the conference. It was good to see their products and I even managed to come away with some black pens and a goniometer!

Next to present were **Dr Natalie Vanicek – Reader in Clinical Biomechanics** at University of Hull and **Zoe Schafer – PHD Student** at the same University. They presented their study "To evaluate the effects of an individualised exercise programme on functional performance measures in a group of community-dwelling lower limb amputees". It was a detailed account of the methodology and results and concluded with various positive findings including, that falls were reduced and improvements were made with patients' gait and walking tests.

The AGM then took place and led us up to lunchtime. The lunch break enabled delegates to look at the poster exhibition and mingle again with both delegates and the sponsor companies.

Opening the afternoon session and focussing on the psychological aspects of amputation, **Candy Bamford – Counselling Psychologist** at Lancashire Teaching Hospitals NHS Foundation Trust, delivered a captivating presentation (just what was needed after a lovely lunch!). It outlined the emotional barriers that patients may have to overcome post amputation and during prosthetic rehab. Candy also discussed the principles and benefits of Counselling, Hypnosis and EMDR.

A technical and informative presentation on the "Non-diabetic Biomechanical Treatment of the Remaining Foot" was then given by **Bill Law – Clinical Lead Podiatrist Biomechanics** at the Royal Wolverhampton NHS Trust. The presentation explained foot biomechanics, including potential problems at various joints and treatment options. Bill reinforced the need to involve Podiatry teams when required, to optimise patients rehab.

Next to present was **Gayle Arthur – Prosthetist** at Steeper. She led an open discussion between the delegates regarding Stubbies use within the civilian population. Through the use of case studies, various aspects of bilateral transfemoral rehab were presented and discussed within the room. It was interesting to hear clinicians different approaches, a thought provoking session.

Also from Steeper, Clinical Support Specialist Tim Verrall was next to speak.
He gave an informative presentation regarding Transtibial Total Surface
Bearing sockets.

The management of scarring on a residual limb was then presented by **Kate Sherman – Clinical Lead Physiotherapist (Complex Trauma)** at DMRC Headley Court. The session was extremely useful with regards to improving assessment skills and highlighting management/treatment options. Kate also discussed prosthetic considerations and medical developments within this field.

Continuing with scar management, **Adam Withey – Sales Director** at Juzo UK Ltd, briefly discussed wound healing and the formation of scars, which was a useful recap. He finished by reviewing treatment options including, compression, silicon pads and massage.

The last two sessions of the afternoon focussed on ageing, very relevant to the amputee population and the conference theme. **Louise McGregor – Physiotherapist and AGILE Chair** discussed the various effects that occur to the body as we age. Louise valuably linked these factors to the rehabilitation process and highlighted the clinical implications.

Rachel Neilson – Academy Prosthetist at Ottobock then delivered the final presentation of the day, called "Prosthetic Limb Wearing in an Ageing population". The take home message was that older amputees are likely to have more complex needs and require a holistic MDT approach for successful prosthetic rehabilitation.

Thank you BACPAR committee, the speakers and sponsors for a great day.
Our challenging patients will now be a little less challenging!

Rehabilitation outcomes after lower limb amputation in Scotland:

all aetiologies other than PAD and/or diabetes

Joanne Hebenton, Specialist Physiotherapist, Helen Scott, Team Lead Physiotherapist.
WestMARC, Queen Elizabeth University Hospital, Glasgow

Introduction

The Scottish Physiotherapy Amputee Research Group (SPARG) runs a national audit project that reports the demographic profile, rehabilitation milestones and outcomes of all new lower limb amputees (LLA) in Scotland. Historically, all aetiologies have been grouped together for analysis and reporting. However, as 85% of new LLA are due to Peripheral Arterial Disease (PAD) +/- diabetes (Scott et al 2016) the outcomes are strongly influenced by this patient group, who are generally older and less active, with multiple co morbidities.

The largest subgroup, orthopaedic (osteomyelitis, non union fracture, failed joint replacement and acquired deformity) was created to facilitate data collection but restricts interpretation, particularly when considering outcomes after failed joint replacement.

Aim

1. To determine the rehabilitation milestones and outcomes following LLA for aetiology other than PAD+/- diabetes
2. To ascertain accurate diagnosis within the orthopaedic category and explore milestones and outcomes.

Method

Part 1 - analyse 3 years of SPARG data (2011 – 2013).

Data for all new LLAs in Scotland, from 1st January 2011 until the 31st December 2013, was extracted from the SPARG data base, collated and cleaned. The outcomes and milestones included in the table below were identified for all amputations irrespective of aetiology and a comparison between the total group and all individual aetiologies was carried out.

All patients	
Gross outcomes: recorded at final discharge Limb fitted, non limb fitted, abandoned limb fitting or deceased	
Limb fitted patients	
Days to compression therapy *	Days to early walking aid *
Days to casting *	Days to final discharge *
Locomotor Capability Index - 5 (LCI) self reported mobility. 6 months pre amputation, at discharge from physiotherapy treatment and the change between the two.	

* median days from surgery

Part 2 – follow up of the orthopaedic cohort in Greater Glasgow and Clyde (GG&C)

Twenty seven patients were identified as having had their surgery in GG&C for orthopaedic reasons and accurate diagnosis was ascertained from their medical notes, found on Clinical Portal.

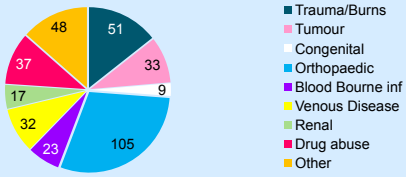
Following this they were divided into 6 sub categories depending on their diagnosis.

Milestones and outcomes were then re analysed within these sub categories.

Results

Part 1: There were 2317 amputations in Scotland between 2011 and 2013, of these 355 had aetiologies other than PAD+/- diabetes.

These aetiologies are identified in the chart below.

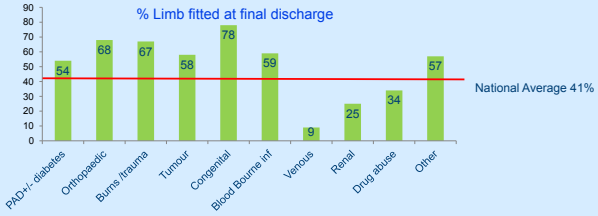


Demographics	All aetiologies	PAD +/- diabetes	Non PAD+/- diabetes including orthopaedic	Orthopaedic
Number of amputations(%)	2317 (100%)	1953 (85%)	355 (15%)	105 (5%)
Median age	70 years	72 years	57 years	60 years
% male	66%	64%	62%	63%
Functional co-morbidity index (FCI)	3	3	1	2
% at transtibial level	55%	56%	53%	53%
% bilateral	5%	5%	5%	0%

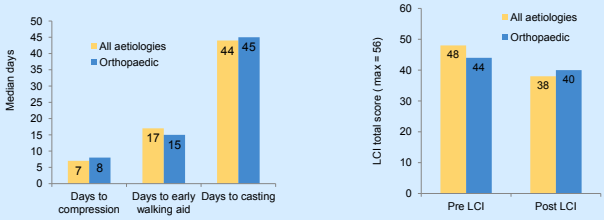
Results *continued*

The non PAD+/-diabetic group are younger, with a lower FCI and there were no bilateral amputations in the orthopaedic category.

There is a wide variation in the number of patients recorded as limb fitted at final discharge, this can be seen in the table below.



Time to achieve rehabilitation proved to be similar when the results for the orthopaedic subgroup were compared to the total group. However, compared to the total group, the orthopaedic category reported that they were less mobile before amputation and more mobile after.



Part 2: Outcomes were re-analysed in sub categories for the orthopaedic GG&C cohort, the results can be seen in the table below.

Sub categories	N = 27 *	% transtibial	% limb fitted (at final discharge)
Osteomyelitis	5	80%	80%
Non Union fracture	5	80%	80%
Failed joint replacement	6	0%	83%
Acquired deformity	4	75%	75%
CRPS	2	100%	100%
Other	3	66%	33%

* 2 missing data sets

When divided into sub categories the numbers in the Glasgow cohort were too small to analyse the time to achieve milestones.

Conclusion

There is wide variation in the percentage of patients limb fitted at final discharge across the aetiologies. The orthopaedic category has one of the highest rates of patients limb fitted; in contrast to those in the categories of renal failure, venous disease and drug abuse whose rates were lower than the national average.

Patients in the orthopaedic category were younger with predominantly chronic conditions. Predictably, these patients were less mobile than the whole group before surgery but achieved a better level of mobility after prosthetic fitting. There was little difference in the time to achieve their rehabilitation milestones.

The numbers in the Glasgow cohort were too small to draw any significant conclusion regarding timing of rehabilitation, within the sub categories (Part 2). Closer examination found that those in the orthopaedic category were living with chronic conditions.

Acknowledgements

This project was funded by British Association of Chartered Physiotherapists in Amputee Rehabilitation (BACPAR)

References

Scott H, Patel R and Hebenton J (2016) 'A Survey of the Lower Limb Amputee population in Scotland 2013' http://www.knowledge.scot.nhs./sparg.aspx

Contact details: joanne.hebenton@ggc.scot.nhs.uk

CPD REFLECTION

BACPAR CONFERENCE NOVEMBER 2016

Carolyn Hirons

Clinical Specialist at Pace Rehabilitation

The BACPAR conference and AGM in 2016 took us to the Liverpool Arena & Convention Centre at Albert Docks. On November 10th, for the first time the BACPAR conference preceded the ER-WCPT Congress held on the 11th and 12th of November, allowing the opportunity to attend both.
The theme was "Supporting the Challenging Patient", aimed to develop the delegate's skills and knowledge for the management of the individual that has undergone amputation and presents with additional problems.

The programme, as ever, was wide and varied, where speakers shared their clinical experiences and findings with the audience, generating exchange and debate. The presentations can be found on the BACPAR website: **bacpar.csp.org.uk/bacpar-2016-conference-agm-supporting-challenging-patient**

Having reflected upon my attendance at the conference, this article summarises the learning outcomes that I identified to apply to my clinical practice. This was a very useful exercise post conference, especially as I have twice been selected by HCPC to prove me CPD for registration.

Physiotherapy for people with hip dislocation patients by Helen Scott

- Hemipelvectomy term is known as 'transpelvis'
- The common compensations during walking are posterior tilt of the pelvis to initiate swing and to vault on the sound leg to create forward propulsion. Due to the musculoskeletal deficit, these are difficult to correct and therefore should be managed by spinal and calf stretches rather than corrected.
- Exercise needs to address trunk dissociation and strengthening of the remaining leg and upper limbs for crutch use.
- An orthotic sitting cushion may be necessary.
- Custom made compression garment, may especially help with phantom limb pain. This also will help to contain soft tissue, which helps with bladder and bowel control.
- Training tips include: posterior tilting, resisted walking with Theraband. The prosthetist will advise on how to release the prosthetic hip and knee for sitting from standing. This needs lots of practise.

Pressure Exerted on the Amputees Remaining Limb (PEARL Trial) by Kate Primett

- There is a need to be mindful of the pressures being exerted on the remaining foot of people with peripheral arterial disease and diabetes whilst using early walking aids.
- Footwear with inbuilt insoles can alert the wearer when peak pressures are too high.

Psychology to achieve a positive outcome by Candy Bamford

- Peak times for counselling include at first discharge, when reality of being at home and how different life now is, and when receive the first prosthesis, when expectations might not be met by patient, family or staff.
- Motivator's can be positive, where are you heading, or negative 'what happens if you don't achieve?
- Becoming an established prosthetic limb wearer includes returning to work, recreation and hobbies, returning to relationship dynamics and accepting/ adjusting to the change. It is important to aim towards these goals.

