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The Journal
Issue 41, Autumn 2014

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BACPAR 2014 Annual National Conference

13th and 14th November

Wolverhampton Science Park

CONFERENCE PROGRAMME

Thursday 13th November

09.30 Registration

10.00 Welcome

10.10 What should we do with a painful knee/back in established amputees?
Mark Buckley, Clinical Specialist Physiotherapist, Shrewsbury and Telford Hospital NHS Trust

10.40 My stump looks like this, should I panic?
Talia Lea, Vascular Specialist Nurse, Guys and St Thomas NHS Trust

11.10 Dementia and communication strategies
Louise Briggs, Allied Health Professional Therapy Consultant, St George's Healthcare NHS Trust

11.50 ISPO and Specialist Equipment Commissioning Updates
Laura Burgess, Clinical Specialist Physiotherapist, Imperial College Healthcare NHS Trust

12.10 AGM

13.00 LUNCH

14.00 Key Note Speeches: (running simultaneously)

Basic Prosthetic Knee Rehabilitation
Helen Scott, Team Leader Physiotherapist, WestMARC Prosthetics Service

Advanced Prosthetic Knee Rehabilitation
Carolyn Hirons, Physiotherapist, PACE Rehabilitation

15.00 Falls and a balance circuit group for amputees
Kate Lancaster, Senior Physiotherapist, St George's Healthcare NHS Trust

15.30 Results from study into Phantom Limb pain and using Relax socks
Vicky Jarvis, Prosthetic Services Manager, RSL Steeper

15.45 Open Discussion

16.00 Close

Day Two Friday 14th November

08.30 My Paralympic experiences at Sochi and London
Rachael Neilson, Prosthetist, Maltings Mobility Centre Wolverhampton

09.00 Working with my Prosthetist
Caroline Cater + Sarah Evans, Physiotherapist and Prosthetist at Wirral Limb Centre

09.45 Graded Motor Imagery with early post-op patients
Jennifer Fulton, Therapy Lead Amputee and Sarcoma Services, Royal National Orthopaedic Hospital

10.00 Oedema management techniques: A review of current practice
Lizzie Torrance, Specialist Vascular Physiotherapist, Heart of England NHS Foundation Trust

10.15 Service Evaluation of RRDs
Liz Bouch, Senior Specialist Physiotherapist, CMFT Manchester

10.30 Open Discussion

10.45 Morning Break

11.15 Intermittent.Claudication
Liz Bouch

11.30 Supervised Exercise Program for Intermittent Claudication survey
Lauren D'Sa and Kate Ge, Medical Students, Academic Department of Vascular Surgery, Imperial College London

11.45 Open Discussion

12.00 LUNCH

13.00 Exercise physiology and the response to exercise in lower limb amputees
Amanda Thomas, Clinical Specialist Physiotherapist, Barts Health NHS Trust

13.40 Handicap international and the Trauma register
Peter Skelton, Physiotherapist, Handicap International

14.00 Report on the NCEPOD study on Lower Limb Amputation
Julia Earle, Clinical Specialist Physiotherapist in Amputee Rehab, Gillingham DSC

14.15 Open Discussion

15.00 Close

BACPAR Journal Issue 41, Autumn 2014

Contents

Guidelines for Journal Article Submission

- Please send the article as a Word or PDF file.

- If your article includes pictures please also send these as separate files (JPEG, BMP, GIF, PNG etc format) at the highest quality you have. It would really help if you could put your name on them so they link to the article please!!

- If your article includes graphs please also send these 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). If all the graphs are in one Excel file this is fine.

Please email bacpar@flutefamily.me.uk with your submissions and any queries

DEADLINE for Spring 2015:

Friday 20th February 2015

Hello All

So, BACPAR is coming up to its 21st birthday, don't worry I won't get you to sing Happy Birthday again, but I can't believe it's a year since we were preparing for the 20th Anniversary conference.

This year's conference planning is progressing well and by the time of publication I would hope that most of you have booked your place at Conference for the 13th and 14th of November- if not – what are you waiting for? As you can see in this journal the programme promises to fulfil a number of learning needs identified on your membership applications and requests submitted on the evaluation forms from last year's conference. And because we are meeting in Wolverhampton I will aim to find us somewhere to meet and eat on the Thursday evening so we can make the most of our time together.

As ever we will have the AGM at the conference so I would hope to update you on our network's activities and involve you, the Membership, in the planning for 2015.

I will provide evidence that BACPAR; the members and committee, continue to work selflessly on projects with the following aims:

- To encourage, promote and facilitate interchange of knowledge, skills and ideas between members of BACPAR
- To establish and promote the implementation of best practice in the field of amputation and limb deficiency rehabilitation
- To improve communication and understanding between all disciplines working in the field of amputation and limb deficiency rehabilitation
- To improve post registration education in this speciality
- To encourage research in this speciality
- To provide support and information between members and contact with similar organisations nationally and internationally
- To support CSP policy and strategy where relevant to amputation and limb deficiency rehabilitation

If you haven't done so already, and you would like to get involved in BACPAR's projects, then don't hesitate to contact me (Louise.Tisdale@nhs.net) or an appropriate committee member (see the contact list in the Journal) and let us know what you would be interested in doing.

There will also be the opportunity to be part of the Executive Committee; the role of Honorary Secretary is up for election at the AGM. A big thank you to Lucy for keeping us organised and providing fantastic sets of AGM and Exec Committee minutes over the last 3 years.

See you in Wolverhampton in November.

Louise Tisdale - BACPAR Chair 2014

Secretary's Report

I'm sure autumn has sprung itself on us too soon this year. Driving to work yesterday in the middle of August and its only 3°! And autumn means it's very nearly BACPAR conference time again. It's another fantastic program this year so hopefully lots of you have already applied taking advantage of the early bird rate.

BACPAR continues to go from strength to strength, being one of the most active Professional Networks . As always this is driven by a committed committee that has been very well supported by a core group of people who voluntarily move from role to role over the years and what they are looking for now is new blood! Each year at the annual conference an

election is held to fill any vacant posts and so it's time for new blood to join. Posts are for a 3 year term and be can be held for 2 terms.

However, despite my cry for new committee members there is only one post up for election this year; secretary (my post!). You should have received an email by now with a nomination form and job description. If you would like further details please contact me. It is a lovely post to have and so much easier than the old days when it was just pen, paper and the royal mail.

If you are keen to join the committee but don't fancy this post – have a word with your regional rep. The regional rep posts have no maximum term and so some regions have had the same rep for several years. You may find they are keen to share the load or even step down.

Finally as secretary I receive the education and research bursary applications and over the last couple of years there has been a drop in the number of applications. Do remember that if you have been a BACPAR member for 2 years you can apply and this can be done retrospectively. This is potentially a useful source of funding in these financially strapping times. Applications will be considered at the Spring and Autumn BACPAR executive committee meetings held in March and September.

Enjoy reading this edition of the Journal.

Lucy Holt

BACPAR West Midlands Region

The Higher Activity Patient. Study Day at Wolverhampton 1st May 2014

Wolverhampton is becoming the centre of the BACPAR universe, with it being the venue of choice for the conference and now the place for the West Midlands Study Day.

In previous years, the West Midlands Meetings have been half-day events (twice a year) usually with an information sharing agenda and a short presentation. It was usually well attended by the West Midlands BACPAR members. The full-day format gave more time for presentations and was advertised for all BACPAR members. It certainly proved popular with more than 30 people coming from far and wide – Newcastle, Sheffield, London, Bristol.

The theme was the Higher Activity Patient.

The morning session was kicked off by Louise Tisdale and prosthetist, Rachel Nielson with a presentation titled 'You want to do what??' It gave us food for thought, such as what level of fitness a patient needs to start training for higher activities, some thoughts about diabetes and blood pressure control, and to be mindful that recreational exercise does not need 'sport 'prostheses. We were also encouraged to consider other sports rather than running.

Next on the agenda was a critique session led by Hilary Smith on the latest SAGE article purchased by BACPAR. This article is on the BACPAR website and we have put up a compilation of our critique session on the website for you to read / comment on.

The article was titled 'A prospective study of the importance of life goal characteristics and goal adjustment capacities in the longer term psychosocial adjustment to lower limb amputation' by the authors of the TAPES questionnaire. The consensus was that it was not easy article to read. The subject matter was important and needs to be address during rehabilitation. It was felt that the sample size was rather small and the authors only concentrated on limb wearers - so what about non-limb wearers. The terminology was confusing when it jumped from goal engagement to goal re-engagement, goal disengagement and goal disturbance and most of us took a number of reads of the paper to make sense of it. The group wondered how counsellors approached goal setting and would the Goal facilitation Index (GFI) questionnaire help to direct goal setting during rehabilitation?

There was an audit session after the paper critique. Three audits were presented. Hilary Smith reported on developing physiotherapy input into the diabetic foot clinic demonstrating good collaboration with other professional within Burton hospital. Lucy Parkes from Russells Hall Hospital presented her finding after auditing against the BACPAR contralateral foot guidelines and I gave a history lesson of 10 years of SIGAM audits – very dry, so good job there was a cup of coffee at the end of this !!

After refreshments Kim Ryder gave feedback on the BACPAR executive meeting held in March. It was good to see that the agenda had moved on since my stint as secretary and that changing to a two day format seemed to develop ideas further and quicker and more effectively. Kim noted that there were many familiar faces still on the executive from the last time she attended these meetings and commented that some new faces would be appreciated. The next elections will be in November so please consider putting your name forward for a post.

The last session of the morning was given by BACPAR's answer to Bob Gailey – Penny Broomhead. She presented 'Amputee Running – the theory'. Penny emphasised that NHS prostheses are quite adequate for recreational sport and that some sports do not require prostheses. She gave good practical tips to help patients to care for themselves before, during and after sporting activities.

Following lunch in the bar overlooking the running and cycle track, it was down to the sports hall for some action with some willing patients who were happy to show how to start running training. Everyone seemed to pick up the rudiments of running really quickly and most did not have any 'special' hardware. Most of these patients were all fairly new to running and a number had only been limb wearers for 12 months or so and were selected to represent the more typical NHS patient – they were not particularly fit and none of them were competitive athletes.

Exercises to help with strength, proprioception and balance were also practiced. After 'the class', representatives from Otto Bock, Blatchford and RSL Steeper demonstrated some of their prosthetic feet, which could enhance sporting activities. They all brought their own amputee patients with them to use as models – with the highlight of the day being the discovery of a pile of horse manure and straw inside a patient's foot shell. Good to see that the leg was getting good wear!

It was an excellent day which has been confirmed by the evaluations received so a big thank you needs to go to Kim Ryder for her hard work in organising the day. Other big thanks need to go to the patients who gave up their time to join in with the running class in the afternoon. Thank you to all the presenters and thank you to the prosthetic companies for their input and sponsorship, which helped to keep the cost down and assisted in making a successful day.

