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University of Strathclyde

FACULTY OF ENGINEERING

Collaborative Training Account


SPEEAD (Sporting Prosthetics for Everyday & Elite Athletes with a Disability)

National Centre of Prosthetics and Orthotics

Sarah A. Deans and Sandra Sexton

May 2010
University of Strathclyde

FACULTY OF ENGINEERING

Collaborative Training Account


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1. INTRODUCTION

The National Centre for Prosthetics and Orthotics (NCPO) made application to the Collaborative Training Account (CTA) during August 2008. The Account’s theme for 2008-2009 was Sustainable Strategic Partnerships of Scale. The National Centre for Prosthetics and Orthotics was established in 1972 and offers training, education and research in the fields of prosthetics, orthotics and related aspects of the provision of assistive devices for those with physical mobility challenges. The National Centre is an internationally-known provider of undergraduate training and education within its field and provides vocationally-oriented courses to prosthetists and orthotists and the related healthcare professions.

The Strathclyde Collaborative Training Account was established by securing substantial funding from the Engineering and Physical Sciences Research Council (EPSRC) to provide company benefit through access to the postgraduate community and training. The Strathclyde CTA portfolio, in alignment with the University's Strategy for Excellence, has expanded considerably and encompasses a wide range of innovative Knowledge Exchange Partnerships including Masters Programmes and Research Associate Industrial Secondment (RAIS)

The SPEEAD programme leaders are Mrs Sarah Deans, Lecturer, NCPO and Mrs Sandra Sexton, Director and Head of Department, NCPO.

2. SUMMARY OF PROPOSAL

In considering a strategy for research development in prosthetics in the National Centre for Prosthetics and Orthotics, the importance of making involvement in sport more accessible to those athletically inclined became apparent. In preparation for the 2014 Commonwealth Games in Glasgow, there was also a clear need to herald a renewed focus on sport for those with mobility challenges and empower those who might never have participated to become involved. There was a desire to build an enhanced national profile in terms of expertise and research in sporting prostheses and to promote our field of prosthetics. SPEEAD continues to have two aims:

- To build the level and nature of expertise and research capacity in the wider prosthetics practitioner community
- To address a postgraduate instructional course need in the UK prosthetics practitioner community

3. OUTLINE of ACTIVITY

Originally, the SPEEAD initiative defined two areas of activity derived from the aims and objectives. A third area emerged; that of providing knowledge transfer and engagement opportunities for prosthesis-users and their professionals.

3.1 Building Research Capacity

In order to build research capacity four key activities took place during the period from October 2009 until September 2009.

3.1.1 Development of the SPEEAD network

To explain how the project had scale, the SPEEAD project initiative relied on national (UK) strategic partnerships with key organisations and individuals who are at the forefront of best patient care.

The collaboration between NCPO within the Faculty of Engineering, and The Department of Sport, Culture and the Arts within the Faculty of Education was strengthened. Thus a cross faculty and cross disciplinary collaboration at the University of Strathclyde was realised.
Externally to the University, an initial cluster of experts with complementary backgrounds and an interest in sporting prosthetics formed partnerships and became members of the steering group. Three meetings were held to plan and deliver the research and knowledge exchange activities. Each partner contributed significantly in kind to the project with the vision of improving the quality of care in the prosthesis-user population.

To attract continuing interest in the SPEEAD work, a dedicated website was established with latest news and event presentations

www.strath.ac.uk/prosthetics/research/speeadsportingprosthetics

The SPEEAD network has grown nationally and expects international growth.

### 3.1.2 Recruitment & registration of postgraduate researchers

One Research Associate working in full-time employment in industry was recruited and registered for a part-time Masters of Philosophy at the University of Strathclyde. With the SPEEAD initiative being promoted at national and international professional events, two further researchers were attracted to register. Miss Donna Fisher, Mr Jamie Gillespie and Mr Oliver Smith were registered in March 2009 with the duration of study being 48 months. Sarah Deans is supervising all three postgraduate students and has herself undertaken PhD study with the Faculty of Education and under the supervision of Professor Nanette Mutrie, Professor of Exercise Psychology.

The student topics forming the SPEEAD research portfolio are:

- Prosthetic alignment considerations in everyday and elite athletic activities: a study of a population with lower limb deficiency.
- Profiling of active individuals with lower limb deficiency: how can improvements be achieved?
- Sporting prosthetic feet: does the prescription encourage and meet the demands of competitive sport participation?
- Motivations and barriers to participation in exercise & sport for the prosthesis user population.