• An excellent book reference is 'Phantom's in the brain' by Ramachandra IBN 1-85702-895-3

• Candy talked about the unconscious mind and the benefits of hypnotherapy and relaxation. The positive affirmation improves sleep, reduces blood pressure, anxiety and depression, and improves the regulation of the immune system.

• The homunculus – pain moves nearer to the remaining distal anatomy.

• Hypnotherapy calms the nervous system. Mobilise the phantom limb using visualisation, which reinstates the area in the primary motor cortex and updates the body memory/image.

• Psychotherapy – ones upbringing dictates how many negative thoughts one has, a stable upbringing helps one to cope. Psychotherapy works on negative beliefs that are ingrained and moulds the ability to cope in adulthood.

Three reasons behind phantom limb pain:

• Nerve pain – including anxiety, infection and stress

• Body memory – feedback in the parietal lobes, need to replace this as the brain cant delete it

• Shooting pains – due to ne feedback from the primary cortex, no proprioception (movement, sensation or visual feedback)

It is possible to train in EMDR – see British Society of Clinical and Academic Hypnosis: **www.bscah.com**

Use of stubbie prostheses by Gayle Arthur

• Using stubbies opens activity doors for people and prepares them for longer prostheses if indicated.

• Use a buddy if the patient is reluctant to try stubbies. Needs psychological support for being 'short'. Use an OT to make them functional with the stubbies.

• Aim for use of stubbies 9-4pm daily prior to trying microprocessor knees

Indication criteria:

• Independent lying to sitting and transfers

• Hip flexion deformity less than 15 degrees - adequate hip ROM and strength

• Medically fit enough

• Strong core stability

• Adequate cognition using mini mental test

• Realistic goals and motivation

Useful article: **oandp.org/AcademyTODAY/2009Mar/2.asp**

Managing scar tissue by Kate Sherman and Adam Withy

• Areas to address are pressure tolerance, smoking and psychological appearance.

• Most scars mature over 7 months. Steroid injections help with thick scarring.

Treatment approaches:

• Moisturise

• Use silicon gel sheets and gel layers – nourishes the scar, stops it drying out.

• Prosthetic liners essential rather than sock fit

• Soft tissue massage – influence surface, deep and fascial planes, breaks down the fibrosed tissue

• Exercise – use stretching and strengthening if scars are near joints

• Use heat and ice for pain

• Use compression garments and splinting

• Patient self management – massage, skin care sun protection, monitoring and silicon application.

Useful adjuncts:

• **www.jobskin.co.uk**

• Otoform – malleable silicon putty that sets, apply under liner in creases and folds, and then cast over this. **www.algeos.com/otoform-k2.html**

• Choose liners without or without tension – depending on whether scar is mobile or not.

• British Burns association have good National Burn Care Standards.

• Scar pads under compression will last 2-4 weeks **www.juzo.com/uk/products/accessories/care-cleaning-and-accessories/juzo-scarpad/**

• Some Juzo shrinkers have UV80 protection.

The Effects of Ageing by Louise Mc Gregor

- Normal ageing – all systems deteriorate due to genetics and lifestyle, socioeconomic and environmental influences. Most people start to slow aged 75 years.
- Disease is not inevitable but the risk increases the older you become.

Areas affected and the impact on patients that we treat:

- Vision – reduced night vision and visual acuity and contrast sensitivity.
- Hearing – lose high frequency tones and more wax.
- Sensory – reduced conductivity, tactility, joint position sense and sensation to heat.
- Skin – slower to heal, less subcutaneous fat and more sensitive.
- MSK – cartilage thins and connective tissue becomes rigid.
- Bone – loss of bone mass, especially in women.
- Muscles – reduced number of fibres, loss of motor units, fast fibres atrophy, slower to contract, less excitable and elastic, easier to fatigue. BUT exercise can improve the situation and is essential, 150 minutes a week. A test of strength is being able to stand from sitting without chair arms.
- Cardiac – maximum heart rate reduces (220-age = max heart rate).
- Vascular – increased blood pressure.
- Respiratory – cough reflex blunted, alveoli less elastic, chest wall stiffens and respiratory muscles weaken.
- Central nervous system – volume of brain reduces by 5% every decade after 40 years old, slower neuronal transmission, mild memory issues and reduced reaction times.
- Function – work harder to maintain same activity levels.

Although making this list made me feel somewhat dishearted, I do enjoy saying to older patients 'you can teach an old dog new tricks, it just takes longer'. I also came across another encouraging phrase this week – 'don't wish for it, work for it'.

Acknowledgments

Thank you to Bacpar for an educational bursary that contributed to my attendance at conference in 2015. I would encourage all Bacpar members to use this valuable resource.

The Royal Wolverhampton NHS Trust

Early Outcomes of the Implementation of Physiotherapist Independent Prescribing in a Specialist Rehabilitation Service for Persons with Lower Limb Amputation

Louise Tisdale, Amputee Rehabilitation, Royal Wolverhampton Trust, United Kingdom. louise.tisdale@nhs.net

Background

Following campaigning by the Chartered Society of Physiotherapy to increase prescribing rights for Physiotherapists (PT), Independent Prescribing (IP) rights were given to Physiotherapists in England in 2013, with appropriate training made available at the beginning of 2014.

The development of Physiotherapist Independent Prescribing has been a positive step for Physiotherapy and those receiving Physiotherapy treatment. This poster will aim to demonstrate the outcomes of the new Physiotherapy practice developed within a Specialist Rehabilitation service for persons with lower limb amputation.

Aims of the new practice

- To widen the range of treatment options available to the PT following assessment
- To avoid a delay in the access to or change in medication needed
- To maximise patient's rehabilitation potential and maintain quality of life once achieved
- To improve the use of the Consultant's time in the weekly clinic
- To safely improve clinical effectiveness and patient satisfaction

Evaluation

Having gained dual qualification as an IP and Supplementary Prescriber (SP) in June 2015. Prescribing practice was commenced in January 2016. Medication choice for the initial formulary was based on the outcome of reviews of NICE guidance, where available, for the management of hyperhidrosis, musculoskeletal and neuropathic pain, or based upon knowledge gained through experience in the Prescribing Preparation time. Prescribing decisions are documented and reviewed with the supervising Consultant. Outcomes of prescribing are reviewed and feedback gained from patients in receipt of this change in service delivery.

The initial formulary

An initial formulary was developed for implementation of IP by the PT and is shown in the table. Items followed by SP require inclusion in a Clinical Management Plan to enable the PT to prescribe it.

Paracetamol	Ibuprofen
Gabapentin	Duloxetine
Pregabalin	Lidocaine Patches
Amitriptyline	Aluminium Salts
Codeine Phosphate (SP)	Emollient with Antimicrobial (Dermol 500)

Results

All new patients referred to the Amputee Rehabilitation service in Wolverhampton (both pre amputation and post operatively) and assessed by the IP PT are reviewed re the management of their pain. Patients' residual limbs are also assessed in respect of their skin integrity. Established patients are also reviewed at the request of the Prosthetist or self-referral.

Following a review of prescriptions written and medication review related activities in the prescribing diary, the following summary table was developed. In addition to activity described in the next column, where appropriate, each patient assessed received advice re medication use to enable effective use of the same.

Reason for review	Prescription provided (N)	Change in dose of prescribed medication (N)	Patient requiring Consultant review for same problem
Phantom Limb Pain	1	10	
Residual limb pain		1	1#
Other pain		1	
Dermatological problems	9		

CMP prepared for management of residual limb pain in case of need to prescribe Tramadol Hydrochloride

Safety

- There have been no medication related clinical incidents or adverse events.
- There have been no Pharmacist queries regarding prescriptions written

CPD

- The PT has received ongoing mentorship from the Consultant.
- The PT has attended a Non-Medical Prescribing (NMP) update
- The PT has presented at a NMP update
- The PT monitors the relevant formularies and NICE guidance for relevant updates.

Feedback from stakeholders re the PT IP function against the aims of the new practice

"more than one IP in a small team means the patient is not affected by Consultant leave and limited input (1 x weekly clinic) gives flexibility to monitor treatment plan closely; good for patient; frees up GP and Consultant clinical time direct observation of response of pharmacological interventions on rehabilitation taking inter-disciplinary to trans-disciplinary rehabilitation " - Consultant in Rehabilitation Medicine

"the Physiotherapist is on site. She can observe patients regularly and prescribe immediately instead of waiting for an appointment" – RM - Transfemoral amputee

"allowing the Physiotherapist to prescribe medication is a necessity. No delay for the patient and less work for the Consultant. It was useful to me "– RD - bilateral Transtibial amputee

"having a prescription from the Physiotherapist has sped up the process of getting treatment and it was supported by the right information about how to use it" - KH- transtibial amputee

Conclusions

Early review of the outcomes of the new practice by the Specialist Physiotherapist demonstrate that this service development is a valuable addition to the role through improving the quality of the service. Practice is commensurate with the evidence base and found to be cost effective in terms of supporting patient´s compliance with the use of the prescribed medication and more efficient use of Consultant sessions for the service. Whilst the number of Physiotherapist IPs annotated on the hcpc register has grown steadily since the right was given, few are currently working in rehabilitation of those who have undergone limb amputation services. It is hoped that this review will act as a basis for the development of others in this specialist Physiotherapy role and the services they work within.

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East Kent Hospitals University NHS
NHS Foundation Trust

Challenges to Rehabilitation for Lower Limb Amputees with End Stage Kidney Disease

Fiona Gillow (Vascular Clinical Specialist Physiotherapist) and
Karen Jenkins (Renal Consultant Nurse) Kent and Canterbury Hospital

Background

There is a high prevalence of lower limb amputation in patients with end stage kidney disease (ESKD) ranging from 1.7% to 13.4% with diabetes being the leading risk factor[1]

A literature search revealed very little information on how best to rehabilitate patients with ESKD who undergo a lower limb amputation.

In order to develop greater skills and awareness for rehabilitating this group of patients a study day was planned with the following aim:

- To work as a group using a mixture of current literature, knowledge from expert speakers presentations and clinical experience to:
  - Identify challenges to rehabilitation
  - Suggest possible therapy solutions

Method

Study day attended by 18 delegates including a range of Physiotherapists, Occupational Therapists, Technical Instructors and a Physiotherapy Student all practicing within the fields of Amputee Rehabilitation or people with ESKD.

Expert speakers presented on ESKD, dialysis access, home therapies, haemodialysis, anaemia management, renal mineral bone disease, exercise for ESKD and use of a diabetic foot assessment tool.

An Interactive session reviewing selected articles from a literature search took place in small groups with regard to validity, results and usefulness, and participants fed back to the whole group

Following presentations and consideration of literature, attendees worked together in small groups addressing the aim of the day to develop a consensus for future management.

Outcomes

The literature search found 4 relevant articles to consider as part of the study day. [2,3,4,5]

The challenges and possible therapy solutions identified by the group are shown in Table 1.

In addition to the challenges identified, the group felt that attitudes and perceptions from non-renal staff at times created barriers to rehabilitation as they perceived them to be less likely to achieve their goals. However practice and literature do not support this perception. [2]

Table 1: The challenges and possible therapy solutions identified by the group are shown in the table below.