Ruth Woodruff, Physiotherapist, Specialised Mobility Centre, Stoke-on-Trent

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Kate Lancaster, Physiotherapist - Queen Mary's Hospital, Roehampton

St George's Healthcare NHS
NHS Trust

Falls Prevention for Lower Limb Amputees using a Balance Circuit Group

Introduction

There are many reasons why people fall later in life – medications, footwear, eyesight, uneven paving, weakness, medical conditions, etc. Often it is a combination of factors that lead to a fall. 35-50% of adults over 65 fall. This rises to over 45% for people over 80 (Department of Health 2009). Lower limb amputees (LLA) fall more than age matched, able bodied individuals (Miller et al 2001 & 2003). Gait & balance impairments as a result of amputation or ageing are major risk factors for falls (Mian et al 2007). The cost of falls to the NHS (Eng & Wales) is around £15.2 million per year. The consequences of falling include minor injuries, fractures, increased fear of falling, reduced mobility & confidence, social isolation, increased dependency and even death. In LLAs falls can also damage prostheses, require revision of stumps to higher levels and lead to increased length of stay in hospital (BACPAR 2008).

What Exercises?

A multifactoral approach is often required in the treatment of falls. The most effective component of this intervention is therapeutic exercise, as balance impairment and muscle weakness caused by ageing and disuse are the most prevalent, modifiable risk factors for falls (Department of Health 2009).

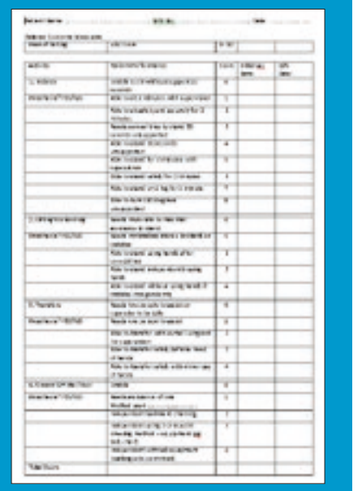
Research into effective exercise in preventing falls in older people has shown that programmes such as Otago or FaME can reduce the risk of falls by up to 54%. (Cochrane review 2012).

Falls prevention exercise needs to be individually tailored. It should focus on lower limb strengthening, challenging balance and be progressive to be effective. Exercises need to be performed regularly (ideally 2-3x per week) to maintain a level of strength and balance. If doing a weekly exercise class then additional 'prescribed' exercises should be carried out through the week. A 'dose' of 50 hours is thought to be required to reduce risk of falls.

Statistics and Group Development…

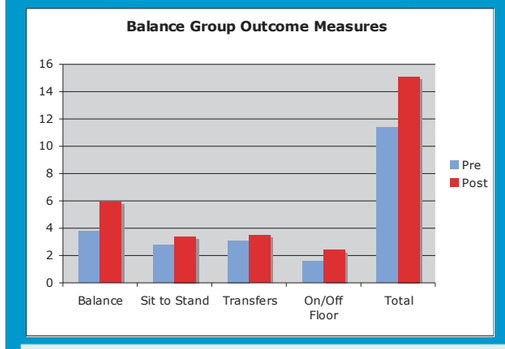
For older people, TUAG >15secs = increased risk of falling, but there are no equivalent statistics from outcome measures that can be used to predict an increased risk of falls in LLAs. At Roehampton when we assess our patients at discharge, 6/52 and 6/12 post discharge, not only do we collect TUAG, but we investigate falls and fear of falling.

There is no consensus of treatment in falls prevention for LLAs. Therefore at Roehampton, we decided to develop a circuit style exercise group targeting strength and balance, based on Otago, adding alternative exercises for single and bilateral amputees who may not be ready or have prostheses. An outcome measure was needed that was inclusive of our range of patients in terms of prosthetic user or not and whether they were a single or bilateral amputee. It also needed to measure change from pre to post prosthetic fitting. At Roehampton, we developed an outcome measure using aspects of the Berg Balance and Amppro, creating four sections - Balance, Sit to Stand, Transfers and getting off the floor. All patients are assessed pre and post completion of the group.



So Far …

At present the class has been run weekly since February 2013. for both our in and outpatients. Class numbers vary between 7 - 13 patients and have needed 1 member of staff for every 2 patients- to supervise the on/ off floor station, the plinth exercises and the exercises in the parallel bars. Somebody also needs to be the timekeeper and general motivator! The class runs for around 60 mins with a warm up and warm down and then 2 minutes per station. Our statistics are showing an improvement in all sections of the outcome measure between pre class and discharge. Feedback from the patients has been positive: "a good change in routine", "challenging for both prosthetic and non prosthetic users" and "enjoyable"!



The Future …

Our intention is to continue to collect the outcome measures for the class and evaluate if the group has reduced the incidence of falls whilst patients are receiving their current treatment. Our other goal is to see if a prediction limit can be made with the TUAG which is amputee specific by comparing the data we have gathered at discharge, 6/52 and 6/12 post discharge.

References

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- Department of Health, 2008 – Older Peoples NSF Standards
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- Miller et al. The prevalence of risk factors of falling & fear of falling among lower extremity amputees. Arch of Phys Med 2001;82:1031-6
- Vanicek, N. Biomechanical & psychological factors that distinguish fallers from non fallers: A comparative study of trans tibial amputees & able bodied individuals. 2009 PhD Thesis, Hull University

An Outline of the Management and Treatment of Peripheral Arterial Disease and the Role of Exercise Therapy

Epidemiology

Peripheral arterial disease (PAD) refers to a narrowing in the major blood vessels in the limbs usually caused by a build up of fatty deposits known as atherosclerosis. PAD has a gradual onset. If the occlusion is distal to the inguinal ligament it is characterised by pain in the calf muscle. Pain occurs in the buttock if the iliac arteries are affected. Patients often complain of walking a certain distance and having to stop. This is known as intermittent claudication (IC) and occurs when the metabolic demand of the muscles exceeds the capacity of the peripheral circulation to deliver oxygen, resulting in anaerobic respiration and pain. However between 20-50% of patients with PAD are asymptomatic (Kohlman-Thgoboff, 2013).

Rest pain is the most severe form of ischaemic pain. This is when the arterial supply cannot meet the metabolic demands even at rest. Often this can result in gangrene and ulceration with a significant risk of amputation (Taylor, 2013).

Intermittent claudication (IC) can become severe and progress into critical limb ischaemia (CLI) characterised by chronic rest pain possibly with ulceration and gangrene.

The prevalence of PAD increases markedly with age, affecting 3% of people under the age of 60 years, rising to >20% in people over 75 years (Tadej, 2013).

Table 1.1 illustrates the risk factors which lead to PAD (Madia, 2012).

Factors which increase the risk of PAD	
Factor	Risk is increased by:
Diabetes	1.5 – 4 times
Hypertension	4 times
Hyperlipidaemia	2 times
Smoking	4 times

Statistically patients with PAD are 60% more likely to die from coronary heart disease and MI and 12% more likely to die of stroke. Only 2% are at risk of major amputation (Warren, 2013). Figures from 2012 showed that 2.3 million people in the UK suffer from PAD. A fifth of these patients go on to develop critical limb ischaemia. Figures for amputations are consistently around an average of 11,573 per year and approximately 80% of these will be due to vascular disease (Franklin, 2013).

Pathophysiology

Atherosclerosis is caused by the damage to the endothelial lining of the artery followed by lipid rich deposits in the arterial wall. It tends to occur at arterial bifurcations where there are increased shear forces from the blood. Inflammatory cells, mostly monocytes, bind to receptors expressed by the damaged endothelial lining. Monocytes then migrate into the intima and take up oxidised low density lipoproteins (LDL's). Monocytes then become lipid laden and convert to foamy macrophages. When these foam cells die they release their contents and there is an accumulation of lipid pools in the initmal space. Macrophages also release cytokines and growth factors causing the smooth muscle cells to migrate from the media to the initma in an attempt to repair the damage. The atheromatous plaque will then develop the appearance of a lipid core covered by a fibrous cap which can remain asymptomatic until it becomes large enough to obstruct arterial flow (Walker et al, 2014) (Sakura et al, 2013).

Vascular Investigations

The severity of PAD can be classified using the Fontaine Classification of peripheral arterial disease, together with an accurate diagnosis of IC obtained using the Edinburgh Claudication Questionnaire (Taylor, 2013).

Table 1.2 Fontaine classification	
Stage	Symptoms
1	Asymptomatic (without symptoms)
2	Intermittent Claudication
3	Ischaemic rest pain
4	Severe rest pain with ulceration or gangrene or both.

Signs and symptoms of PAD are cool, pale and hairless skin in the lower limbs. There may be rubor or red colouration when the limb is dependant and pallor when the limb is elevated. The capillary refill is greater than 3 seconds and there may be ulcers or gangrene. Pulses can be palpated in the femoral, popliteal, dorsalis pedis and posterior tibial arteries and graded as normal, diminished or absent (Madia, 2012)

The Ankle Brachial Pressure Index (ABPI) is the most reliable method of diagnosing PAD. It is 95% sensitive and 99% specific. Systolic blood pressure is taken from the brachial artery on both arms and both ankles. The ABPI is the ratio of the higher reading in the ankle divided by the higher reading in the arm (Kohlman-Thgoboff, 2013). At the same time Doppler ultra sound signals are taken in the arteries of the foot (NICE, 2012).

Table 1.3 illustrates the values of the ABPI. An ABPI value greater than 1.3 indicates incompressible vessels due to calcification which is more common in diabetes. In this case it may be appropriate to take toe pressures (Chikkaveerappa, 2014).

ABPI and indications	
Value	Interpretation
>1.3	Hardened / Calcified vessels
- 1.2	Normal Range
0.9 - 1.0	Acceptable
0.8 - 0.9	Some arterial disease
0.5 - 0.8	Moderate arterial disease
<0.5	Severe arterial disease

Duplex ultra sound scan is the first line of imaging for patients with PAD followed by contrast enhanced MRI Scan or CT scan. Contrast-enhanced magnetic resonance angiography should be offered to people who need further investigation before considering revascularisation (NICE , 2012).

Management of Vascular Disease

Initial treatment of PAD is based on modifying the risk factors including stopping smoking, controlling diabetes, reducing cholesterol, improving diet, optimising body weight and doing regular physical exercise (NICE, 2012). The risk of a cardiovascular event should be reduced as far as possible with the above modifications. Therapeutic options include reducing the lipid profile with statin therapy and better management of high blood pressure and diabetes with appropriate medication and antiplatelet therapy (NICE, 2012).

The Trans Atlantic Inter-Society Consensus or TASC II (2009) provides the most recent management guidelines, which are aimed at both vascular pecialists and primary care clinicians.