### 3.2 Addressing postgraduate instructional course need

The project yielded new and unique Master of Science modules requiring external experts to author course material. This material is transferrable to NCPO's current postgraduate Open Learning degree programme which attracts mainly non-UK practitioners. Topics being authored during 2010 include:

- National and international adaptive sport
- Motivations and barriers to participation in sport
- Sporting prosthetics design and innovation
- Physiology of sports participation

The National Centre also has a portfolio of nine short courses ranging from one to five days in duration. Accreditation of these shorts courses is being investigated with a proposal that a one day short course would involve ten hours of study and equate to one credit value. There is a suggestion that accumulation of credits from successful consecutive short course attendance and study could lead to the award of postgraduate certificate.
3.3 Knowledge transfer and client and professional engagement

3.3.1 Delivery of Master Class skills training events

Steering Group meetings were convened to progress the planning, organisation and implementation of two skills training events held at distinguished centres of sporting excellence in Scotland¹ and England² during June 2009. The events were designed with the user of lower limb prostheses in mind and aimed to help participants become more knowledgeable about sports for people who have lower limb absence. In addition, the events aimed to increase prosthesis users’ awareness of participation in everyday and competition level sports, increase understanding of current prosthetic issues in disability sports and enable users to experience various sporting modes through participation. A number of sporting and relaxation activities were staged at each event in which 50 users and professional healthcare staff participated. These included exercise warm-up and cool-down strategies, football, running, stationary rowing, stationary cycling, badminton, resistance training, table tennis and relaxation techniques. A questions and answers forum reiterated the talking points of the activity sessions for the participants and knowledge transfer was further consolidated by the expert faculty panel. Educational literature supplied at the events supported the participants learning (Appendix 1).

1 Murray Park Training Ground, Auchenhowie, Milngavie
2 Loughborough High Performance Athletic Centre, Loughborough University

3.3.2 Delivery of a Scientific Conference

A scientific conference was held at Hampden Park National Stadium in Glasgow on Thursday 3rd September 2009, the third event in the SPEEAD knowledge exchange portfolio. The conference was attended by 100 delegates comprising healthcare professionals, educators and researchers with the aim of exploring innovative concepts and examples of good practice in sporting prosthetics for the benefit of the user. The conference also allowed delegates an opportunity to exchange views and provide feedback on the needs of the active and athlete user. The programme included four national and international keynote speakers and two free paper sessions where eight researchers presented their work. A particular highlight of the programme was an interview and discussion forum which explored the thoughts and feelings of four people who use prostheses in everyday and higher level activities. Delegates commented “it was interesting to hear about users’ specific experience and how positive support can really have a benefit in their rehabilitation” and “the interview and discussion forum was an excellent session exploring the depth of patient experience with regards to sports participation. It was brilliant way to seek real examples and experiences of people with mobility challenges”. Appendix 2 Conference Literature.

4. IMPACT of ACTIVITY

According to the Scottish Government, projected trends suggest that the health of Scotland’s population is unlikely to rapidly improve without change in a number of key areas. Increasing physical activity is one of the objectives which need to be delivered effectively. As such the SPEEAD project also recognises this need in the population who use prostheses; the majority of those who experience amputation do so due to peripheral arterial disease. By engaging the prosthesis user and practitioner communities in the Master Classes and Scientific Conference, the programme leaders have realised the improvement in psychological and physical wellbeing in users who attended the events and responded positively in their feedback. The SPEEAD project has had the greatest impact in this area. The project leaders believe that as a world leading education and research institution, the National Centre has an educational responsibility
to fulfil this brief for the benefit of the prosthesis user population and allow maximisation of potential. By attracting three experts in prosthetics rehabilitation from high-profile external companies to study at Strathclyde, the SPEEAD initiative has proved to be a successful foundation for growth in collaborative partnerships. With redevelopment and implementation of the National Centre’s postgraduate offerings, continued growth is expected with external collaborators.

5. CONCLUSIONS and ONGOING PROJECT ACTIVITY

In conclusion, the SPEEAD programme leaders on behalf of the National Centre have enjoyed implementing an innovative programme of engagement with external stakeholders. This activity has generated two national registrations and one international postgraduate registration at the University of Strathclyde. Most importantly, the project has succeeded in raising patient and healthcare professional awareness about the importance of physical activity, exercise and sport and how achievable improvements in health and wellbeing can be implemented in a supportive peer-led environment. Ongoing activity continues to concentrate on postgraduate module development in order to attract post-qualification rehabilitation professionals to study at the University of Strathclyde. Ongoing research serves to inform of the most appropriate ways of motivating those with mobility challenges to become and sustain health benefits from being more active.
Appendix 1 Master Class Educational Pack (Glasgow Example)