Common Themes	Challenges	Impact	Possible Therapy Solutions
Physical Problems / Symptom Management	Anaemia Symptoms	Fatigue Loss of energy Shortness of breath Poor concentration Dizziness	Pacing / energy conservation strategies Consideration over timing / length / frequency / location of therapy sessions
	Co-morbidities: •Cardiovascular disease •Peripheral arterial disease •Peripheral neuropathy	Restricted ability to exercise / participate in therapy Reduced motivation for therapy Effect on quality of life Risk to remaining limb	Awareness of possible co-morbidities Use of non-pharmacological pain relief techniques due to restrictions on nephrotoxic pain medications Therapist / Patient / Carer education regarding risks to the remaining limb
	Electrolyte Imbalances	Deranged levels of potassium, calcium, phosphate, magnesium and related symptoms	Therapist / Patient / Carer awareness and education of symptoms and impact Where appropriate check blood results
Constraints of Dialysis	Dialysis Access	Constraints of exercise with arterio-venous fistulas/grafts/central venous catheters/ peritoneal dialysis	Awareness of type of dialysis access and any restrictions it might cause
	Fluid Balance Variations	Peripheral or pulmonary oedema Dehydration	Awareness of any possible fluid restrictions Patient / carer education regarding adjusting number of socks with residual limb volume changes Timing measurements for prosthetics with maximal fluid balance
	Time	Restricted time available for therapy sessions	Co-ordination of therapy sessions around dialysis Exercise during dialysis
Psychological Issues	Impact on mental health	Depression Denial Loss of independence Isolation Anxiety	Awareness regarding impact of combined long-term condition and amputation Combined approach to patient care amongst multi-disciplinary team members especially ensuring referral to psychological support

Summary

Lower limb amputees with ESKD have additional challenges to rehabilitation but there are many possible ways therapists can help to provide solutions.

Recommendations for Practice

Therapists working with lower limb amputees who also have ESKD should have access to both Renal and Amputee specialist education.

Therapists need to establish good links amongst the multi-disciplinary team to ensure a combined approach when caring for lower limb amputees with ESKD.

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Acknowledgments to Contributors

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Thank you to Mark Kerr (Clinical Librarian EHKUFT) for completing the Literature Search.

We care

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REGIONAL BACPAR STUDY DAY

NORTH THAMES CLINICAL MANAGEMENT IN ACUTE AMPUTEE REHAB

Claire Stainton

Senior Vascular and Amputee Physiotherapist

On 3rd March 2017, the Royal Free Hospital hosted a BACPAR clinical management in acute amputee rehab study day. The event was hosted and facilitated by Catherine Wilkinson (Senior Vascular & Amputee Occupational Therapist) and Kate Primett (Clinical Lead Vascular & Amputee Therapies). It was a day of presentations and discussions with a variety of MDT members in the morning, followed by practical sessions in the afternoon with established amputee patients.

The morning started with Mr Jason Constantinou (Lead Vascular Surgeon) who gave an informative and interesting insight into surgical intervention, including the causes of amputation, investigations, preventative surgery and the various levels of amputation.

Richard Leigh (Lead Podiatrist) provided an in-depth and helpful presentation around podiatry involvement in the care of a diabetic foot which was followed by an interactive presentation by our Lead Tissue Viability Nurse Sarah Dionissiou, who discussed wound management following amputation. This included common wound types/complications and a discussion of the different types of dressings used with amputees.

Dr Emily Kenefik (Clinical Psychologist) presentation was centred on the common psychological needs in amputee patients, and how as therapists we can recognise and address these needs in order to help improve their mood, confidence and engagement in therapy.

The morning closed with an interesting presentation from our Lead Pain Management Nurse Anthony Grout who discussed different types of pain and commonly used treatments for post-amputee pain in order to help patients to engage in rehab, which we all agreed can be a huge barrier to rehab if not effectively managed. Following lunch Kate Primett and Catherine Wilkinson then provided an in-depth presentation and interactive discussion around the PT and OT roles in acute rehab, from the pre-operative stage all the way through to discharge planning and falls prevention. This was a great opportunity to learn and also share personal experiences/case studies with each other.

The afternoon was a jam-packed workshop consisting of 4 main practical stations:

- PPAM Aid (Senior Physiotherapist Claire Stainton) & Femurett (Senior Physio Hannah Read)
- Exercise Prescription (Kate Primett)
- Patient transfers & wheelchairs (Band 7 OT Sheena Cailey)
- Function in hospital and at home (Catherine Wilkinson)

There were several established amputee patients present who kindly gave up their afternoon to demonstrate rehab techniques at each station and model the use of specialist equipment such as the Early Walking Aids and Transfer Aids. They were also very happy to discuss with course attendees their experiences of the rehab process.

A wide variety of around 40 therapists attended the study day including therapy assistants, junior and senior occupational therapists and physiotherapists from a variety of Trusts around the country. It was a lovely opportunity to come together and gain a further insight into the multi-disciplinary management of acute amputee patients and share our experiences of working within this specialist patient group.

A huge thank you to the therapists who organised the event, the attendees, all of the speakers and patients who so kindly gave up their time to provide an interactive and informative study day!

Quotes from course feedback forms:

"Inviting actual patients to assist highlighted how effective OT/PT is to their independence!"

" I can't honestly fault the course, excellent afternoon and really enjoyed it!"

BOOK REVIEW

STUMPS AND CRANKS - AN INTRODUCTION TO AMPUTEE CYCLING

Author: Sonia Sanghani
Publisher: Meyer & Meyer Sport (UK) Ltd (11 Aug. 2016)
Language: English
ISBN-10: 1782550887
ISBN-13: 978-1782550884

I was given the opportunity to read prior to release Stumps and Cranks- An Introduction to Amputee Cycling. The book itself was written by an amputee who had realised that there were not many books available for amputees who wanted to cycle.

The book contains a compilation of stories and experiences from around 50 different amputees of different levels of cycling and locations around the world. It also contains informative information all about bikes, how to fix them, how to ride them and also about prosthetics.

I first started to read the book whilst away on holiday, the first chapter was very hard to get into, I felt it was very bitty and disjointed and therefore I could not get into the flow of reading it like other books. I struggled to find the relevance of some of the quotes to the principles of the book. The first chapter had 2 quotes from cyclists that I felt may be a little off putting for someone who is apprehensive about staring cycling after a recent amputation, many people are aware that they may have an accident on a bike however to be reminded of this in the first chapter may be a bit off putting. After a week's break and only 25 pages completed I pushed myself to read more.

Once into the second chapter the book started to flow more and I found the information more relevant and I felt myself wanting to read more and more. Reading the book from a professional background of a NHS prosthetist, I was a bit weary that this book was going to have stories of cyclist that have the best prosthetic devices available on the private market. However this book surprised me with stories and advice from people who cycled on with both top prosthetics but also standard prosthesis that would be readily available to people who would by this book.

The best chapter that I read in this book was the chapter on how to fall from a bike whilst wearing a prostheses. I found this very informative to read and would be very beneficial to both amputees and professionals working closely with amputees wanting to cycle.

Overall I felt this was a very comprehensive yet easily to read. I would highly recommend this book to amputees who are seriously considering taking up cycling. However for someone who is just wanting to cycle short casual distances then this book may be a bit expensive and informative. On the other hand this would be a very useful resource to be kept for professionals who work with amputees.

Freya Box

Prosthetist

Opcare Ltd, The Royal Wolverhampton NHS Trust, Maltings Mobility Centre

ADVANCES IN NHS PROSTHETIC PROVISION SPECIAL EDITION

2017 is an exciting and challenging time for prosthetic services in England. It sees implementation of the new NHS Prosthetic Policies for NHS funded Micro Processor Knees and Sports/Activity Limbs for children. Welcome to a Special Edition Insert dedicated to this topic with a summary of the policies, expert opinion, products available and more!

NHS England

CLINICAL COMMISSIONING POLICY: MICROPROCESSOR CONTROLLED PROSTHETIC KNEES

PUBLISHED: **12TH DECEMBER 2016**
REFERENCE: **NHS ENGLAND: 16061/P**

Summary
"This policy relates to the NHS providing a specific type of prosthetic knee called a 'microprocessor controlled prosthetic knee'. Microprocessor Controlled Prosthetic Knees are a group of knee components that can be a vital, necessary and important component to improve rehabilitation outcomes and quality of life. These limbs improve walking and balance by aiding walking movements in real time and this reduces falls and accidents caused by a lack of stability that can be experienced with other prosthetic limbs. The policy is based on published scientific research evidence.

• This evidence looked at the benefits and results of using these parts of the prosthesis

• The policy is to guide the rehabilitation multidisciplinary teams in order

• It is to make sure the right patients are selected for this prosthesis and highlight the prescribing pathway

• The policy outlines a unified approach to patient care at a national level. It aims to improve the level of services available to patients with limb loss in England

NHS England has reviewed the evidence and concludes that there is sufficient evidence to consider supporting routine commissioning of microprocessor limbs".

Criteria for commissioning MPKs are based on the evidence of their clinical efficacy and cost effectiveness summarised in Section 5 and 6 of the Policy.

To read the full policy including the inclusion and exlusion criteria and contraindications for MPK use please visit:
https://www.england.nhs.uk/wp-content/uploads/2016/12/clin-comm-pol-16061P.pdf

Contact Details for further information:
england.specialisedcommissioning@nhs.net

MICRO PROCESSOR KNEES

BACPAR EXECUTIVE COMMITTEE DISCUSSION AND ACTIONS

Amy Jones

Acting AHP Rehabilitation Consultant, Bowley Close Rehabilitation Centre, GSTT, on behalf of the Exec.

On Monday 13th March, as part if the 2 day executive committee meeting, we discussed the new MPK policy as set out by NHS England. After outlining how some of us are implementing the policy, we discussed some practical points as follows:

1. We agreed that we will create an MPK 'paperwork package', of common documents and outcome measures that can be accessed by our members via our website and or iCSP.

2. That there is a training need for physiotherapists based at prosthetic centres and satellite clinics, that should be run independently of the manufacturers.

3. We need clarity from NHS England on:

- **a.** Do all aspects of the Prosthetic Evaluation Questionnaire (PEQ) needs to be completed?
- **b.** Inform NHS E that outdoor mobility assessment is not always appropriate or able to be completed.
- **c.** How much detail do they want from the self reported falls diary?

We agreed that until we have clarity, all elements of the PEQ should be completed.

The policy states the need for timed walking tests (indoors and outdoors) but does not state which. We agreed that we can easily perform the 2 min timed walk but a 6 min timed walk will be more difficult to carry out.

For physiotherapists based at satellite clinics, implementing this policy is more onerous and we discussed that patients at satellite clinics may be asked to travel to their main prosthetics centre for assessment and initial set up and training.

There were differing thoughts regarding how to inform our patient group and how to manage our MPK waiting list on top of our normal service delivery.

We are at the very beginning of this process and collaborate working is essential. BACPAR would very much like a consistent approach to the use of outcome measures for ease of future analysis.

We will keep you updated via the website, iCSP and future journals.

Staffordshire and Stoke on Trent Partnership NHS Trust

Do MPK joints improve mobility and function of the less able amputee?

University of Southampton

What's the problem?

"Amputees seek prostheses that meet their functional needs to the fullest extent possible." [2]

Patients who have lost their leg above the knee require a knee joint in order to walk with a prosthesis. Research has shown that Microprocessor Controlled Knees (MPK) can have a positive effect on mobility and function. [1-3]

NHS England have recently commissioned a policy called 'Microprocessor Controlled Prosthetic Knees' for the issue of MPK joints to patients through the NHS.

Patients at Medicare Functional Classification Level (MFCL) K2 do not meet the inclusion criteria, but a proportion of this group of patients have been shown to have improved function and mobility when using MPK. [1-3]

Would a review of the inclusion criteria therefore allow more patients the chance to meet their functional needs and reach their full potential using a prosthesis?

The question

Should amputees who currently function at the MFCL K2 have access to MPK under NHS England's 'Microprocessor Controlled Prosthetic Knees' policy?

How do you assess this?

To prove MPK benefit MFCL K2 level amputees, the direct comparison of MPK and mechanical knee joints is required.

Study design
- Pre-test, post-test study design [1,2]
  - Directly relatable to clinical practice.
- Randomised crossover study design [3]
  - Allows for direct comparison of knee joints.