Optimisation of diabetes management is paramount as poor glycaemic control puts patients at high risk for infections, ulcers and amputations and TASC II recommends an annual assessment of foot pulses. Blood pressure should also be

checked yearly (Lyden and Smouse, 2012). Antiplatelet therapy with low dose asprin can reduce the risk of MI or stroke by 22% (Warren, 2013) (Madia, 2012). Clopidogrel and dipyridamole may be alternatives to asprin. In the (CAPRIE) trial participants taking clopidogrel experienced an 8.7% relative risk reduction in cardiovascular death. Warfarin was found to be no more effective than asprin and carried a significant risk of life-threatening bleeding (Madia, 2012).

Table 1.4 illustrates the TASC guidelines and the treatment indicated.

TASC II Guidelines for Treatment of PAD		
Result / Risk	Level	Treatment
Serum LDL	<70mg/dL	Statins
HbA1c	< 7%.	Glycaemic control
Hypertension	140/90	Anti-hypertensives
Hypertension if diabetic or renal disease	130/90	Anti-hypertensives
Risk of MI		Anti-platelets

Smoking cessation is recommended to all patients for prevention of PAD, coronary artery disease (CAD) and stroke. Patients who stop smoking reduce their 10-year mortality from 54% to 18%, and lower the risk of critical limb ischemia (Madia, 2012).

Exercise Therapy

Exercise can be as good or better as medical or surgical interventions in the treatment of IC. Exercise for patients with PAD involves walking up to the point where they feel pain and cramp in the calf muscle and walking beyond this point until they have to stop. The Cochrane review (Leng et al, 2000) found that patients had 150% increase in walking time following exercise and at 12 month follow up that exercise was better than angioplasty. Exercise was found to be better than antiplatelet therapy, as good as by- pass surgery and in one study that exercise combined with pentoxifylline had 82% increase in walking time versus 62% in the walking group only. In another study on Cilostazol results were variable, but patients have improved mean walking distance by 50.7% compared with 24.3% in the group taking placebo (Madia, 2012).

Exercise is a low cost and effective treatment and the gold standard for patients with stable intermittent claudication (Leng et al, 2000). Sessions should start at 30 minutes increasing to 60 minutes at least three times per week and lasting for 6 month. In one study, patients committed to a walking program showed an increase in pain-free walking time of 180% and an increase in maximal walking time of 120%. Structured hospital exercise programmes where more effective than unsupervised programmes (Madia, 2012). Similarly, in a Cochrane Review (Fokkenrood, H. et al, 2013) reported improved walking distance of 150m compared with a non-supervised walking group and significant improvements in maximal treadmill walking distance.

Exercise does not necessarily have to be walking exercise. In one study, upper limb exercise was compared with lower limb exercise on its effectiveness at improving symptoms of IC in patients with PAD. The aerobic exercise training was carried out in 104 patients over a 24 week programme.

Table 1.5 illustrates the improvements made in the two types of exercise

Comparison of upper limb compared with lower limb exercise			
Type of exercise	Claudication Distance	Maximal walking distance	VO2 Peak (Aerobic Capacity)
Leg Cycle	51%	29%	65%
Arm Cycle	57%	31%	50%

The authors concluded that arm ergonometry could be a useful exercise training modality for improving claudication distance, walking performance, and cardiovascular function (Zwierska et al, 2005).

A study by Gardener et al (2005) investigated the intensity of exercise required to demonstrate improvements in walking distance. See Table 1.6.

Table 1.6 Intensity of exercise

Percentage of Maximal Intensity	Claudication Distance	Maximal walking distance
40%	109%	61%
80%	109%	63%

In this RCT study of 31 patients comparison was made with exercise of a lower intensity compared with a higher intensity over a 6 month period using a treadmill. Both groups had similar improvements in the claudication distance and maximum walking distance. This study shows that walking at sub-maximal intensity (40%) can still make improvements to patients with PAD.

Through exercise improved blood flow enhances the vasodilatatory response at the endothelial lining of the capillaries, improving microcirculation and aiding the development of collateral circulation (Warren, 2013). Improvements in the efficiency of oxygen extraction at the muscle can delay the onset of anaerobic respiration through an increase in size and number of mitochondria. Also, it is thought that there is an increase in Type 1 fibers which have more dense capillaries and therefore better oxygen supply to the tissues (Ernst and Fialka, 1993). Changes in blood rheology whereby the blood becomes more fluid can improve micro circulation in hypoxic muscles (Ernst and Matrai , 1987). Improved pain tolerance or pain perception will lead to psychological benefits.

Surgery

If the patient fails to improve with the previously mentioned measures and claudication is limiting or the pain worsens, endovascular interventions are an option.

The risks are low for endovascular repair due to advances in the techniques. According to a study of 1,000 patients undergoing percutaneous angioplasty the 30-day mortality rate was 0.5%, with an amputation rate of 0.5%. The patency rate of the vessel at 5 year follow up is better for larger diameter arteries as illustrated in Table 1.7. (Madia, 2012).

Table 1.7 Patency Rate Following Angioplasty at five year follow up

Artery	Patency
Femoral	73% - 77%
Politeal	42% - 55%

Open surgery is reserved for lesions not amenable to endovascular options such as calcified vessels and long lesions of stenosis and where angioplasty has been unsuccessful (Kim et al, 2006). In general, bypass that uses a vein such as the long saphenous vein has a higher patency than bypass using a prosthetic graft, such as PTFE (Madia, 2012). In the BASIL trial 452 patients presenting with critical limb ischaemia were randomized into either by-pass surgery or angioplasty groups. At 5 year follow up there were broadly similar outcomes in terms of amputation rate yet open surgery was more expensive (Bradbury, 2005). Despite improvements in the circulation of the limb the problems of cardiovascular disease is still apparent even after bypass surgery. Feinglass et al, (2001) reported that the mortality was low at 2% at 1 month post bypass surgery but at 44 months over 50% of patients had died due to a cardiovascular event.

Approximately 80% of patients will remain stable with intermittent claudication. However, if the disease progresses into critical limb ischaemia (CLI) the prognosis is much worse with a 25% amputation rate and 25% rate of mortality at 1 year (Madia, 2012).

NICE (2012) recommends that a patient is assessed by the vascular MDT when presenting with CLI before a decision is made to amputate and that all options for revascularisation are considered (Krysa et al, 2012). Amputation is a costly option; surgery alone is estimated at £12,000 together with prosthetic rehabilitation costing another £20,000.

The outcome post amputation is also quite poor, with a 2-year mortality rate of 16%-56 and a 5-year survival of just 22.6% - 45%. A higher mortality rate is associated with a higher amputation (Fleury, 2012). Consideration should be given to the level of amputation as this will affect the level of function the amputee will regain. Trans- tibial amputees

are much more likely to become independent (50%) compared with trans femoral amputees (25%) (De luccia et al). Trans-tibial amputees also use less energy to walk (62%) compared with trans-femoral amputees who use approximately 120% more energy to walk. The energy cost is even higher for bilateral trans-femoral amputees requiring 280% more energy to walk. These patients also have a poor functional outcome due to problems with proprioception, balance and comorbid diseases. The risk of becoming a bilateral amputee for patients with vascular disease rises by 10% per year and is between 33% and 50% over 5 years (Fleury, 2012).

Pre-morbid function may have been poor in vascular amputees. The patient is more than likely to be de-conditioned over some time because of limited mobility due to pain, ulcers and gangrene. The risk of falls is also high in the amputee population. In one study of 25 prosthetic-wearing amputees aged over 65 years, 64% of them had more than one fall a year (Fleury et al, 2012).

Public Health Initiatives

NICE (2012) recommends offering all people with PAD information, advice, support and treatment regarding the secondary prevention of cardiovascular disease by modifying the risk factors.

Smoking is a major risk factor for PAD. According to the Vascular Society (2012) 80% of vascular patients are current or ex smokers. In the 1980's 39% of adults smoked in the U.K. This figure has declined and has now levelled off at 22% of the population; this is due to the development of smoking cessation clinics and legislation. On the 1st July 2007 legislation was introduced to make workplaces and public places smoke free in England and has resulted in changes in attitudes and behaviours towards smoking. Research from Scotland reported a 17% decrease in heart attack admissions in the year after its ban (Baud, 2011). Cigarette smoking causes chronic inflammation not only in the lungs causing COPD and lung cancer but can lead to thromboembolism, atheroscerolsis, obesity , type 2 diabetes, PAD, hypertension, stroke, and cardio vascular disease (MeColl & Rothwell, 2009). On average smoking leads to the loss of 16 years of life (Baud, 2011).

Government initiatives to provide free treatment to aid smoking cessation has shown a good uptake; the proportion of smokers using medicines more than doubled from 8-9% in 1999 to 17% in 2002 (West et al, 2005). Smokers are four times more likely to quit smoking with treatment and advice than on their own. It has been reported that only about 39% of smokers ever receive counselling regarding smoking cessation from their health care clinicians (Matucky, 2010). When a patient is educated by a nurse practitioner they are almost twice as likely to attempt quitting as patients not counselled by a nurse practitioner (Chaney & Sheriff, 2012). To help a patient quit smoking it is suggested we follow the four A's of smoking cessation: Ask about smoking, Advise to quit, Offer Assistance and Arrange follow-up (Nilson & Fagerstrom, 2009) (Porter, 2013). Hospital environments should also advocate a smoking cessation message (Jones et al, 2011).

A health promotion scheme in the North West run by the NHS called 'Quit Smoking' has recently been campaigning in local hospitals. Many patients think there is little point in stopping smoking because the damage has already been done. However, 'Quit Smoking' outlines the benefits for health from the return of the pulse and blood pressure to normal limits after 20 minutes to the elimination of carbon monoxide after 24 hours and at 12 months circulation improvements and the risk of MI reduced to half. The service and treatment is free and is provided for a year. They offer support at 40 community drop in centres with group sessions and individual appointments as well as training for health care professionals, and GP's (Quit Smoking, 2014). The NHS also advertises on web sites giving advise on quitting such as the 'live well campaign' (Public Health England 2014).

Being overweight can be a risk factor for diabetes as well as increasing blood pressure and cholesterol. Obese patients are also less likely to exercise. In one study a weight management programme targeting obese patients with type 2 diabetes resulted in a change in body weight from 5-10% and improvement in HbA1c (Farrer & Golley, 2014). Although the study was small, in an RCT study of 48 diabetic patients and following a 6 month programme of exercise and nutritional advise 23% of the treatment group had lost weight and 45% had decreased in the waist circumference. Mean weight and waist size had increased in the control group. At 6 month follow up the treatment group were also more likely to continue exercising (Islam et al, 2013).

A local scheme run by Lancashire Care NHS Trust called 'Fit Squad' offers free weight management courses for anyone with a BMI over 25. They also offer exercise schemes at local leisure centres for patients with diabetes and PAD which is through a GP referral. Patients with PAD and diabetes who exercise less than the recommended level of 3 times per week for 30 minutes can be referred by their GP (Lancashire Care, 2014).