Outcomes measured
- Falls [2]
- Walking speeds [1,2]
- Stair decent [2]
- Participant knee preference [2]
- General activities of daily living (ADL) [3]
  - AS1 – Standing activities
  - AS2 – Activities requiring standing up and sitting down
  - AS3 – Activities heavily reliant on participants prosthesis related skills
- Participant K level with mechanical knee joint and MPK [2]

Author: Jason Robinson MSc MCSP

References
1. [illegible]
2. [illegible]
3. [illegible]

Examples of microprocessor knee joints

Ottobock's C-Leg

Ossur's Rheo Knee

Endolites's Orion Knee

What the research shows

Table 1: Comparison of research outcomes on K2 level amputees using a mechanical knee joint and MPK equipped prosthesis

Outcome	Mechanical knee	MPK	Difference
Falls [2]	3 (+/- 3)	1 (+/- 2)	64% reduction with MPK
Walking speed (m/s) [1]	0.55 (+/- 0.17)	0.66 (+/- 0.20)	20% improvement with MPK
Self selected walking speed over 75m (s) [2]	101.3 (+/- 47.8)	86.4 (+/- 32.8)	15% improvement with MPK
Stair decent (step over step) [2]	2 improved	12 improved	63% of subjects improved with MPK
Knee preference [2]	5 participants	14 participants	74% of subjects preferred MPK
ADL [3]	Baseline measure	AS1 – All subgroups improved AS2 – High and intermediate subgroup improved AS3 – High subgroup improved	High and intermediate subgroup performed significantly better using MPK
K Level [2]	9 subject at K2 level	4 of 9 progressed to K3 level	47% improvement in K level with MPK

What does it mean?

Findings demonstrates an improvement in functional ambulation ability of MFCL K2 level patients when using an MPK [1-3]. Interestingly it was identified that 47% of MFCL K2 level subjects improved to unlimited community ambulation (MFCL K3) when using an MPK [3].

The 64% reduction in falls [2] experienced by participants whilst mobilising with an MPK can increase patient confidence, which can have a positive impact on overall function with the prosthesis.

Improvements in ambulatory ability were seen with as little as 1 week [3] of accommodation in MFCL K2 level amputees, which is much less that the minimum 4 weeks trial of MPK joints stated in the policy.

Three subgroups identified within the K2 level group of amputees [3], highlights that not all MFCL K2 level amputees would benefit from an MPK.

Increased patient independence and function has the potential to save the NHS money as patients' move into later life. Reduced falls, hospital admissions and need for assistance are a few of the benefits of improved patient independence and function.

Moving forward

- Identifying the intermediate and higher functioning subgroups of MFCL K2 level patients would be important for successful MPK prescription.
- Review of criteria to ensure all suitable patients are identified for MPK use.
- Training in various MPKs for NHS physiotherapists involved in training patients.
- Initial cost of the MPK will be offset by reductions in NHS spending in patient's later life.

A REHAB CONSULTANT'S INPUT

Imad Sedki

Rehabilitation Consultant

Stanmore and Luton & Dunstable Prosthestics Service

"This won't take long?" went through my mind as I clicked enter, prompting Google to list the search results for peer-reviewed published evidence relating to MPKs. As the screen started showing page after page of titles, my eyes quickly wondered towards the kettle as I realised the need for a "Grande" caffeine fix to fuel the first MPK late night of many to follow.

The myth of lack of evidence was clearly busted with many clear benefits proven by experimental research. I took the results to my colleagues at the Inter Regional Prosthetic Audit Group where clinicians from several Limb Centres in the South East of England meet regularly to discuss clinical audit, and occasionally dabble in joint research work. We decided to work on producing our own regional prescribing guidelines for MPKs, which were eventually published in the International Journal of Prosthetics and Orthotics. Around the same time, NHS England replaced Primary Care Trusts as the main commissioning body for prosthetic services in England, and quickly sprung into action to form several working groups tasked to create several national policies for prosthetics. I was asked to form the MPK working group to include NHS clinicians representing members of the multidisciplinary rehabilitation teams in addition to a user group representative. We also included clinicians from the Defence Military Rehabilitation Centre at Headley Court were MPKs were already being provided to military amputees.

We had to start from the very basics as we didn't even have a definition of what constitutes an MPK. It quickly became apparent that our main challenge would be to bridge the gap between our very high aspirations and the reality of the limited available funding. After a few initial "stumbles", we realised that at the launch of the policy we can only afford to upgrade those who need an MPK as opposed to the much larger number of amputees who would benefit from using one. Once the high priority prosthetic users are upgraded, the policy could then be revised to be more inclusive.

The policy specified the main selection criteria based on mobility grade SIGAM D and activity level K 3. This is due to the strength of published evidence in support of the significant impact on highly active users. Increasing benefits along with reducing MPK costs is rapidly improving their cost effectiveness in view of the technological advancements in new MPK models. Furthermore there is a growing body of evidence highlighting the gains for lower activity users (who represent the majority of above knee amputee). This will hopefully shift the health economics balance in the users favour and support the future inclusion of lower activity users.

The indications had to be limited in the policy due to the need to be linked to strong published evidence. In the earlier drafts of the policy, the indications were more inclusive with a focus on the expected positive impact on the contralateral sound limb and the reduction of wear and tear. There was also a distinction between bilateral and unilateral amputees in terms of selection criteria. These had to be abandoned in the final draft, as the indications did not match the published evidence at the time.

Therefore, the main indications at this stage mainly relate to reducing the risk of stumbles or falls and the improvement in energy requirements. It is recognized that most amputees will require less energy when walking with an MPK compared to a mechanical prosthetic knee. However, this improvement needs to be considered in relation to clear functional or vocational goals that are agreed with the user during the initial selection stage.

The policy highlights the importance of a 4-week trial to confirm the benefits of the selected MPK, and compare outcomes with the patient's mechanical knee. It is acknowledged that conducting these trials is a labour intensive process adding to the workload of the already overstretched clinical teams. MPKs, however, should be considered as a long-term investment in our prosthetic users as they are expected to suffer less long-term problems and possibly require less clinical input over the lifetime of the component compared to mechanical knees.

Undoubtedly clinical teams will not have the capacity to upgrade all their users at once, and as a rough estimate, most centres would have a maximum capacity of two to three upgrades per month. This will create the need for clinically prioritised waiting lists within each centre to ensure fairness based on clinical need.

The implementation of the MPK Policy will hopefully be a step in the right direction for national service development. This is expected to boost the quality of life and health outcomes for many amputees, and the next revision of the policy is likely to be more inclusive in its selection criteria and indications. The purchasing power of the NHS is already promoting healthy competition and will continue to reduce MPK costs over the long term. The long-term outcomes of the current implementation combined with increased familiarity with MPKs will hopefully stimulate high quality research paving the way for further enhancements.

NHS ENGLAND

MPK FUNDING TO BENEFIT AMPUTEES

Alastair Ward

Training and Education Specialist, Blatchford

The NHS England Clinical Commissioning Policy for microprocessor controlled knees means that MPK's can now be prescribed to patients at specialist rehabilitation centres giving Prosthetists the opportunity to prescribe amputees with the best solutions the market has to offer.

Access to microprocessor-controlled knees will be hugely beneficial to those suffering with above knee and hip disarticulation amputations, particularly K3 walkers who face the potential of injury caused by falls and long term health issues associated with uneven weight distribution caused by lack of confidence with their current devices. Using current systems available on the NHS, amputees may often struggle to stand still as their knees have limited stability. The lack of trust in their prosthetic limb often means that the user will shift their weight on to the none-amputated limb, potentially causing serious problems for the amputee in the future.

Knee joints such as Blatchford's Orion 3 adapt hydraulic resistance in real time, providing the wearer with support when moving in any environment or standing still. This model also has stumble recovery technology, ensuring that the knee remains stable should the user falter. This reduces the risk of amputees falling or injuring themselves when walking or changing environments, and provides users with the confidence and stability needed to move without fear. Such benefits not only make a huge difference to patient safety and quality of life; they also reduce the lifelong care needs of amputees.

The decision to make microprocessor knees readily available to NHS patients will act as a catalyst to accelerate the development of even more advanced technologies to improve patients' lives further. Previously, the technology was only accessible to a small market, hindering developer's potential to grow and expand whilst also limiting the amount of user feedback and supporting research evidences available. Now that the treatment will be available on the Health Service, the amount of people who have access to these devices has suddenly become far broader. This will provide a much larger user group whose experiences and feedback can help to steer further future technological advances in this area.

It's refreshing to see that NHS patients will now have access to advanced microprocessor technology that is already widely available in other countries. In a world where technology continues to improve the lives of patients, it is a positive step to see NHS England harnessing what the market has to offer to benefit amputees, as well as investing in preventative measures to reduce the need for future treatments. This is a positive step forward for patients, the Health Service and the industry alike, that stands to only get better as the technology is developed further now it has at last become accessible.

For more information on Orion3 and free Orion3 training courses you can visit:
www.blatchford.co.uk

FREE Orion3 MPK Certification Courses

Courses are open for booking now. To book your training day please contact your local Blatchford Education and Training Representative;

Northern England & Scotland	Alastair Ward ✆ **07736 890151**
Midlands	Scott Kilby ✆ **07801 217219**
Southern England & Wales	Laura Ritchie ✆ **07770 843282**

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SUPPORTING THE CLINICAL TEAM

THROUGH THE PLIÉ 3 SELECTION, EVALUATION AND SET-UP PROCESS

Tim Verrall

Clinical Support Specialist

The UK government's decision to approve funding via the NHS for microprocessor knees means that hundreds of above knee amputees living in England could have access to a life changing prosthetic solution.

Whilst NHS England's heavily evidence-based approach to the prescription of MPK units ensures the optimal prosthetic provision for amputees, it requires extensive work by the clinical team during the application process.

The Plié 3 has been selected by NHS England as one of just four knees that can be considered for this area of NHS funding. With its high degree of safety and IP67 certification, this 'go anywhere' knee is suitable for use in a variety of environments, and with external charging and a battery life of over 24 hours, the patient can be ready for anything.

For MPK funding consideration, the Clinical Commissioning Policy states that patients must demonstrate 'cognitive reasoning to master control, operation and care of the device' [1]. To help with outcome measures and support the application of Plié 3, the cadence report provides quantifiable evidence of the patient's ability and improvement in their use of the knee, by allowing the prosthetist to access the patient's gait data at various stages in the evaluation process. Such evidence includes:

- A record of the number of steps per minute the patient was able to take at three different speeds – slow walking, normal walking and fast walking.
- Confirmation that the patient is capable of walking with variable cadence.
- A hard copy of the real time data for each walking speed.
- A printable PDF to support Plié 3 funding justification, especially when comparing Cadence Reports produced at the set up stage and after physiotherapy, and final customisation of the set up.

As it is possible to record real time data, this allows the clinical team to:

- View the real-time data recorded at the set-up stage.
- Analyse both the swing and stance phases of the gait.
- Identify gait anomalies by means of the Gait Lab contained in the software.
- Send the data files to Steeper for further analysis and assistance, if required.

In addition to assisting with the evidence based aspect of the application, the software also provides ease of set up, via the Set up Wizard, but still allows the knee to be fine-tuned to meet the patient's needs, or to accommodate certain activities. These settings can be saved for future reference or, should it be necessary, to load them onto another knee, saving valuable clinical time and repeated effort - something we would all be glad to benefit from.

Upon further examination of the policy, water related activities are listed as a contraindication for the MPK funding unless waterproof features are stated by the manufacturer - the Plié 3 therefore provides a further bene t to funding applications, by being completely submersible whilst remaining fully functional in water and protected from particles such as silt and sand with its IP67 certification.

Alongside these features, the Plié 3 o ers a number of additional bene ts to the clinician and the patient, including:

- Microprocessor control of the gait cycle with pneumatic swing and hydraulic stance phase adjustment available to both the clinician and the patient, provides a seamless transition from stance to swing, allowing increased safety and reliability at variable cadence - including at very slow speeds.
- Stumble recovery response within 10 milliseconds, providing exceptionally fast reaction to varying environments/terrains.
- Streamlined design for more aesthetically pleasing nish, with patient customisation through the option of a designer fairing.
- Short build height provides the advantage of increased space for the prosthetic foot component – enabling a wide selection of compatible prosthetic feet in a lightweight build.