For patients with diabetes and PAD the development of multidisciplinary foot care clinics has cut amputation rates by half. Each year in the UK, around 5,000 people with diabetes undergo leg, foot or toe amputations, equivalent

to 100 patients a week. The cost of treating diabetic foot problems costs the NHS £3billion; 252m of this is spent on amputation. In March 2011 NICE published guidelines with the aim of the providing clear evidence based recommendations for reducing the number of amputations, improving patients quality of life and reducing costs to the NHS.

Lower extremity amputation rates at James Cook University Hospital, Middlesbrough, fell by two thirds after the introduction of a multidisciplinary team. The estimated saving was £249 000, more than seven times the cost of the team. Despite the NICE guidelines there are still high rates of amputations due to the lack of MDT pathways for dealing diabetic feet in certain areas. Areas where the Clinical Commissioning Group did not have a patient pathway had11% more amputations on average than those with a pathway. Amputation rates for patients with PAD and diabetes vary tremendously across the country. Patients in the southwest are twice as likely as those in London to have an amputation. Currently, 33% of acute trusts lack an MDT for diabetes (Franklin, 2013). Urgent referral within 24 hours to specialist care is essential to avoid amputations in patients with CLI as recommended by NICE; 35 out of 110 Clinical commissioning groups did not have an urgent referral pathway. The 24 hour rule can make the difference between whether a limb is salvaged or not.

A good example of an MDT pathway can be found in Manchester. It is called 'STAMP' and is the brainchild of Dr Dare Seriki. It involves the commissioning of a community based service to detect PAD early. The service provides an individual treatment plan based around appropriate medication, supervised exercise, stopping smoking, weight management and diabetes control and is overseen by the GP. So far, 80% of patients are managed in the community and only 20% of patients needed to see the vascular specialist. The cost saving for the NHS is estimated at 30% equal to £74,500 (Franklin, 2013).

Exercise has been shown to be beneficial and low cost in the treatment of patients with early onset and stable IC. In a Cochrane review by Fokkenrood et al (2013) 14 studies where reviewed, involving 1002 participants with PAD to evaluate supervised exercise regimes versus unsupervised exercises. Exercise was taken 3 times per week and involved a treadmill walking test as the outcome measure. Follow up ranged from 6-12 weeks post exercise. The authors concluded that supervised programmes had significant benefit in terms of maximal walking distance which was 180m better in this group and also in pain free walking distance compared with the unsupervised group. Further studies are recommended in quality of life and long term follow up. Despite the recommendations from NICE (2012) that supervised exercise programmes should be offered to all patients with PAD, in reality they are sporadic. Currently in most areas exercise prescription appears to be go home and walk with just a booklet guiding patients. There is no follow up or supervision and compliance is known to be low. Currently, the Physiotherapy interest group in Amputee Rehabilitation is doing a nationwide survey to benchmark the provision of supervised exercise programmes in the UK.

Conclusion

With an ageing population we are likely to see more patients with PAD and diabetes in the future. There is clear evidence that secondary prevention through antiplatelet therapy, lowering lipids, control of hypertension, exercise and weight loss programmes together with smoking cessation can play a significant role in reducing peripheral vascular disease with the added benefit of reducing cardiovascular risk.
The Department of Health's target in 2010 was to reduce mortality from cardiac diseases by 40% (Wyatt, 2012).Patients with PAD are at high risk of cardiovascular complications and 60% will die of cardiac related disease.
Exercise and stopping smoking can have a significant effect on both the progression of PAD and cardio vascular disease. It is cost effective, can be done in the local community and will reduce the number of patients developing severe claudication or heart disease and requiring expensive surgery. Benchmarking the provision of supervised exercise programmes in the UK will be a good starting point. As a physiotherapy profession we should be convincing the commissioners that we can save the NHS money and be promoting these services. Preventative medicine and health promotion should play a greater role in the care of patients with PAD and help to cut costs in the budget-tight NHS.

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I am clinical lead physio, at the Specialist Mobility Rehab Centre in Preston , Lancs the course was an on line module run by Edge Hill University in Vascular Disease Management by Chris Jones lasting 16 weeks

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Reliability of the Six Minute Walk Test and Timed Up & Go Test in Persons with Transfemoral Amputation

Abstract

Background: The Six-Minute Walk Test (6MWT) and Timed Up & Go Test (TUG), are increasingly being used as a functional outcome measures in for lower limbs amputee rehabilitation. Determining the validity, reliability and measurement properties of these outcome measures, the use in the rehabilitation of transfemoral amputees is necessary.

Objective: The main purpose of this study was to evaluate the test-retest reliability of the Six-Minute Walk Test (6MWT) and the Timed Up & Go Test (TUG) in persons with transfemoral amputations and to analyze the association between both tests. In addition, several variables related the 6MWT were studied.

Design: Two days test-retest design.

Methods: Thirty subjects (25 men, 5 women; mean age 44 years) with unilateral transfemoral amputation. Participants performed one trial of 6MWT and two trials of TUG test on two days apart.

Results: High test-retest reliability between days was found for the 6MWT (ICC=.97) and for the TUG test (ICC=.96). Performance values were significantly higher on retest: 6MWT (day1: 314.0±109.7m; day2 329.4±109.7m), TUG test (day1: 13.3±4.7s; day2: 12.7±4.5s). Strong and negative correlations were observed between 6MWT and TUG test (day1: rS=-.92, day2: rS=-.90). The distance walked in the 6MWT was assessed and functional ability k level codes, showing an increase from K3 to K4 level (P<.001).

Limitations: A restricted sample of patients was used in this study.

Conclusions: The 6MWT can be considered as a reliable instrument to measure functional capacity in persons with transfemoral amputation. Subjects that walked longer distance in 6MWT performed the TUG test in less time. The TUG test should be used for assessment of physical mobility, postural control, set of transfers, level walking, and turns in transfemoral amputees.

Introduction

The reported prevalence of programmed amputations in Portugal are 717 amputations per year, as result of dysvascular disease (66%), diabetes mellitus (20%), trauma (13%), malignancy of the bone and joint, and congenital malformations (1%).[1] In United States the prevalence of amputations are 133.235 per year, showing similar percentages as found in the Portuguese population, namely, 62% for dysvascular disease, 21% for diabetes mellitus, 16% for trauma and 1% for bone and joint malignancy and congenital malformations.[2-4]

Transfemoral amputation is a common procedure in vascular surgery, and results in permanent disability and impairment, reducing the capacity for productive activities amongst individuals of all ages. [5] The adaptation to this new life reality is

prolonged, multifaceted and involves a permanent physical and psychosocial adjustment.[6]
Candidates for prosthetic fitting need to be identified as suitable for functional prosthetic fitting and then for appropriate components selection, so that the patient can be supported in achieving optimal function for their circumstances. Usually, the classification of the functional abilities of lower-limb amputees is done by the Common Procedure Coding System, using code modifiers (K0, K1, K2, K3, K4) as a 5-level modified functional classification system (MFCL) based on the Healthcare Care Financing Administration.[7] This system might predict the ability of the amputees subjects to ambulate with a prosthesis and later to the rehabilitation programmes efficiency.[8,9]

The main goals for a subject undergoing a rehabilitation program after lower-limb amputation are the improvement of function especially mobility, and successfull re-integration into the community, which must be effective and at same time cost efficient. The effectiveness of these programs is assessed in terms of the ability to walk independently in the community, as well as the maximum functional independence achieved by the subject.[10]

The most important functional assessment for lower-limb amputees is that the assessment of walking capacity, which is associated with the level of amputation and the physical condition of the individual. Several reviews of multiple outcome measures have summarised out that walking speed and distance are commonly recorded following lower-limb prosthetic fitting, and can be measured by fixed distance or timed walking tests, namely, "L" test, TUG test, 10-m walk test, 2MWT and 6MWT.[11-12] These types of tests are considered as a gold standard measure for lower-limb amputees showing good to high test-retest reliability.[12-14] Moreover, Free of charge and practical tests should be preferred to measure functional parameters of the community-dwelling amputees. The 6MWT is cost-effective, technically simple to perform, safe and a sub-maximal exercise test.[15-18] Currently, the 6MWT is the most commonly used walk test,[16] to assess aerobic capacity in various settings and is strongly associated with functional capacity "able to do" and performance "really do",[11,13,19] and is also an useful prognostic tool,[16] reflecting the ability to perform activities of daily living that require sustained aerobic metabolism.[20] It was first used as a standard test in the clinical settings of cardiopulmonary diseases,[21-23] and is used in many other conditions and disorders.[22,24-27]The 6MWT showed a high test-retest reliability in patients with heart failure,[28] or with associated comorbidities including diabetes and hypertension,[17] as well as in individuals diagnosed with fibromyalgia.[25]

Initially developed by Mathias,[30] the TUG test measures physical mobility, balance, and locomotor performance in elderly people with balance disturbances.[31] This test was further used in unilateral lower-limb amputees, showing excellent reliability with correlation coefficients for tests of intrarater and interrater reliability, .93 and .96, respectively.[32] The TUG test measures most of the manoeuvres required for basic mobility and was shown to have high correlation values with walking speed tests.[13,31,32]

In literature, similar studies related to transtibial amputation[13,33] and lower limbs amputees were found[28,35]. However to the authors' knowledge, previous studies investigating the reliability of 6MWT in patients only with transfemoral amputation were not performed.

The purposes of this study were: (1) to determine the within two days test-retest reliability of the 6MWT and the TUG test in persons with transfemoral amputation; (2) to identify the performance of the 6MWT between participant groups stratified by functional ability and BMI levels across test and retest; (3) to analyze the relationship between the distance of walking in the 6MWT and the time to perform the TUG test.

Methods

Sample

Thirty subjects with unilateral transfemoral amputation were, according to inclusion criteria, randomly recruited from hospital databases, a specialized amputees rehabilitation center and prosthetic manufacturers from Lisbon. The causes of amputation included trauma, diabetes, vascular problems and tumor. The inclusion criteria was according the following: unilateral transfemoral amputation, walking independently with no walking aids but with a prosthesis in the community, absence of skin breakdown of the residual limb in the past three months, well-controlled medical conditions, no recent illness, no hospital admissions in the last three months, no severe mental or psychiatric disease and that the subject was able to understand the protocol instructions. Patients with upper limb amputations were excluded. Clinical and demographic characteristics were recorded through questionnaire and summarized in Table 1. All participants gave their written informed consent. The experimental protocol was approved by the Ethical Committees of the Faculty of Human Kinetics, Hospital and Rehabilitation Center.

Study Design

A test-retest study design was used and the tests being held 48 hours apart. On the first day, the subjects performed firstly 6MWT, and after a 20 min interval, two trials of the TUG test. To minimize the influence of fatigue, the TUG test was performed with a two minutes rest time between each trial. On the second day, the tests were performed in the same order and at the same time as on the first day.

Study Measures

Functional classification levels
Functional ability levels of lower-limb amputees were classified according to the 5-levels of modified functional classification level MFCL.[7]

Six-minute walk test

The 6MWT was conducted according to the American Thoracic Society (ATS) guidelines[23]. Therefore, prior to each trial, subjects were instructed to walk in a 30m corridor with cones marking the distance according the following instructions: "The object of this test is to walk as far as possible for 6 minutes. You will walk back and forth in this hallway. Six minutes is a long time to walk, so you will be exerting yourself. You will probably get out of breath or become exhausted. You are permitted to slow down, to stop, and to rest as necessary. You may lean against the wall while resting, but resume walking as soon as you are able". On both trials, the researcher provided standardized words of encouragement to each subject at each minute mark.

During the 6MWT, heart rate was monitored continuously with a Polar F-55 watch. Heart rate, blood pressure and oxygen saturation, measured with pulse oximeter (Accutorr Plus®), were also recorded before and after the 6MWT, as well as perceived exertion using the modified Borg scale (CR-10),[36] and residual limb pain intensity with the numerical rating scale (NRS).[37] The total distance was measured in meters. All data collection was made by a single researcher.

TUG test

The TUG test was performed according to the author's recommendations and subjects practiced the test once in order to become familiar with it.27 Each subject was sitting correctly in a chair with arms (seat is 46 cm from floor) and the subject's back be resting on the back of the chair. The chair should be stable and positioned such that it will not move when the subject moves from sitting to standing. A piece of tape or other marker was placed on the floor 3 meters away from the chair. The following instructions were given to the subjects: "The purpose of this test is to measure the time you'll take to stand up, walk 3 meters, turn around, walk back to the chair and sit down. On the word "GO" you'll do the test as you have just been instructed. Walk at your regular pace." The time taken to complete the TUG test was recorded and the average of two trials was used for statistical analysis.

Data Analysis

Descriptive statistics (means, standard deviations, range, number and percentage) were used for basic data analysis. Values are expressed as mean±SD, unless otherwise indicated. Data were tested for normality with the Shapiro-Wilk test. Intraclass correlation coefficients [ICC3,1, was chosen according Cheng],38 and their 95% confidence limit (CI) were computed to determine the reproducibility of the measurements between days. The ICCs were classified as: high reliability (0.90-0.99), good reliability (0.80-0.89), fair reliability (0.70-079), or poor reliability (<0.70).39 Test-retest comparisons were computed using paired-samples t-tests or Wilcoxon signed ranked test, as appropriate. Spearman's rank correlation coefficient (rS) was used to determine the strength of the relationships among walked distance in the 6MWT and each of several measures in research.

Peak heart rate (PHR) (% age-predicted maximal) was measured as [PHR during the 6MWT/(220-age)] x 100% and the mean arterial pressure (mmHg) as [diastolic pressure + (systolic pressure-diastolic pressure)/3], where diastolic and systolic pressures were measured after trials.

Since K-Level and the BMI classification are relevant variables in persons with transfemoral amputations, two mixed between-within subjects ANOVA were carried out to assess the effect of the level of each categorical variable on walked distance in the 6MWT, across test and retest.

Statistical significance was set at an alpha level of .05. All data analysis was performed by using statistics software package (SPSS Statistics 17.0 for Windows, SPSS Inc, Chicago, USA).

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Results

Demographic and Clinical Data

Demographic and clinical characteristics of the participants are presented in Table 1. Thirteen subjects (43%) presented medical comorbidities, where seven (23%) reported additional cardiovascular clinical diagnoses (four high blood pressure and high cholesterol, three arrhythmia), three (10%) had type 2 diabetes, one asthma, one epilepsy, and one HIV. Thirteen subjects had regular controlled medication. Three participants (10%) were classified as underweight, fifteen (50%) as normal range, and twelve (40%) as overweight (seven pre-obese, four obese class I, one obese class III); according the BMI classification, proposed by the World Health Organization.[40]The majority of subjects were either full time or part-time employed, four who were retired.

Six-Minute Walk Test

The distance of 6MWT on the second day was plotted against the respective first day distance with a 45° line through the origin [Figure 1(A)]. The ICC computed was .97 (95% CI .89-.99), indicating high reliability.
A significant increase in the distance of 6MWT on the second day was found (day1: 314.0±109.7m; day2: 329.4±109.7m; P<.001, Wilcoxon signed ranked test), with a large effect size (r=.51) [Figure 1(A)]. Referring to the average speed, the mean increased from 0.87±0.3m/s to 0.92±0.3m/s.

All subjects completed the 6MWT according to the ATS guidelines,[23] showing normal PHR, mean arterial blood pressure and oxygen saturation values. PHR (day1: 70.8±11.6%; day2: 71.2±11.0%) and arterial blood pressure (day1: 100.7±12.9mmHg; day2: 101.0±17.4mmHg) showed no statistically significant difference the two days.
Perceived exertion and perceived residual limb pain showed no significant differences between test and retest. The relationship between the recorded distance of 6MWT and each perceived exertion rating change were assessed, and no significant correlations were found. Low correlations were detected between pain change and perceived exertion change (day 1, rS=.65, P<.001; day 2, rS=.44, P=.016).

Functional Classification and BMI Levels Related to 6MWT

According to K-Level, K4 was presented by fifteen subjects (50%), K3 by thirteen (43.3%), and K2 by two (6.7%). Significant and positive correlations between 6MWT distance and K-Level were found on both days (day1: rS=.85, P<.001; day2: rS=.85, P<.001). A mixed ANOVA was conducted to assess the effect of the different K-Level on walked distance, across test and retest (since all participants except two, were classified with K3 or K4, only those levels were considered for analysis). No significant interaction between functional level and days (Wilks Lambda=.99, F1,26=.19, P=.67) was found. There was a substantial main effect from test to retest (Wilks Lambda=.67, F1,26=12.8, P=.001, partial eta squared=.33), with both K-Levels showing an increase in distance The main effect comparing the two functional levels was also significant (F1,26=57.16, P<.001, partial eta squared=.69), suggesting effective difference between the levels (K3 and K4) [see Figure 2(A)].

The relationship between distance of 6MWT and BMI level was computed for each day, but no significant correlations were found (day1: rS=-.33, P=.08; day2: rS=-.28, P=.14). A mixed ANOVA was carried out to assess the effect of the different BMI level on walked distance, across test and retest (since only three participants were classified as underweight, this level was not included). No significant interaction between BMI level and days (Wilks Lambda=.99, F1,25=.26, P=.61) was found. There was a significant main effect from test to retest (Wilks Lambda=.54, F1,25=21.20, P<.001, partial eta squared=.46), with individuals classified in both BMI levels showing a increase in distance from test to retest. The main effect comparing the two BMI levels was also significant (F1,25=13.31, P=.001, partial eta squared=.35), suggesting a higher difference in walked distance between normal and overweight subjects [see Figure 2(B)].

Timed Up & Go Test

The TUG test time on second day was plotted against the respective first day time with a 45° line through the origin [Figure 1(B)]. The ICC computed was .96 (95% CI .87-.98), indicating high reliability.

The between days comparison of the TUG test showed a significant learning effect from the first to the second day (day1: 13.5±4.7s; day2: 12.8±4.4s; P=.001, Wilcoxon signed ranked test), with a large effect size (r=.40) [Figure 1(B)].

Six-Minute Walk Test and Timed Up & Go Test

Figure 3 shows the scatter plot of the time spent in the TUG test versus the distance walked in the 6MWT for test (A) and retest (B). The correlations between distance and time were strong and negative (day1: rS=-.92, P<.001; day2: rS=-.90, P<.001), indicating that higher walked distances were associated with lower time to complete the TUG.

Discussion

The total prevalence of comorbidities in the subjects was considerable (n=13), most of them associated with obesity, because 8 of the 12 overweight subjects showed cardiovascular diagnoses predominantly or diabetes.

Considerable change (outlier) was observed in two subjects in the 6MWT, and in one subject in the TUG test, that might be explained by a poor physical capacity, as reported by one of the participants on the first day.[13]

A high intraclass correlaction coefficient (ICC=.97) between distances walked on the two days was obtained, suggesting that the 6MWT is a reliable test for transfemoral amputees. Similar results were reported in several studies, namely in within-day test-retest with transtibial amputees (ICC=.94),[13] in within two days test-retest with transtibial amputees (ICC=.79-.83)[33] in within-week test-retest with lower-limb amputees (ICC=.97),[14] and in within-week test-retest with older adults (r=.95).[26]

In the current study, the participants showed better performance on the 6MWT (314±110m) than other patient groups, for exemple in spinal cord injury (205±120m)[41] or chronic cerebral vascular accident patients (202±88m),[42] but worse than traumatic brain injury (403±105m),[43] unilateral lower-limb amputation (332±115m)[14] and healthy elderly adults (603±178m).[44] We found a learning effect in the 6MWT with a mean improvement of 15 meters on the retest. This learning effect has been also found in previous studies.[13, 23, 33, 34]

Several factors influence the distance walked distance, such as age, height, body weight, gender, comorbidities and functional ambulation ability. In fact, a strong association was found between two functional classification levels (K3 and K4) and the walking distance on the 6MWT on both days, indicating that two K-Level descriptors effectively discriminate the function levels of transfemoral amputees, as previously stated for lower-limb amputees.[11] However, some subjects showed overlap in the distance ranges, as previously reported.[11] The 6 minutes distance walked mean recorded for K3 and K4 levels improved from day1 to day2, as shown in Figure 2(A). These results were similar when compared with the walking distance obtained for unilateral lower-limb amputees (K3: 299±102m; K4: 420±86m), nevertheless, these patients had different levels of amputation (from ankle disarticulation to transpelvic amputation).[11]

A significant difference of approximately 130m in the 6MWT between the normal and overweight levels was observed (test: 131.3m; retest: 127.2m). A prosthesis leads to unequal load distribution between the 2 limbs; prosthetic and remainingduring ambulation, also it is more effortful, can be painful, is more challenging too and therefore these subjects adopt a more sedentary lifestyle leading to an increased weight.[2]

Higher body weight was also observed to be associated with shorter 6-minutes walked distance.[45] Being overweight (40% of the participants of our study) led to a lower physical function, this might indicate the need for the implementation of secondary prevention programs with transfemoral amputation patients, specifically, promoting an active participation in regular exercise, as well as, a correct nutrition control or advice.[46]

In the current study, the walking speed achieved in the 6MWT (0.87±0.3m/s) was lower than the walking speed found on a study with transtibial subjects (1.51±0.2m/s).[47] The task of walking, requiring balance control in addition to muscle strength and coordination, is much harder to accomplish for transfemoral amputees due to the absence of two joints of the lower-limb and related agonist and antagonist muscles, rather than the transtibial subjects who have the knee joint preserved.[46] No differences in PHR, mean arterial blood pressure, residual limb's pain neither in the perceived exertion were found between the two trials as previously observed.[13] Furthermore, no association was observed between the walking distance achieved and both rating scales, suggesting that neither the pain nor the perceived exertion influenced this outcome measure. Similar results were obtained with transtibial amputees That participated in three trials on the same day[13]

A high intraclass correlation value for the time spent in the TUG test between the two days was obtained (ICC=.96), indicating high reliability as observed in previous studies like a within-two weeks test-retest (ICC=.93),32 or a within-week test-retest both with lower-limb amputees (ICC=.88).[14]

Performances in the TUG test in the current study (test: 13.3±4.7s; retest: 12.7±4.5s) were similar to the one's obtained in lower-limb amputation (test: 12.3±4.5s; retest: 13.0±5.6s),[14] but better than found in transfemoral amputations study (28.3±12.2s). Normative values for TUG test (9.4±16.9s) were obtained from a meta-analysis including multiple studies with elderly individuals (60-99 years) without gait disturbances, which were lower than our results.[32,47] The absence of two joints of the lower-limb, makes walking a difficult task to achieve by transfemoral amputees as a result of show a poor motor function and postural motor control and therefore explain lower results in our study.