In summary, as we are always striving to maximise e ciencies in our centres, the Plié 3 from Steeper provides the clinical team with many of the tools required to produce the evidence requested by NHS England for funding applications, quickly and easily.

For further details and extensive exploration of the clinical application of the Plié 3, a number of training sessions will be hosted at centres around the country over the next few months. For further details and additional support with Plié 3, visit: **www.steepergroup.com** or contact the Steeper Customer Services department.

[1] NHS England 16061/P. Clinical Commissioning Policy: Microprocessor controlled prosthetic knees. pp 19.

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Please contact marketingteam@steepergroup.com to register for the next Plié 3 training event around the country. To place an order for the Plié 3 MPK Package, contactcustomerservices@steepergroup.com or call 0113 270 4841.

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OTTOBOCK

SUPPORTING THE NEW MPK POLICY

Following on from the decision by NHS England to approve the funding of Microprocessor Controlled Knees (MPKs), patients previously restricted to mechanical knees will now have access to some of the most technologically advanced and life-changing prostheses in the world, including the trusted C-Leg. The most popular and clinically studied MPK on the market, the C-Leg adjusts itself dynamically to various everyday situations, providing the patient with peace of mind and security with every step.

In light of the MPK policy and the impact of a significantly larger workload on those who provide clinical services, physiotherapy and rehabilitation, Ottobock has developed a brand new concept known as OneFit, a more streamlined trial to order fitting process. OneFit is designed to make implementation of the NHS MPK Policy as easy as possible for clinicians and patients and consists of our OneFit Trial and OneFit Clinic.

OneFit Trial allows clinicians to simply select and order what they require for their patient and fit them immediately, reducing not only the number of clinical appointments required but also the time from trial to patients receiving their final prosthesis. If the trial is successful, the patient will be able to keep the C-Leg 4 used during the trial, reducing the potential safety risk of returning the user to their original limb during the transition period.

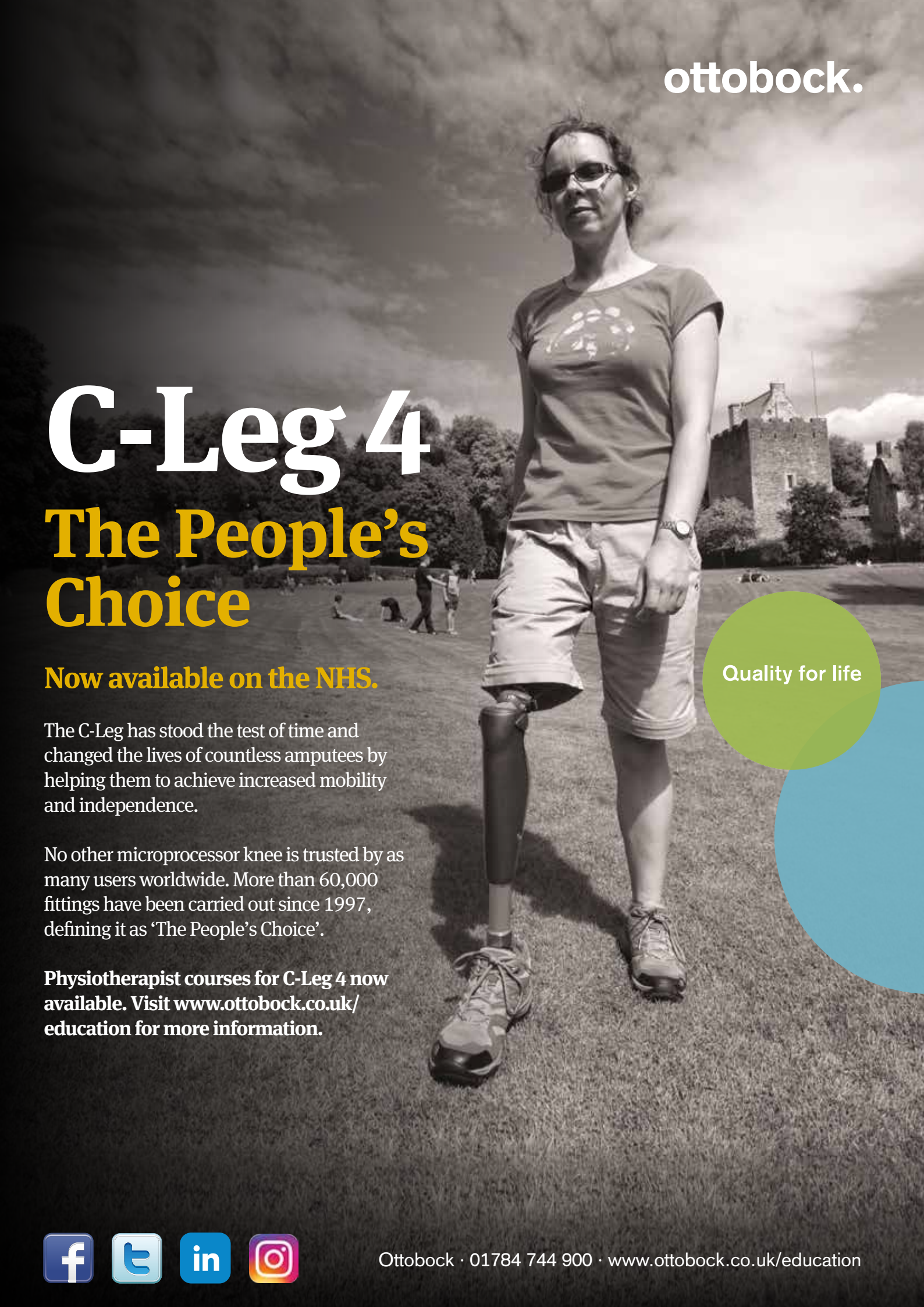
To further relieve the additional pressure, OneFit Clinics aim to provide all NHS centres with the practical support they need to implement the MPK policy. During a OneFit Clinic our Academy team will assist in the fitting of multiple MPK patients on the same day and be on hand to initiate immediate gait training with the centre's physiotherapy and rehabilitation team.

To complement the OneFit concept, Ottobock is offering dedicated training courses for physiotherapists, providing a complete overview of C-Leg functionality. These one-day courses are free to attend and provide the opportunity to learn a variety of training exercises, exhibiting how the features of the knee can benefit amputees.

To register for a course, or to find out more please contact: **academyportaluk@ottobock.com**

Ottobock physiotherapist courses

20 April 2017	Ottobock, 32 Parsonage Road, Egham, TW20 0LD
17 May 2017	Dorset Orthopaedic Midlands Clinic, Bretby Business Park, Ashby Road, Burton Upon Trent, DE15 0YZ
18 May 2017	Dorset Orthopaedic Midlands Clinic, Bretby Business Park, Ashby Road, Burton Upon Trent, DE15 0YZ
14 September 2017	Ottobock, 32 Parsonage Road, Egham, TW20 0LD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CHARACTERISTICS OF USERS WHO BENEFIT MOST FROM THEIR PROSTHESIS:

THE C-LEG OUTCOME PREDICTOR STUDY 2016

Parisa Norton, Malcom MacLachlan, David Gow, Lorraine Graham, Patricia Humphreys, Carolyn Wilson and Gavin Campbell

Executive Summary

Recent advances in prosthetic technologies have brought with them the potential for people to address physical impairments, allowing them to overcome activity restrictions and enhance their participation in a wide range of life's domains. Yet, there is variation in the extent to which the users of advances prosthetic devices derive such benefit from them; while for some the benefit is undoubtedly substantial, for others it may be minimal, or indeed, none at all.

Given the cost of increasingly sophisticated prosthetic technology, and the need to allocate scarce resources in an effective, ethical and evidence-based manner, it is important to establish the attributes of users who are likely to derive most benefit form 'high-tech' prosthetics, and to distinguish them from those who are likely to benefit equally well from other and less expensive types of prostheses.

This study sought to explore the experiences of users of the C-Leg prosthesis; through qualitative interviews, physical measures (the Six Minute Walking Test, Hours of Use of the prosthesis and the Socket Comfort Score) and a battery of psychometric measures: these included the Trinity Amputation and Prosthetic Experience Scales (TAPES), Coping Strategy Indicator (CSI), Cognitive Failures Questionnaire (CFQ), General Health Questionnaire (GHQ) and the Amputee Body Image Scale - Revised (ABIS-R).

Our 18 participants were 17 men and one woman, with an average age of 52. They were on average 23 years post unilateral above knee amputation and had on average used a C-Leg for almost 4 years. In six minutes participants walked a mean distance of 426 meters; and they reported wearing their prosthesis for an average of 12.38 hours (ranging from 6- 12.5 hours) per day. Their mean Socket Comfort Score was over 7, out of a possible maximum comfort of 10; and their Overall Satisfaction with the prosthesis was over 8, out of a possible maximum satisfaction of 10.

Interpretive Phenomenological Analysis was used to explore in depth qualitative interviews with seven C-Leg users. Emergent themes relating to the C-Leg included improved stability, better quality of life, the individual characteristics of users, their

recommendation of the C-Leg to other users, and their suggestions for improvements; particularly for recharging the battery of the prosthesis and for improving the socket-fit with the residual limb.

From the quantitative measures mean levels of satisfaction were high across the TAPES subscales. However, elevated scores on the ABIS-R reflected relatively high levels of dissatisfaction with body image. General mental health and cognitive failures were both within population norm levels, as were the coping strategies used by participants. We also conducted correlation and regression analysis to explore the strongest associations between variables of interest. Higher levels of Body Image dissatisfaction were associated with shorter walking distance and fewer hours wearing the C-Leg. Body Image was also associated with Overall Satisfaction with the C-Leg, as were several TAPES subscales, most strongly the Functional Adjustment subscale.

While older users walked less distance, age not associated with hours wearing, or satisfaction with the Prosthesis or Socket. The longer since their amputation participants reported using less avoidance as a coping strategy. Cognitive Failures were associated with a number of TAPES subscales, most strongly with General Adjustment, indicating that even normal variations in cognitive functioning may be relevant to use of a prosthesis.

Our sample was a small sample on which to conduct bivariate or multivariate analysis and so the findings must be interpreted with caution. Our sample of 18 participants was drawn from 42 C-Leg users attending a particular clinic, and so the representativeness of our participants, even from this one clinic, is unclear.

We conclude with 10 recommendations including the need for a larger-scale longitudinal study that could contribute to establishing guidelines for prosthetic prescription. Such a study should be conducted across a number of sites and countries, incorporating a range of prosthetic technologies. A study of this nature might be a contender for funding from the European Commission's Horizon 2020 programme; should a suitable Call be announced.

An intervention to promote positive body image post amputation may also be valuable. Although our present research should be regarded as provisional, it has indicated a number of possibilities for improving C-Leg use and highlighted a number of psychosocial variables that could be useful predictors of C-Leg outcomes.

Department of Health

CHILDREN'S ACTIVITY AND SPORTS PROSTHESES

Up to the end of March 2018, the Department of Health is making available a total of £750,000 to fund prostheses in England for children who have suffered limb loss or were born with a limb deficiency, to enable them to engage in physical activity and sports.

NHS Limb centres in England may request funds from the Department of Health for individual prostheses they have prescribed up to the value of £5000 per limb (not per child), including all the associated costs of fitting the new limb, such as a new socket or liner. For an individual prosthesis of greater value, they must apply for approval from an advisory group.

Eligibility criteria
Funding will be provided if the following criteria are met:

- The child or young person is under the age of 18 when assessed for their prosthesis.

- The child or young person has suffered limb loss or congenital limb deficiency. The prostheses can be for any limb (or limbs if the child has multiple limb loss or deficiency). Upper and lower limb components can be included.

- In the opinion of the clinicians in the Limb Centre, the child or young person is fit to engage in physical activity.

- In the opinion of the Limb Centre, the child or young person will benefit from the prosthesis, and from engaging in the physical activity.
Please note that the physical activity might include PE, sports or games at school, recreation, playing with friends or organised sporting activity.

- In the opinion of the Limb Centre, the prosthesis is appropriate for the child or young person, and the activity for which it is intended.

The Limb Centre – rather than the child or young person and their family – must be responsible for determining the appropriate prosthesis.
Components which are being used as part of a trial or to support a study will not be funded. Where possible a child or young person should trial the prosthesis.

- The Limb Centre is confident that there is a need for the prosthesis and that it will be used for more specialised activities (e.g. canoeing, rock climbing for example - there is a demonstrable interest in the sport, or a history of participation).

"I am determined that we do all we can to ensure children who have lost a limb experience full and active lives. So through the NHS, we are going to give £1.5million for new prosthetic to help amputee children run and jump when otherwise they have not been able to and build on the 2012 Paralympics legacy

This will mean a £500,000 fund to make sure 500 children get special sports prosthetics on the NHS, because too many aren't currently being offered what they need, like running blades or aqua limbs for swimming.

And we are going to give £1million to help the NHS develop the latest generation of prosthetics. This could include new breakthrough technology such as 3D printed limbs"

George Osborne

Ex-Chancellor of the Exchequer

15th March 2016

CHILDREN'S SPORTS PROSTHESIS PROVISION AT CRYSTAL PALACE

Amy Jones

Acting AHP Rehabilitation Consultant
Guys and St Thomas' NHS Trust

In March 2016, George Osborne announced in the budget that monies would be made available to fund sports prostheses in England for children who have suffered limb loss or were born with a limb deficiency, aiming to enable them to engage in physical activity and sports.

This was somewhat of a surprise announcement but eight months later, all prosthetics centres were contacted by the department of health confirming that a £750,000 budget was available for sports prostheses up to the value of £5000 per limb. The budget is available until March 2018 and children must be under the age of 18 at the time of assessment.

This is exciting news for our children and their families.

The eligibility criteria set by DoH are:

A. The child or young person has suffered limb loss or congenital limb deficiency. The prostheses can be for any limb (or limbs if the child has multiple limb loss or deficiency). Upper and lower limb components can be included.

B. In the opinion of the clinicians in the Limb Centre, the child or young person is fit to engage in physical activity.

C. In the opinion of the Limb Centre, the child or young person will benefit from the prosthesis, and from engaging in the physical activity.
(The physical activity might include PE, sports or games at school, recreation, playing with friends, organised sporting activity etc.)

D. In the opinion of the Limb Centre, the prosthesis is appropriate for the child or young person, and the activity for which it is intended.

E. The Limb Centre is confident that there is a need for the prosthesis and that it will be used for more specialised activities (e.g. canoeing, rock climbing for example - there is a demonstrable interest in the sport, or a history of participation).

The budget includes the components and all associated costs of fitting the new limb, eg new sockets and liners. Once assessed and the child meets the criteria, a trial can be carried out and the prosthesis provided. The 'P2' form is then submitted, informing the DOH what has been provided, to whom, the sports it is intended for, any outcome measures and it starts the invoicing process.

The DoH informed us that they will monitor the provision of these prostheses and therefore outcome measures and evidence is required, however, no guidance has been given.

If a particular component /limb costs more than £5000, an application can be made to the advisory group but this is done prior to a prosthesis being provided.

This budget does not include staff time for extra treatment sessions or components that are part of a research trial or study.

So what have we done at Guys and St Thomas' prosthetics Centre so far?

- We identified the children on our case load and in January, we wrote to their parents to inform them of the new budget, explain the criteria and invite them to make an appointment for assessment. We advised parents not to wait until 2018 to express an interest, as this will not give sufficient time to assess, trial and provide a sports prosthesis.

- Our prosthetists updated our MDT of components likely to be beneficial to our children and to consider which sports will align to each component, including upper limb.

- To date, 5 families have requested an MDT appointment, all have been assessed.

- 2 are waiting to have surgery, so we are waiting for confirmation on timelines for this to happen.

- 3 families have contacted us to inform us that they do not wish to be assessed.

An MDT Assessment is required for the children but we agreed that if a child had been reviewed within the past 6 months by the acting AHP Consultant (AHPC), then assessment by the therapists and prosthetists would suffice. We agreed that all lower limb patients will be assessed by physiotherapist, prosthetist and AHPC; upper limb patients will be assessed by occupational therapist, prosthetist and AHPC and multi limb loss by the entire team.

The levels of limb loss, prostheses provided or being considered of patients assessed to date, are as follows:

Level	Component issued or being considered	Sports Participation	Reasons
Bilateral KDA with trans radial	Flex run junior Recently prescribed a split hook – will review sports specific components in 6/12	Track athletics Gymnastics – asymmetric bars Swimming – out of pool strengthening training tennis, UL exercises – gym	Purely for running Multi use
Bilateral TTA	Mini Blade XT junior	School PE/games, football	Multi sport use, changing direction
PFFD	Blade XT adult - trial	School PE/games, football	Trial – will pt want a heel for multi sport use ?
Bilateral TTA	Variflex junior	School PE/games, playing in park & garden, cycling	Cosmesis is important to child and parents
PFFD	Mini Blade XT	Football	Needs a heel for football & changing directions. Wants 1 prosthesis that can be worn to school and used for walking and football.

We created an assessment form which includes:
Confirming that the criteria are met:
Height
Weight
Current sports/leisure participation
self reported limitations
Parental consent to video gait & running and photos
Document discussion regarding parental commitment to rehabilitation

Outcome measures and methods to review:
2 min timed walk
Timed running over set distance
Video of gait and running on current prostheses
Components prescribed to date

Other clinical questions we need to consider:
Do they want a sports prosthesis?
Is cosmesis important to child/family?
Can they cope with a sports specific limb or do they want 1 that they can do different sports in but can also wear walking to school etc?
Which components meet the child's needs?
For multi limb loss patients - upper limb Vs lower limb needs - which is the priority to begin working with?

We agreed that all children should be reviewed within 6 months, as per our usual policy for paediatrics, outcome measures and video footage will be repeated.

What does the future hold?
Whilst this is a very exciting development for the young amputees and children with limb deficiencies in England, we also need to be realistic regarding the long term funding issues for prosthetic departments when these young people become over the weight limit of the sports prostheses. Is it ethical not to provide a replacement? We have been very honest and upfront with our children and their parents regarding this issue.

Collaborative working and sharing experiences by prosthetic centre staff will allow for us to report on the national picture of our childrens' participation in sport and leisure activities in the future.

If you would like a copy of the assessment form we use, please contact: **amy.jones2@gstt.nhs.uk** or **nichola.carrington@gstt.nhs.uk**

SECONDARY CARE HOSPITAL REALITY IN REHABILITATION OF BILATERAL LOWER LIMB AMPUTEES

Coelho, A.[1]; Ladeira, A.[2]; Barradas, R.[1]; Pereira, I.[2]; Soares, M. J.[1]
Ribeiro, I.[2]; Carvalho, F.[2]; Barbeiro, C.[2]; Portugal, D.[2]; Ataide, S.[2]
[1] Physiotherapist; [2] Physiatrist

Clinical Director: Leonor Prates[2]
Hospital Professor Doutor Fernando da Fonseca, EPE, Rehabilitation Department, Amadora, Portugal

Introduction

Bilateral amputation is a challenge in rehabilitation, usually needing a more intense or prolonged period of rehabilitation. Goals of rehabilitation of these patients are usually related to their age, level of amputation, etiology of amputation/concurrent diseases and successful prosthetic use after first amputation.

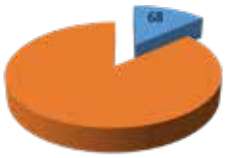
Hospital Professor Doutor Fernando da Fonseca:
-Secondary care hospital:
-Located on outskirts of Lisbon
-Serves a population of over 600.000 people
-Rehabilitation department since 1997

Protocol for lower limb amputees:
-Begins in surgical ward (pre/post amputation)
-Resumes as outpatient until:
-Successful adaption to prosthesis or
-Successful adaptation to wheelchair and education to family/caregivers.

Aims

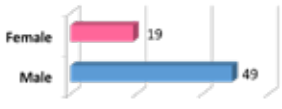
To assess the prevalence, characteristics and prosthetic use in bilateral lower limb amputees in a secondary care hospital.

Sample Characterization



Total: 501 patients
13,6% bilateral amputees

Bilateral lower limb amputees sample (n=68)



	Average (y)	+/-
Age	63,7	12,8

Methods

Retrospective and descriptive longitudinal study from the archives of clinical assessments of lower limb amputees evaluated and treated at our department from 1997 to 2015.

Statistical analysis was obtained using SPSS 19.0.

Quantification of bilateral amputees in total and analysis by:
-Gender;
-Age;
-Etiology of amputation;
-Level of amputation;
-Prosthetization process completed;
-Follow-up on prosthetized patients on ability to wear prosthesis and functional level (K-levels).

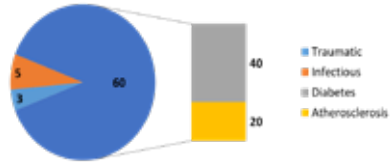
Results

From a total of 501 lower limb amputees treated in our department, 68 (13,6%) were bilateral lower limb amputees. They were predominantly male (72,1%) and with an average age of 63,7 years (±12,8) at the time of their admission for treatments. Etiology of amputation was predominantly vascular (40 secondary to diabetes and 20 to atherosclerosis) followed by infectious (5 patients) and traumatic (3 patients).

In this sample, 22 amputees had bilateral transtibial amputation, 17 bilateral transfemoral, 17 transtibial and transfemoral, 9 partial foot and transtibial, 2 partial foot and transfemoral amputation and 1 had bilateral knee disarticulation.

From all the bilateral lower limb amputees 42,6% were prosthetized. Excluding the single case of knee disarticulation (which was able to be adapted to prosthesis), patients with lower amputations were more frequently able to reach prosthetic use than the ones with higher amputation (78% of partial foot and transtibial amputation vs 18% of bilateral transfemoral amputation).

Etiology of amputation:



Follow-up on patients adapted to prosthesis (n=29)

Current status	n	Etiology	Level
Deceased	17		
Unknown status	5		
K0	3	2 Diabetic; 1 Traumatic	1 TF+Foot; 1 Bilateral TT 1 Bilateral Knee Disart.
K1	1	Diabetic	Bilateral TT
K2	2	2 Infectious	2 Bilateral TT
K3	1	Infectious	Bilateral TT

Conclusions

Being a secondary hospital, with no trauma center, peripheral vascular disease is by far the main etiology for amputation (~90%)

Most of bilateral lower limb amputees don't gather the necessary conditions to adapt to prosthesis

Lower level of amputation have better chances of successful adaptation to prosthesis use

Even the patients adapted to prosthesis, who would theoretically have better health condition, have very high mortality rate and the most functional ones are of non vascular etiology and lower levels of amputation

The slightly lower prosthetization ratio in our sample, when compared to some other studies, is probably due to the age and etiology of amputation (and cardiovascular comorbidities associated with them) of our patients. More success in prosthetic use in lower amputations is in order with the literature.