Strong and negative correlations were observed between 6MWT and TUG test. Similar results were obtained in a stroke population (rS=-.96).50 A moderate correlation was reported in a transtibial population (r=-.76).13 All these results suggest that subjects who walked a longer distance in 6MWT performed the TUG test in less time.

Study Limitations

Only two BMI levels (normal and overweight) were considered when relating those with 6MWT, as ANOVA technique implies representative dimension on each level and in current study there were three underweight subjects. Further studies with larger subject number at this level may be advisable. Similar limitation was found in the relationship between K-Levels and 6MWT, where two subjects classified with K2 were excluded and just two levels of functional ability (K3 and K4) were used in mixed ANOVA.

Conclusions

The present study indicates that the 6MWT should be considered a reliable instrument to measure functional capacity and mobility in persons with transfemoral amputation. Excellent reliability within days TUG test-retest was observed, indicating that this test is appropriate for assessing physical mobility, postural control, set of transfers, level walking, and turns in amputees. Subjects that walked longer distance in 6MWT performed the TUG test in less time. Since higher BMI was related to poor walking ability, increased physical activity and nutritional support control should be recommended for this specific population.

Table 1: Demographic and Clinical Data of Participants (N=30). SD=Standard Deviation

Characteristics	Mean ± SD	Range	N	(%)
Age (yr)	44.0 ± 17.3	18 – 80		
Height (cm)	169.9 ± 7.6	159 – 189		
Weight (kg)	71.7 ± 15.2	45 – 110		
BMI (kg/m^2)	24.7 ± 5.3	17.5 – 40.4		
Gender				
Male			25	(83.3)
Female			5	(16.7)
Race				
White			25	(83.3)
Black			4	(13.3)
Other			1	(3.3)
Years with prosthesis (yr)	9.6 ± 10.6	1 – 34		
Reason for amputation				
Trauma			17	(56.7)
Vascular			7	(23.3)
Diabetes			3	(10.0)
Tumor			3	(10.0)
Side of amputation				
Right			17	(56.6)
Left			13	(43.3)

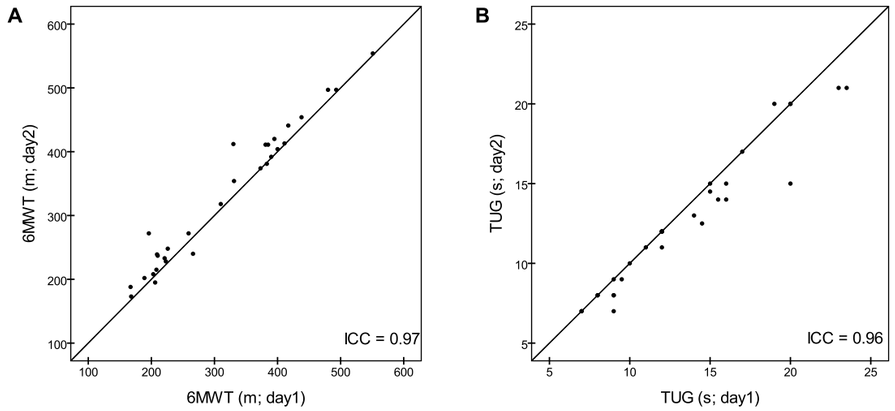

Fig 1. Relationship between retest and test for (A) 6MWT, (B) TUG test, with a 45º line through the origin.

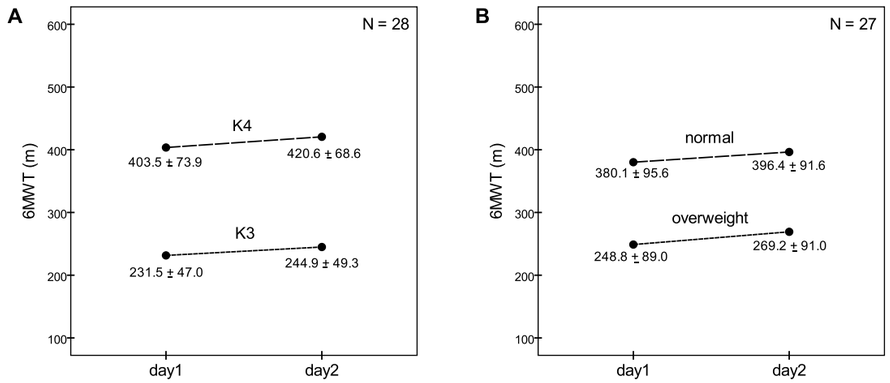

Fig 2. 6MWT by (A) level of functional ability, (B) level of BMI, across test and retest (values are expressed as mean±SD).

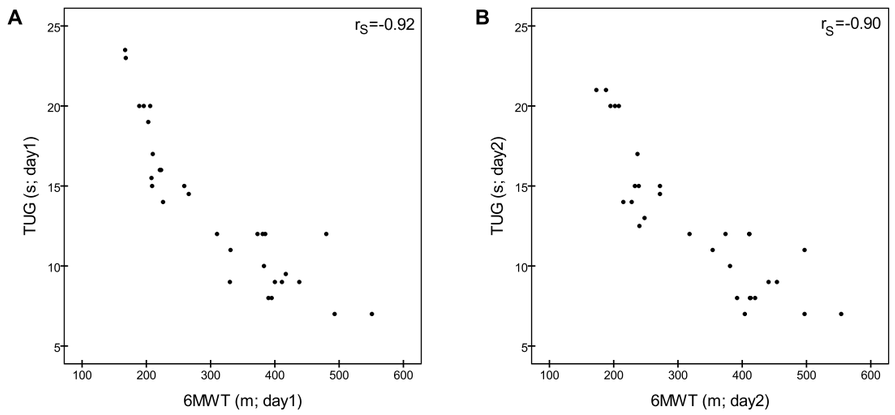

Fig 3. TUG test versus 6MWT for (A) test, (B) retest.

Alexandre Coelho MSc; Margarida Espanha PhD; Paula Bruno PhD

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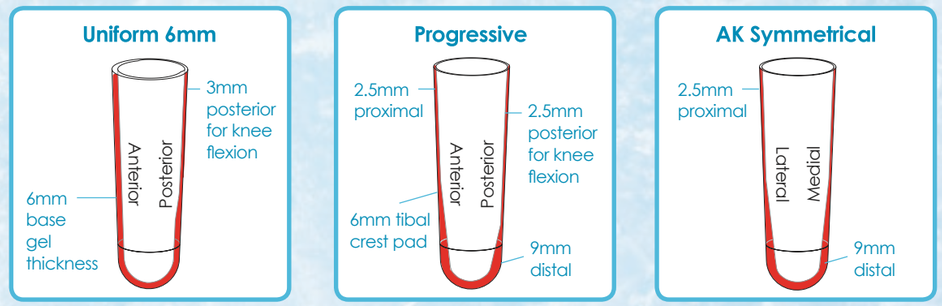

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A study to compare the use of a Removable Rigid Dressing with a Soft Dressing for Trans-Tibial amputation

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Introduction

- There are many types of dressing for trans-tibial amputation, but consensus on the most effective post-operative dressing has been lacking.
- The literature supports that use of RRD (Removable Rigid Dressings) results in significantly accelerated rehabilitation times.
- Schon et al found that patients using the prefabricated pneumatic prosthesis (AirLimb system) had significantly fewer postoperative complications (16%) compared to those managed with soft dressings (65%).
- The purposes of the RRD are to:
  1. Control oedema.
  2. Allow shaping of the residual limb prior to fitting
  3. Allow easy access for wound inspection and dressing
  4. Help prevent or limit a knee flexion contracture
  5. Protect the residual limb from trauma following a fall.

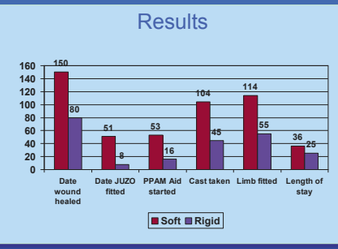
Methods

- The guidelines used were the NSW Amputee Care Clinical Guidelines which recommended that a rigid dressing be applied immediately (within 20 minutes of completing surgery) in patients with trans-tibial amputation.
- We devised and implemented a protocol for application of RRD in our hospital which included when the RRD is to be worn and removed. This was accepted by the vascular and orthopaedic department at Cumberland infirmary (CIC). 1 vascular (4/6) and 1 orthopaedic surgeon (2/6) carried out all the amputations using the RRD.
- 20 patients (14 male, 6 female; 18 vascular, 2 orthopaedic) underwent trans-tibial amputation between October 2010 and February 2012 who attended the DSC at CIC. 6 patients had RRD fitted and 14 patients had Soft Dressing (SD).
- The data collected from these patients was audited and the outcome measures compared.

Results

5/6 RRD patients healed within 4 months, compared to 8/14 SD patients. 5/6 RRD patients began Ppam aid use within 1 month, compared to 3/14 SD patients. All RRD patients were fitted with a prosthesis within 3 months, compared to 8/14 SD patients. 4/6 RRD patients were discharged home within 3 weeks, compared to 2/14 SD patients. Average length of stay (LOS) for RRD patients was 25 days, compared to 35 days for SD patients. 5 patients had a fall post operatively: 3 patients with RRD who suffered no injuries, 2 patient with SD of which 1 subsequently required trans-femoral amputation.

Results



Össur Rigid Dressing (ORD)

Protocol

Discussion

Total care of TT amputees requires not only skilful surgical techniques to achieve primary wound healing, but also comprehensive rehabilitation techniques to prevent stump complications that prolong hospitalization and delay a successful prosthetic outcome.

Effectiveness of the standard above-the-knee rigid dressing lasts 1 to 2 days after the cast is applied, and does not provide progressive shrinkage unless the loosened cast is changed frequently. The problem is simplified by the RRD.

Potential disadvantages include expense and bulkiness. After liaison with the infection control on cleaning issues we were able to use the dressing more than once thereby reducing the cost. The bulkiness has the advantage that it reminds the patient of the recent surgery when attempting to walk, especially at night.

Most of the studies were not statistically proven by the evidence and data of controlled trials. There are other factors that affect wound healing like surgical technique.