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Presented at 4th European Congress of
European Region from
World Confederation for Physical Therapy (WCPT)
Liverpool, 11-12 November 2016

PINBOARD

UPCOMING AMPUTEE CPD EVENTS

BACPAR

BACPAR South Thames Study Day

Pain Management of the amputee

Thursday 4th May 2017

Bowley Close Rehabilitation Centre

If interested please request an application form from **amy.jones2@gstt.nhs.uk**, priority will be given to South Thames Bacpar members

Timetable

8:50	**Registration**
9:00	Welcome and introduction
9:15	Vascular pain: Miss Rachel Bell / Becky Sandford (GSTT)
10:00	Pharmaceutical pain: GSTT pharmacist
10:45	**Break**
11:00	Chronic pain management: Nicolas Spahr (Physio GSTT)
11:45	Acupuncture: Maria Andrews (GSTT)
12:30	**Lunch** Please bring your own lunch. There are some local cafes that you could pre-order from but there will be time constraints.
13:15	CBT / relaxation: Lisa Ferguson (GSTT)
14:00	GMI: Ed Morrison (GSTT)
14:45	**Break**
15:00	Pain management: Nick Williamson (Pain specialist nurse, KCH)
15:45	Orthopaedic pain: Miss Tania Cubison (QVH)
16:00	Round-up and final discussions
16:30	**Finish**

BACPAR

BACPAR 2017 Conference and AGM

Held in Wolverhampton on the 16-17 November 2017

Conference programme to be confirmed.

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THE LIMBLESS ASSOCIATION

CHAMPIONING LIVES BEYOND BARRIERS

The Limbless Association (LA), a registered charity, has been supporting amputees for over 30 years. Debbie Bent, LA Charity Manager, highlights the charity's key services and recent developments.

As a user led charity and membership association, our collective shared experience of limb loss informs and shapes our services. The majority of amputees we support have received excellent medical care throughout their pre and post-operative care. However, once discharged from hospital, and before, dealing with the practical and emotional impact - short, mid and longer term - of limb loss is a complex and very personal unpredictable journey for the individual and their families. We believe that our services have the potential to offer a seamless support solution in an early intervention approach to the recovery process for amputees and the medical teams caring for them.

No amputee need cope alone!

The LA aims to support amputees, pre and post-amputation, to navigate the associated complexities with advice, information and signposting to empower individuals and their families to optimise their recovery and rehabilitation. Over the years and through our lived experience, our services have developed across three key areas of provision: the LA's Help Desk, Welfare Rights Advice and its peer-to-peer support service, the Volunteer Visitor scheme. We also have an expert legal panel ready to assist those with potential claims and whose members have extensive experience of advising and representing amputees. The LA's website provides a comprehensive resource while our quarterly magazine, **StepForward** is a multi-stakeholder communications and engagement medium that aims to inform and connect the LA's membership and wider audience. We have a monthly newsletter that informs and connects our subscribers.

The building blocks of recovery...

Anger, fear, denial, grief, vulnerability, loneliness – are common emotions expressed to us by new amputees. Charities exist to find solutions to problems and to ultimately make a tangible difference. The Limbless Association's mission is to support amputees in achieving full recovery and rehabilitation and we truly love the work we do. Our members and the amputees we support are friends for life and many progress to giving their support in return through awareness-raising, fundraising or participating in our Volunteer Visitor scheme. The following case study demonstrates the potential impact of the LA's peer to peer support service.

"I use my skills and experiences to help others."

"I had an elective amputation of my right leg below the knee in 20111. Before the procedure I was anxious about what the future held for my family and me. I had lots of questions, but no one was able to answer them adequately. Would I be able to work again? Would I be able to drive? How would I take a shower? I got in touch with the LA and they sent a VV called Brian to see me. Brian was excellent and answered all my questions in a straightforward and positive manner. I decided that once I was fully recovered I would become a Volunteer Visitor and try to help others realise there is a future after amputation. To me, volunteering means using my skills and experiences to help others. I've been through the process of amputation and experienced both the physical and for just one other person to get through that process, I'll be happy." *Peter McTigue*

Another Volunteer Visitor summarises, "I hope that I've helped some people realise they are far stronger than they thought they were and that being an amputee is not the end of a fulfilling life. Not all amputees want to achieve great things, just being able to live normally is a fantastic achievement in itself." *Mark Stuart*

Navigating the benefits maze

The UK benefits system can be a tricky maze to navigate – especially if you've never claimed before, as is the case for many new amputees. That's why the LA is helping people with limb loss to access the support they are entitled to. We strongly believe that the LA's Welfare Rights Service forms an essential component of an early intervention programme of support that enables amputees to concentrate on their physical rehabilitation and wellbeing. While this area of advice has for several years been provided though our telephone Help Desk, in August 2017 we began to deliver 1-2-1 support sessions at: The Amputee Rehabilitation Unit (ARU) - Kennington, Royal Free Hospital and Harold Wood Disablement Centre. During these appointments, new amputees are supported with their benefits entitlements as well as being made aware of the other ways we can support them, their carers and families throughout their rehabilitation. The LA team are excited about the difference our recently piloted outreach service is already making and look forward to developing and expanding further in 2017 and beyond. We are now receiving enquiries from medical teams across the UK and are in the process of capacity building to realise our ambitions of delivering this approach to as many new amputees as possible.

Let's collaborate!

We would welcome the opportunity to work closely with specialist teams to ensure that amputees are supported holistically at the earliest possible stage and though connectivity with the amputee community, ultimately continue to be supported for a lifetime.

Please get in touch to find out more about our services and to discuss how we can work together in realising fulfilled lives beyond limb loss:
deborah@limbless-association.org
enquiries@limbless-association.org
Telephone: **01246 216670**
Website: **www.limbless-association.org**

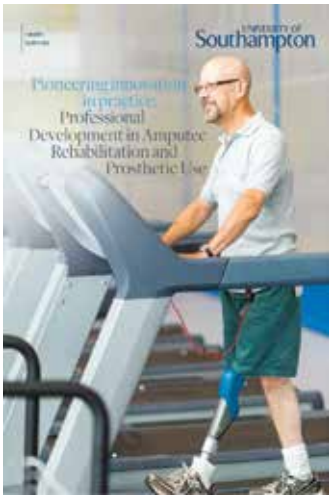
MSC HEALTH SCIENCES (AMPUTATION AND PROSTHETIC REHABILITATION):

SHARING POSTERS FROM THE FIRST MODULE

As many of you will remember, BACPAR put out a call to all physiotherapy courses in the UK requesting proposals to develop new Master's level CPD opportunities within the field of amputee rehabilitation.

This led to the University of Southampton developing and validating a new and exciting MSc pathway in Amputation ad Prosthetic Rehabilitation that sits within an established MSc Health Sciences programme. The MSc pathway is aimed at multidisciplinary healthcare professionals currently working in amputee rehabilitation or who would like to move into the field. It has been designed to offer flexible learning opportunities that range from completing a single standalone module to the entire MSc pathway with additional options of a Postgraduate Certificate or Diploma. The two amputee specific modules (Module 1: 'Amputation Rehabilitation and Prosthetic Use' and Module 2: 'Contemporary Issues in Limb Loss') have now run for the first time and worked well with a good number of students from a mix of different backgrounds.

The first module 'Amputation Rehabilitation and Prosthetic Use' (20 ECTS credits) ran in two four day teaching blocks (including week-ends) in October and December 2016 and a 'Prosthetic Industry Study Day'. This was a great day involving new research and a large number of prosthetic stakeholders.



The students were actively involved in the day and developed conference posters as part of a formative assessment. Several students have given permission to share their posters with you and we would like to present the first group of posters in this journal.

To find out more about these learning opportunities or the dates for next year, please contact the programme leads:

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Frimley Health NHS Foundation Trust

University of Southampton

"Brain Training":
The Effectiveness of Graded Motor Imagery for Lower Limb Phantom Limb Pain

Lauren Newcombe, Lead Vascular Physiotherapist

Introduction

Phantom Limb Pain is prevalent in up to 80% of amputees[2] and can range from being mild to severely debilitating. It is a complex phenomenon which is poorly understood but often classified as a pathological pain state due to the underlying cortical changes and disruption to neural processing[3]. Recent evidence suggests that movement representation techniques such as Graded Motor Imagery (GMI) could reduce pain and disability in patients with pathological pain by directly addressing cortical reorganisation[4].

Aim:

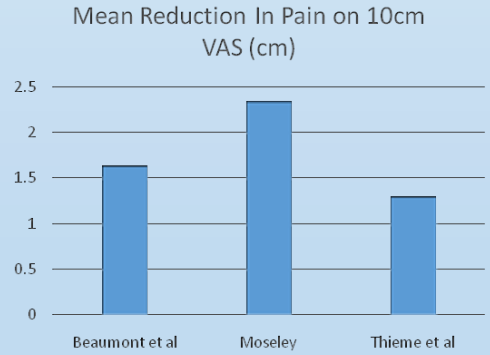
To establish whether Graded Motor Imagery is effective in reducing Phantom Limb Pain in Lower Limb Amputees.

Laterality → **Imagined Movements** → **Mirror Box**

Studies Reviewed:

Author	Study Type	Intervention	Strengths of Study	Key Limitations of Study
Beaumont et al (2011)	Research Report	Laterality and imagined movements	• Key issue identified • Amputee population	• Questionable methodology • Not representative of LL amputee population (excluded vascular patients) and potential bias • Only 2 phases of GMI used
Moseley (2006)	Single blinded RCT	GMI v Standard Medical Care (Physiotherapy and medication)	• Single blinded RCT • Full GMI intervention • 6 month follow up	• Small sample size (9 LL amputees) • No specified intervention in control group (what is standard care?) • Author pioneered GMI but evidence of attempts to eliminate bias
Thieme et al (2015)	Systematic Literature Review	GMI, mirror box, 1 to 2 stages of GMI	• Robust methodology	• Variable interventions (some studies only included 1 to 2 phases of GMI) • Population not exclusive to amputees • Small sample sizes of LL amputees

Results:



Conclusion:

Graded Motor Imagery has been shown to be effective in reducing pain and disability in pathological pain states, including phantom limb pain. However, due to small sample sizes, restricted amputee populations and varied therapy delivery, these results are not statistically significant for amputees and firm conclusions cannot be drawn about the effectiveness of graded motor imagery for phantom limb pain. Further research of sound methodological quality is essential to determine whether GMI should be a considered treatment option in the management of PLP.

Recommendations:

- Further randomised controlled trials of sound methodological quality into the effectiveness of GMI for phantom limb pain
- Further research into the optimal application of GMI for amputees, considering time to intervention, length of intervention, level of supervision and intervention structure.
- Further studies into how GMI reduces pain

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Predictors of Functional Outcome Following Lower Limb Amputation

Joanne Barnes BSc MCSP Highly Specialised Physiotherapist

Introduction

Lower limb amputation has a significant effect on many aspects of an individual[1]. Quality of life has been found to be significantly associated with daily function and mobility[1]. Multidisciplinary rehab following lower limb amputation plays an important role in restoring function in an individuals activities of daily living[2]. Functional outcome and prosthetic use following lower limb amputation has been associated with several factors and can be difficult to predict[3]. Amputee rehabilitation services and clinical practice guidelines vary and are developed largely through expert consensus[2]. Knowledge of potential factors as predictors may provide early detection of individuals at risk of poor functional outcome or prosthetic disuse, and guide therapists treatment plan[4].

Themes identified from literature review

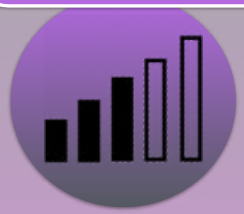
Age

The age of an amputee was found to be significantly correlated to their ability and behaviours towards activities of daily living[6]. Older individuals were found to have more restrictions in their daily functioning and activities one year post amputation[5,6]. Similarly, those aged over 55 reported to mobilise with their prosthesis less on a daily basis, however this was found within a small sample size[5].

Social Support

A study of 87 patients found that those with a greater level of social support would use their prosthesis more for functional tasks and would walk for longer, optimising their functional independence[5]. Similar results were found for individuals who had a partner present at home, however this was not found to be significant[6].

Amputation Level



Distal amputations, such as transtibial, have been found to have greater functional outcomes and prosthetic use compared to transfemoral amputees[4,5]. Studies in the inpatient and community setting have found a greater functional daily use of their prosthesis, which remains apparent up to one year following amputation[4,5].

Mood and Cognition

A greater level of cognitive function was significantly related to better outcomes on the timed up and go test following amputation[4,6]. Depression has also been linked to daily mobility and use of a prosthesis and found to be the most meaningful clinical factor adversely affecting prosthesis use[5]. Additionally memory, ability to process information and cognition at 2 weeks following amputation has been shown as an important predictor of future functional outcome[6].

Pain

A study of older adults found the absence of phantom limb pain was positively associated with continual use of a prosthesis following a period of rehabilitation[4]. However similar and larger sized studies concluded that neither residual limb pain or phantom limb pain affects future functional outcomes[5,6].

Function

Individuals who reported a greater baseline function pre-operatively were significantly associated with prosthetic use and post-operative function at one year follow up[4]. A positive correlation has been seen between single leg stance and ongoing use of a prosthesis[4,6]. Single leg stance, of the remaining limb, at two weeks following amputation proved to be a strong physical predictor for functional outcome when reviewed again at one year post amputation[6].

Conclusion

The literature shows that functional outcome and prosthetic use following lower limb amputation is complex and multifactorial[1-6]. Comparison of the literature highlights that a greater functional outcome is associated with distal amputation level, greater social support, younger, good cognitive function, absence of pain and being ambulatory pre-amputation.

Several limitations within the literature are worth considering such as the small sample sizes, treatment not standardised or randomised and little is known about the quality or quantity of treatment. Also the high use of self-reported measures could give rise to bias affecting the reliability of the results.

Knowledge of these potential predicting factors alongside national guidelines and clinical expertise could offer helpful information in the clinical reasoning and decision making of amputee rehabilitation and management.

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University of Southampton

Guy's and St Thomas' NHS
NHS Foundation Trust

Clinical efficacy of rigid dressings post transtibial amputation

Sarah Holden MSc (Pre Reg), MCSP

UNIVERSITY OF Southampton

Oxford University Hospitals NHS
NHS Foundation Trust

Introduction

- Numerous types of dressings used in practice with combinations of rigid removable (RRD) and soft dressings (SD).
- RRD aims to reduce oedema, promote healing and reduce time to prosthesis as well as protection against injury [1].

Aim

To evaluate the clinical effectiveness of rigid dressings by reviewing and critically appraising current literature within the area.

Author	Experimental	Control	Primary OM	Findings
Deutsch et al. 2005[2] **RCT**	RRD (Fibreglass and resin sock)	SD (crepe bandage)	Oedema Time to wound healing Time to prosthetic fit Stabilisation of stump vol Reduced LoS	Trend of RRD increasing wound healing in 2/52 but not sig No sig difference in other parameters
Johnannesson et al. 2008[3] **RCT**	ORD (Ossur™removable vacuum dressing)	RRD (POP)	Time to prosthetic fit	No sig difference in wound healing or time to prosthesis
Woodburn et al. 2004[4] **RCT**	RRD (plaster dressing)	SD (soft dressing-surgeon preference)	Time to prosthetic fit Questionnaire on use of RRD	Median reduction of 6 days to casting but not significant. Staff wished to continue RRD

Ossur™ RRD

RRD[5]

Method

- Search using Delphis, Athens, Google Scholar
- Critical appraisal of 3 research papers using CASP tool

Discussion

- Strong suggestion RRD offers protection to residuum and reduces time to prosthesis but not significant
- Potential to reduce risk of knee flexion contractures
- Low sample sizes in studies limiting power and thus statistical significance.
- Difficulty in measuring stump volume-studies using amount of sockets fitted and not measurement of residual volume
- Varied techniques and skill levels in applications. Training of staff not always addressed.
- Variation in SD applications in control-surgical preference
- Variation on RRD application and materials
- Cost effectiveness an issue with ORD-results comparable to cheaper standard RRD

Conclusion

- Strong indication that RRDs may be effective form of post surgical dressing in that it can reduce time to prosthetic and protects residuum however not conclusive.
- More RCTs required to compare all types of RRDs but not an easy task. Future research should include cost analyses and practicalities in clinical settings. Guidance is also required for training of staff and application of RRD in clinical practice.

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5. Picture credit: RRD Amputee Information Booklet Physiotherapy Dept, The Queen Elizabeth Hospital , South Australia, Via Austpar

UNIVERSITY OF Southampton

The Management and Prevention of Falls in Lower Limb Amputees Post Hospital Discharge

Background

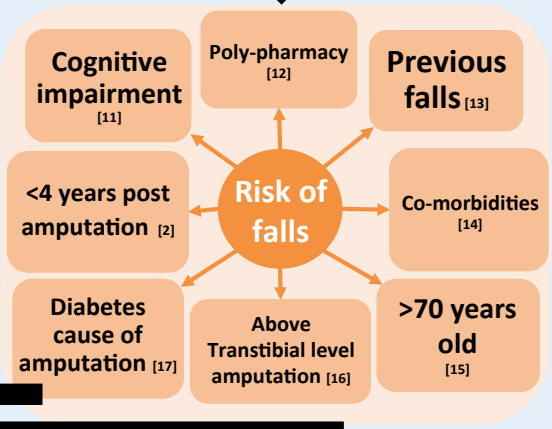
- Over 50% of amputees fall each year [1, 2]
- Amputees are ***vulnerable*** to falls;
  - ***Patient related*** factors e.g. altered balance, strength and gait pattern [3]
  - ***Prosthesis*** factors e.g. discomfort/pain[2]
  - ***Environmental*** factors e.g. tripping at home [4]
- Need to prevent falling:
  - ***Injury*** e.g. hip fracture, stump damage [5]
  - ***Death*** [9, 6]
  - ***Fear of falling*** reduces quality of life [7]
  - ***Decreased independence*** [8]
- Important to teach ***backward training*** [9]; this can reduce 'long lie' following a fall [10]
- ***Limited evidence*** for amputee falls = Elderly fallers evidence is used to guide prevention

"Programmes (to reduce falls) should include a combination of exercises to be effective" [1]

What is a fall?

A Fall: 'An unintentional event which results in a person coming to rest inadvertently on the ground/floor/lower level' [1, 9]

What can predispose falls?



Guidelines:
Balance work should be included in falls prevention strategies [1]!
What is the research behind this?

1 Dynamic Balance Training During Standing in People with Trans-Tibial Amputation: A Pilot Study (2003) [19]

- ***Small convenience sample***: 14 traumatic amputation participants (Diabetic neuropathy have more balance problems
- All ***>9 years post amputation*** (best period for balance retraining is soon after amputation)
- Only used ***Transtibial*** amputees
- ***No comparison*** group
- No blinding to results
- Dynamic balance (progressive increase in difficulty)
- Methodology extensive for replication
- Therapeutic intervention limited to 5 sessions

- ***Results:***
- Improvement in all 3 outcome measures
- Only 10m test had statistical significance
- High standard deviation for SLS
- ***No follow-ups*** noted
- Could be successful++ in earlier amputees

2 Effect of Balance Exercises on Balance Control in Unilateral Lower Limb Amputees (2009) [19]

- ***Sample size 30:*** Transtibial and Transfemoral
- No evidence of sample power
- Comparison group
- Early phase balance training (pts >2 months post-amp)= best time to initiate balance training
- Younger participants (not commonly explored)
- Single blinded

- ***Results:***
- Statistical significance in both outcome measures (functional reach and Global balance performance) for experimental group
- Area that the non-amputated leg covers is more than the amputated side= should concentrate on strength in that leg

3 A randomized controlled trial of an enhanced balance training program to improve mobility and reduce falls in elderly patients (2003) [21]

- ***RCT with large sample:*** Uses elderly participants (60+)
- ***High drop out*** rate=65 (more in EBT)
- ***Excluded amputees*** without rationale
- ***Comparison*** to conventional techniques
- Dynamic focus of enhanced programme (Very functional day to day focus)
- Highly ***standardised*** protocol with single blinding
- ***Results:***
- Good follow up time (6, 12, 24 weeks)
- Sample adequately powered
- ***No statistical significant difference*** in outcome measures between groups (6 or 24 weeks)
- Both groups ***improved*** BBS, no. of falls, QOL scores and 10M walk test
- 7% EBT group reported ***inadequate therapy*** time compared with 72% control group

Conclusions…

- Within 'balance training' a lot of ***differing methodology***
- ***Consensus:*** Dynamic balance is more effective than static at increasing balance and reducing falls
- Transfemoral have more balance problems due to loss of 2 joints
- 2 trials with amputees= better results with ***specific, dynamic training***
- These trials lack rigor/ reliability, the more robust elderly trial showed no benefits
- May show older peoples fall preventions are not applicable for amputees/ the more robust trial may show true results
- More research needs to be done for specific amputee falls prevention so that the interventions are ***specific and successful for amputees***

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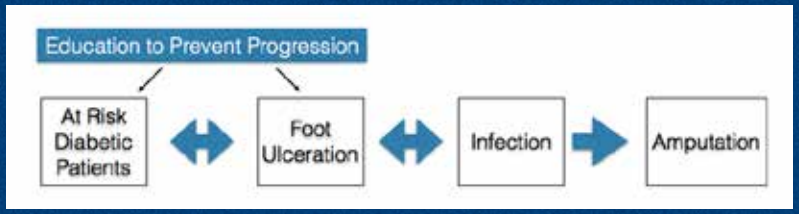
Lauren Denning, BSc Physiotherapy Graduate

Do Foot Care Programs Reduce Amputations in Diabetic Patients?

UNIVERSITY OF Southampton

Background:
Amputation is a complication of diabetes that has a significant impact on a persons health and socioeconomic status. Diabetic patients are 10-15 times more likely to have an amputations[2] then non-diabetic patients. The complications associated with diabetes, make this population particularly at risk. These factors can result in ulceration, infection and ultimately amputation[2]. Mortality can be as high a 50% at 2 years post amputation[1] and the risk of a contralateral amputation is 50% within the first 4 years[2]. Diabetic patients often have a poor understanding of their condition and associated risks.



Research methods:
Three studies were chosen because they investigated the impact of foot care teams and educational programs on diabetic patients

Krishnan et al (2008)
- Prospective study
- Survey of population
- 11 years
- MDT foot care team

Al-Wahbi (2010)
- Retrospective study
- 2 years
- Randomly selected patients
- 41 patients
- Foot care program
- Before and After groups

Canavan et al (2008)
- Longitudinal study
- 5 years
- 454 patients
- Capture-recapture method
- MDT foot care team

Study	Results	Strengths/Limitations
Krishnan et al	• Major amputations fell by 61.5% in the general population and by 81.6% in the diabetic population.	• 2 year baseline data • Retrospective studies underestimate amputation rates • Unknown sample size
Al-Wahbi	• Reduction in BK amputations in after group • Increased awareness by patients and healthcare professionals	• Small sample size • Randomly chosen • Control group • Not UK based, limited comparison to NHS services
Canavan et al	• Significant reduction in the diabetic amputation rates • Primary and secondary diabetic related amputations both fell significantly • Non-diabetic related amputations rose	• Compared diabetic and non diabetic populations • Standardised collection protocol (GLEAS) • Other factors affecting amputation rates

Conclusions:
- Foot care programs have a significant effect on diabetic amputation rates
- Other factors may have influenced results e.g. improved surgical techniques
- Results are comparable to other studies in UK and internationally
- Studies had different methods over varying time periods with limited details about foot care programs
- MDT foot care teams meant earlier detection of issues and prevent disease progression.
- Increase awareness of complications by both patients and healthcare professionals
- Future studies are needed to establish if a sustained improvement has been achieved

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