Conclusion

- The audit confirmed the benefits of RRD.
- One of the most important benefits of the RRD was to prevent wound breakdown and revision to TF amputation in the event of a fall.
- Only 1 out of 4 vascular surgeons used the RRD in our trust and therefore we cannot rule out the surgical technique as a variable in good outcomes.
- The audit was presented to the vascular team across both sites of the trust and they have now all agreed to use RRD in future TT amputations .We will therefore continue auditing the advantages of RRD in more depth.
- This is a very small sample. Future studies need to more accurately document and control for variables (doctor and patient.)

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Step Count Levels during Rehabilitation of British Military Amputees – A Pilot Study

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Summary

Objective: The purpose of this pilot study was to ascertain the step count levels in lower-limb amputees within the British Armed Forces, both during and away from in-patient rehabilitation. The primary question was whether the mean daily step count changed when the amputee left the controlled rehabilitation process.

Results: 10 participants completed the study. The change in step count levels between in-patient and out-patient blocks was found to be significant (p=0.004) with a mean of 2296 +/- 1045 steps per day as an in-patient and 1354 +/- 715 steps per day as an out-patient. All participants were within three years of injury and 9 of the participants who completed the study were bilateral lower-limb amputees.

Conclusion: The results indicate a statistically significant drop in step-count levels between in-patient and out-patient blocks of data. However, this data gives an indication of what step count level can be achieved by multi-trauma amputees in the first three years of injury.

Introduction

Amputees within the British Armed Forces are primarily young (18-35 years of age) and have sustained their injuries through traumatic causes. They are a relatively small population, at the present date numbering approximately 300. This is in direct comparison to the amputee population on which research in the United Kingdom is more commonly carried out; that of the National Health Service (NHS) population where in 2006/7 there were over 4500 new referrals to the prosthetic services, the median age of these new referrals was over 65 and only 7% of the population had an amputation as a result of trauma (NHS Scotland, 2009). It has been suggested that the outcomes of younger patients who undergo amputation for trauma or cancer cannot be compared with the outcomes of diabetic patients and their associated co-morbidities such as cardiac disease, peripheral vascular disease and/or renal failure as these two groups have different expectations (Attinger and Brown, 2012).

Evriviades et al. (2011) stated that the hallmark injury for the conflict in Afghanistan is a blast injury produced by the improvised explosive device (IED), which causes a heterogeneous mix of sharp, blunt and penetrating trauma, unstable physiology, complex bony and soft-tissue defect, unusual infections, limited reconstructive donor sites, peripheral nerve injuries, traumatic amputations and later, heterotrophic ossification. Nonetheless, as discussed by Tintle et al. (2010), combat servicemen are young, previously healthy, and have the potential to rehabilitate to very high levels of activity.

As discussed by Dudek et al. in 2008, accurate monitoring of ambulation levels has the potential to facilitate better care of the amputee by assisting clinicians and researchers to prescribe and choose therapies, measure the effects of interventions, choose the most appropriate prosthetic components and predict post-amputation abilities. There is, therefore, a need to obtain objective measurements of the amount of activity carried out on a daily basis by military amputees to facilitate the Prosthetists choice of componentry and the clinical justification for funding. This could also potentially direct future prosthetic research and development and indeed more accurately direct the amputee rehabilitation programme.

Method

A convenience sample was used that utilised all of the mobilising lower-limb amputees admitted to the rehabilitation centre between Dec 2011 and March 2012, who were interested in the study and met the inclusion criteria.

Inclusion criteria:

•Participants were current serving military personnel with at least one lower limb amputation.

•Admitted to the Complex Trauma Team at DMRC Headley Court for rehabilitation.

•Participants were more than one month post delivery of primary prosthesis/prostheses. This time-scale was used to facilitate the fine-tuning of initial fit and comfort of the prosthetic socket, and allow the training required to enable the amputee to start using the prosthesis/prostheses.

•Where the participant was a unilateral lower-limb amputee, the remaining leg had to be able to at least partially weight-bear to allow walking.

A Long-term Activity Monitor 2 (LAM2^{TM}) was fitted to each set of prostheses used by each participant during a normal Prosthetics appointment. The amputees then continued to use their prostheses as normal for two weeks during the admission period and the consecutive two weeks of home leave. The LAM data was downloaded at the next Prosthetic appointment following this time period.

Results

All amputees accepted onto the study sustained injuries as a result of improvised explosive device (IED) blasts over the last three years. All were male and walked independently without walking aids, with the exception of one unilateral trans-femoral amputee (TFA) who used a walking stick. Of the 20 participants accepted onto the study, a drop-out rate of 50% was seen due to short-notice surgery, illness, changes to admissions, five faulty monitors and one participant having their monitor confiscated at an airport!

The following table describes the demographical data of the 10 participants:

	Age (years)	Time since Injury (months)	Time on Prosthesis (months)	Original height (cm)	Body Mass (kg)
Mean+/-SD (range) for participants	27+/-5 (20-35)	17+/-9 (2-30)	14+/-8 (1-24)	181+/-6 (172-190)	79+/-10 (56-91)

Those participants who completed the study were:

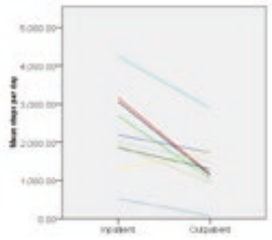
•One single transtibial amputee (TTA)

•Four bilateral TFA or knee disarticulation amputees (KDA)

•Two bilateral TFA/TTA

•Three triple amputees; two bilateral TFA + an upper limb amputation, one TFA/TTA + an upper limb amputation

The following ladder plot shows each participants mean in-patient and out-patient step counts:



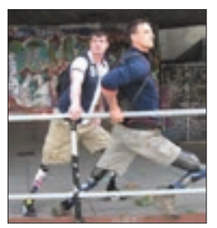
The paired t-test calculation for in-patient versus out-patient pairs of data showed significantly more steps were taken as an in-patient than as an out-patient (p=0.004). On average, 942 +/- 771 more steps were taken as an in-patient (2296 +/- 1045) than as an out-patient (1354 +/- 715).

Of the 10 participants in the study, five had a clinically significant drop of 50% or more of their mean steps per day. Of those five participants, three had reported issues that they felt had caused a decrease in the amount they were doing; one with a bruised residual limb, one doing an adventurous training holiday and one with an office job.

Discussion

Although this pilot study only analyses step count, it does call into question some of the alternative physical activities that should also be considered when discussing functional outcomes of rehabilitation. This was demonstrated by the findings that one participant was already using running prostheses and went adventurous training during his hospital sick leave; another amputee went skiing during his hospital sick leave; whilst another participant returned to his unit to do an office-based job.

It must be remembered though that step count levels are only a small part of a complicated picture with regard to functional outcomes in this patient population. However, this pilot study does begin to give some indication of the step count which young, traumatic, often bilateral amputees can achieve during their first three years after injury.



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SPARG

"Early Post-operative Management of the Lower Limb Amputee – An MDT Approach"

We held our first SPARG conference in Dundee in June and it was a great success.

(Tay Bridge, Dundee)

Over 50 delegates - physios, prosthetists, vascular consultants, nurses, podiatrist and OT's – from across Scotland attended for an information packed day with plenty chance for networking. Glasgow University prosthetic students provided us with 10 posters from their final year projects.

Rep stands from Ossur, Ottobock, Juzo, Paterson Medical, Steepers, Molnlycke Healthcare, Crawford Pharma, Ortho Europe, SPARG & BACPAR were well attended during the breaks. These provided a range of products relevant to the day including wound dressings, balance / rehab equipment, PPAM aid, prosthetics, shrinker socks…..

Abi Mackriell presented the recent SPARG work looking at how different models of care affect rehabilitation outcomes for lower limb amputees in Scotland. It was concluded that specialism, use of post-op rigid dressing, onsite prosthetic centres and time / frequency of physiotherapy all had a positive effect on outcome for the patients in relation to SPARG milestones e.g. days to cast, length of IP stay etc.

Catriona Mawdsley and Katy Bryce gave an update on their experience in setting up an in-reach physiotherapy service to Edinburgh Royal Infirmary which showed significant reductions in number of days to commencing compression therapy, use of EWA and days to casting for prosthesis.

Guidance for the MDT on the management of post-op residuum oedema in lower limb amputees was presented by Mary Jane Cole. A range of modalities was concluded to be beneficial, namely the post-op rigid dressing, PPAM aid, stump shrinkers and wheelchair stump rests.

Professor Graham Leese, specialist Diabetologist in Ninewells Hospital, Dundee gave an excellent presentation on "Care of the Remaining Limb in Diabetes". All patients in Scotland with diabetes should be identified and risk stratification (SCI-Diabetes database) carried out – 83% more likely to develop a foot ulcer if in the high risk group. Foot screening programmes & self care management (my diabetes my way); podiatry & orthotics support were all discussed. Interestingly in a snapshot of IP admissions in Ninewells hospital, 20% of all in-patients were found to have active foot disease.

BACPAR Journal Issue 41, Autumn 2014

A new guideline for the treatment and prevention of acute phantom limb pain has been developed in Dundee and was presented by Liz Colquoun, Acute Pain Specialist Nurse.

Sciatic +/- femoral nerve blocks are routinely used and topped up for a longer period. There are specific guidelines for the additional medications required and the results have been excellent with 90% experiencing mild or no PLP at 7 days post-op.

Stuart Suttie, our new Consultant Vascular Surgeon in Dundee has been working with the University of Dundee medical school to develop teaching aids for students. He gave a detailed presentation including lots of photos and videos of transtibial amputation surgery, showing the important stages of the operation, to ensuring a good quality stump.

Maggie Uden's presentation on the Roehampton Stump Score followed on perfectly - stump quality is one parameter which can affect prosthetic fitting and rehab milestones. Stumps were graded 0-5-10 over 10 categories. It was found that the items scoring lowest in the audit were bone end, wound, length of stump and muscle cover. In general scores were high so the plan is to review and re-weight the scoring system.

The afternoon was concluded by a very personal, frank and moving account of the experiences of Olivia Giles – she contracted meningitis and lost all 4 limbs a few years ago. She discussed her experiences of her care and treatment in the NHS highlighting good practise and also the occasional negatives of her lengthy experience of various members of the MDT.

Louise Whitehead

Compliance to the BACPAR contra-lateral foot care guideline within the Amputee Rehabilitation Service at Russells Hall Hospital, Dudley, West Midlands - Audit 2012

L. Parkes, Senior Physiotherapist

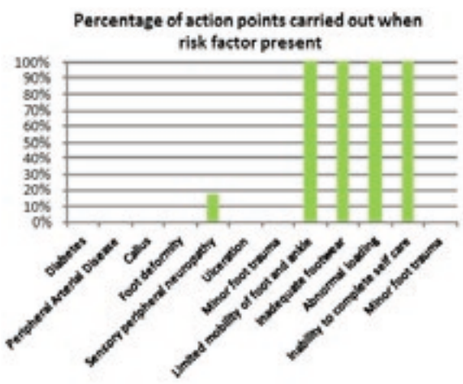
Background and Aims

The contra-lateral foot care guideline was published by BACPAR in 2009. It aims to provide guidance on the risk factors to look for and the action to be taken if the patient is found to be at risk, with a view to preventing a deterioration, and possibly amputation, of the remaining limb. This audit was designed to investigate if the current physiotherapy assessment and treatment process at Dudley Group of Hospitals complies with the recommendations of the guideline.

Method

A retrospective analysis was conducted of all lower limb amputations carried out between January 2010 and July 2011. There were 58 amputations performed, of which 22 met the inclusion criteria. The inclusion criteria were: patients who had a transfemoral, transtibial or knee disarticulation amputation and attended Russells Hall Hospital for outpatient physiotherapy for at least 3 months. The exclusion criteria were patients whose amputation resulted in them becoming a bilateral lower limb amputee.

Results



Guideline[1]

Risk Factors	Action Point
Diabetes	• Ensure patient is under review of appropriate diabetic specialist • Minimise all modifiable risk factors
Peripheral Arterial Disease	• Assess PAD status • Ensure patient is under the care of a vascular specialist
Callus Foot deformity Sensory peripheral neuropathy Ulceration Minor foot trauma	• Educate patient regarding risk factors and foot care • Ensure patient under the care of appropriate multidisciplinary team foot care specialist • Refer to specialist service to assess foot care needs • Visual and sensory assessment of foot
Limited mobility of foot and ankle joints	• Ensure patient under care of appropriate multidisciplinary team foot care specialist • Refer to specialist service to assess foot care needs • Assess active and passive range of movement of foot and ankle and treat accordingly
Inadequate footwear	• Ensure patient under care of appropriate multidisciplinary team foot care specialist • Refer to specialist service to assess footwear needs
Abnormal loading of limb during mobility and activity	• Assess mobility and activity and adapt accordingly • Optimise prosthetic stability and gait
Inability to complete self care including social behaviour, cognition and vision	• Assess and address ability to self care
Minor foot trauma and environmental hazards	• Assess and minimise environmental hazards

Conclusion

The results show that as a service we are not fully adhering to the guideline. With certain risk factors, such as abnormal loading and limited mobility of foot and ankle joint, we carried out the action points in 100% of cases. However, in other areas such as diabetes and peripheral arterial disease 0% were carried out. It is apparent that the areas scoring 100% are more therapy focussed, and are factors already assessed within our amputee integrated care pathway. The risk factors that scored 0% were factors such as diabetes, peripheral neuropathy and ulceration. These are areas which require medical management, rather than therapy intervention, which may be why the action points were not carried out.

Action Plan

- Review research used in guideline to clarify risk factors in more detail
- Make action points specific to our location i.e. local services and MDT available.
- Identify training needs of new members of staff to assess for risk factors
- Design an assessment sheet to be included in care pathway documentation to assess risk factors and prompt to complete action points.
- Carry out a re-audit

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BACPAR North West Regional Study Day

On the 14th July, 16 Physiotherapists and assistants attended the North West Study day at the Manchester Royal Infirmary. This was the first regional study day that myself and fellow North West regional rep Andrew had held since coming into post at the end of last year.
We had various speakers covering a range of interesting and relevant topics, followed by feedback from issues arising at the Executive Committee meeting in March. Presentations included Prosthetic Alignment and Deviation, An Intro to Graded Motor Imagery (with a patient present for practical/feedback element), Podiatry and off-loading footwear and also a Review of the Vascular Guidelines.

One of the founders of MANFIT (http://www.manfit.org), Margaret Tyson, also joined us and spoke about the benefits of their exercise group for amputees/prosthetic users over 18years old. They are based in the Manchester area and provide subsidised access to various physical activities throughout the city, such as non-contact boxing, wheelchair tennis, gym facilities and swimming. Margaret also explained how there are no other Amputee exercise groups this accessible within the region and throughout most of the country.

There was even time for some peer discussion, which lead to a lengthy and enlightening comparison about the regions reorganisation of the Vascular services and Amputee rehab. This lead onto a discussion of the difficulties the Amputee Rehab teams are facing, such as Community follow up, as a result of this reorganisation.

There was great feedback from all that attended, including ideas for future regional study days. A large proportion of the topics requested will be covered by this year's exciting program at the BACPAR National Conference in November. Many of the attendees felt that practical examples and case studies would be of benefit to our peer learning and discussion.

All in all, a great day out with some fantastic networking and peer support! Well done North West, same turn out for Novembers National Conference please!

Rachel Humpherson BACPAR North West

What are the Main Treatments for Phantom Limb Pain after Amputation in the United Kingdom?

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Introduction

Phantom Limb Pain (**PLP**) is a feeling perceived after amputation and may be triggered by episodes of residual limb pain[1,2]. Symptoms include cramping, burning, tingling and shooting pain[3].
50-83% of amputees experience PLP [2,4,5,6,7] therefore highlighting the importance of identifying how PLP is managed.
PLP is a multifaceted condition and in turn requires a complex treatment approach[8].
Research to date has been inconclusive in determining the most effective treatment used by physiotherapists for PLP.
This topic has been identified as a Chartered Society of Physiotherapy (CSP) research priority, highlighting the importance for further investigation into this **complex** area.

Aim

To identify the main treatments for PLP and their level of effectiveness as demonstrated and perceived by physiotherapists in the United Kingdom.

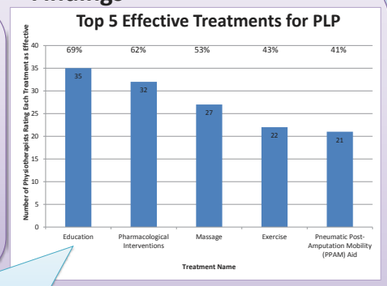
Method

An online questionnaire was designed by four physiotherapy undergraduate students. The link to the questionnaire was posted on the interactive **CSP** website. 51 members of the British Association of Chartered Society of Physiotherapists in Amputee Rehabilitation (**BACPAR**) volunteered to complete the questionnaire.
The online questionnaire allowed the recruitment of participants dispersed throughout the United Kingdom and it was also more financially viable for an undergraduate project[9].
The data was collected on Survey Monkey and analysed using SPSS version 19 software. Descriptive statistics were used to describe correlation of our results for the types of treatments used and their perceived effectiveness.

Findings

The Top 5 Used Treatments for PLP

1. **Education**
2. **Massage**
=3. **Exercise**
=3. **Pharmacological Interventions**
=3. **PPAM Aid**



Most explanations from participants in the study suggest the level of effectiveness of **Education** refer to the fact that patients are **empowered through gaining an understanding** of PLP. This in turn enables better self management of their pain.

Discussion

Educating patients about their condition is regarded as a fundamental step in pain management. **Education** was found to be the **most commonly used treatment** for PLP and also considered **the most effective**.
Additionally, treatments identified as relatively ineffective are still used by physiotherapists, which may be due to their various **psychosocial benefits** and merit further exploration.

Conclusion

The evidence suggests that **the most effective** and **most commonly used treatment** for PLP is **Education.**
The data gained from this research suggested that various methods of treatment are used for PLP, and are very rarely used in isolation.
Therefore identifying the most effective **combination** of **treatments** for PLP may provide more beneficial in future research due to the **complex nature of PLP**.

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Ackowledgements
Louise Tisdale Chair BACPAR, Penny Broomhead; Hon Research Officer of BACPAR, Members of BACPAR, Ahmed Younis[2] and Anne-Marie Hassenkamp[2].

November 2013

Identifying falls risk in Vascular patients using Timed up and Go

Miriam Hope[1], Ashish S Patel[2], Judith Partridge[3], Matthew Fuller[1].
[1] Guy's & St Thomas' NHS Foundation Trust (GSTFT) Physiotherapy Dept., [2] Guy's & St Thomas' NHS Foundation Trust (GSTFT) Vascular Surgery, [3] Guy's & St Thomas' NHS Foundation Trust (GSTFT) POPS - Proactive care of Older People undergoing Surgery

INTRODUCTION

- Altered and slower gait patterns have been suggested to increase falls risk in community dwelling elders[1].
- People aged 65 and older have the highest risk of falling, with 30% of people older than 65 and 50% of people reporting a history of falling.[2]
- Vascular patients are generally older, have slower, altered gait patterns and balance impairments, but there is conflicting evidence regarding the effect this has on falls.[3,4,5,6,7]
- Timed up and Go (TUAG) has been used in other populations to screen for falls.[8]
- There are no hospitalised vascular population specific falls screening tools available.

AIMS

- To assess the sensitivity and specificity of TUAG to identify falls risk in a vascular population using the established cut-off value of 13.5 seconds
- To find the optimal cut-off value to identify falls risk in a vascular population using TUAG.

METHODS

- Retrospective analysis of data collected over 1 year (May '11 – June '12)
- Patients undergoing pre-op Physiotherapy assessment on an acute vascular ward were studied.
- TUAG assessed using established protocol. (Clock starts from "go"; Stand up, walk 3m turn and return to sitting in chair where clock stops).
- Falls history in last 12 months subjectively reported.
- Groups dichotomised at 1 reported fall.

RESULTS

Patient Characteristics

Total data set	357
Fallers	96
Non-fallers	261

24 % falls prevalence

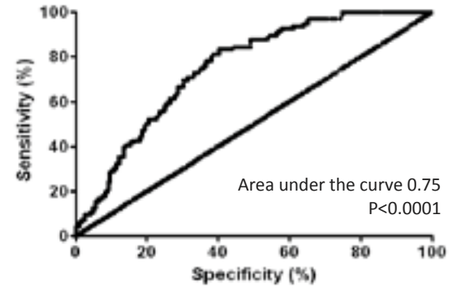
Age stats (years)	Mean	Median	Range
Complete data	73	75	32-96
Fallers	76	77	52-91
Non-fallers	72	74	32-96

RESULTS

TUAG Data (sec)	Mean	Median	Standard Deviation	Range
Fallers	32.82	23.11	33.04	10.47 - 205.29
Non-fallers	18.94	13.78	16.42	5.37 – 115.56

13.5 second cut-off value :Sensitivity 87% & Specificity 49%

Optimal cut off value: **16.05 seconds.** Sensitivity 81% & Specificity 61%



CONCLUSION

- The percentage of fallers in this population is considerably less than that of "normal" community dwelling elders.[2]
- Hospitalised vascular patients performed the test considerably slower than published age matched normative data.[9]
- 13.5secs identified 87% of fallers Correctly = sensitive to identify the fallers. However there are to many false positives = not very specific.
- TUAG time over 16.1 sec is the optimal cut off to identify falls risk in vascular patients.
- TUAG should become part of the multifactorial falls risk identification and prevention strategy for the hospitalised vascular population, allowing a targeted multifactorial intervention in line with NICE Guidelines.[2]

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