**Faculty**

**SPEEAD Master Classes - Station Facilitators & Contributors**

Murray Park Training Ground, Auchenhowie, Mingavie, Glasgow

Saturday 13th June 2009

<table>
<thead>
<tr>
<th>Name</th>
<th>Affiliation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amanda Astin</td>
<td>Target Health &amp; Fitness</td>
</tr>
<tr>
<td>Penny Broomhead</td>
<td>SPEEAD Steering Group</td>
</tr>
<tr>
<td>Eilidh Brown</td>
<td>Duke of Westminster UK</td>
</tr>
<tr>
<td>Judy Candy</td>
<td>Elite Athlete &amp; Paralympian</td>
</tr>
<tr>
<td>Julian Davison</td>
<td>Scottish Disability Sports</td>
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<tr>
<td>Sarah Deans</td>
<td>University of Strathclyde</td>
</tr>
<tr>
<td>Lyndsay Clark</td>
<td>Glasgow Alpine Club</td>
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<tr>
<td>Marjorie Collesard</td>
<td>The Murray Foundation</td>
</tr>
<tr>
<td>Neil Donaldson</td>
<td>University of Strathclyde</td>
</tr>
<tr>
<td>Catkin Edwards</td>
<td>SPEEAD Steering Group</td>
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<tr>
<td>Donna Finlay</td>
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<tr>
<td>Jamie Gillooly</td>
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<tr>
<td>Richard Hinchliffe</td>
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<tr>
<td>Raymond Hurst</td>
<td>Wish of Scotland Football Club</td>
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<tr>
<td>Russell Hunter</td>
<td>Wish of Scotland Football Club</td>
</tr>
<tr>
<td>Susan Jones</td>
<td>Glasgow Alpine Club</td>
</tr>
<tr>
<td>Terry McQueen</td>
<td>Drumchapel Tennis Club</td>
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<tr>
<td>George McLeavy</td>
<td>sporstulch</td>
</tr>
<tr>
<td>David Miller</td>
<td>Strathclyde Alpine Association Curling</td>
</tr>
<tr>
<td>Ronnie Munro</td>
<td>Scotland Volleyball and Shooting</td>
</tr>
<tr>
<td>South Scotland</td>
<td>University of Strathclyde</td>
</tr>
<tr>
<td>Sandy Stewart</td>
<td>International Badminton for the Disabled</td>
</tr>
<tr>
<td>Alan Thompson</td>
<td>University of Strathclyde</td>
</tr>
<tr>
<td>Scott Gilchrist</td>
<td>The Murray Foundation</td>
</tr>
<tr>
<td>Rick McLaugh</td>
<td>SPEEAD Steering Group</td>
</tr>
<tr>
<td>Qil Smith</td>
<td>SPEEAD Steering Group</td>
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<tr>
<td>HR Smith</td>
<td>International Badminton for the Disabled</td>
</tr>
<tr>
<td>Rob Stewart</td>
<td>Inclusive Champion Sports Tennis</td>
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<tr>
<td>Gordon Wilson</td>
<td>SPEEAD Steering Group</td>
</tr>
<tr>
<td>Paul Wilson</td>
<td>Scottish Swimming</td>
</tr>
<tr>
<td>Richard Head</td>
<td>Archery</td>
</tr>
</tbody>
</table>

go to: http://www.strath.ac.uk/prospects/research/speeaddesigningprosthetics/ 

**SPEEAD Master Classes - Faculty**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Faculty Members</th>
</tr>
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<tbody>
<tr>
<td>Balance and Coordination</td>
<td>Penny Broomhead, Colin Edwards, G.R.A. Beshard</td>
</tr>
<tr>
<td>Education</td>
<td>Scott Finlay, A.M. Smith</td>
</tr>
<tr>
<td>Hearing</td>
<td>Jamie Gillooly, Linda Clark, Russell Hunter</td>
</tr>
<tr>
<td>Football</td>
<td>Raymond Hurst, Views of Scotland, Football Club for the Physically Disabled</td>
</tr>
<tr>
<td>Cycling</td>
<td>Judy Candy, Qil Smith</td>
</tr>
<tr>
<td>Table Tennis</td>
<td>Terry McQueen, Drumchapel Tennis Club</td>
</tr>
<tr>
<td>Prosthetic Considerations</td>
<td>Donna Finlay, Richard Jones, Gordon Wilson</td>
</tr>
<tr>
<td>Strength &amp; Conditioning</td>
<td>Marco Giordana, Sarah Dearns</td>
</tr>
<tr>
<td>Health &amp; Wellbeing</td>
<td>Dr. Jacqueline Sharp, Annie Allen, Rod Jones, George McLeavy</td>
</tr>
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</table>

**Information Station**

<table>
<thead>
<tr>
<th>Member</th>
<th>Role</th>
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<tbody>
<tr>
<td>Ed Brown</td>
<td>Disability Sport</td>
</tr>
<tr>
<td>Richard Davidson</td>
<td>Scottish Disability Sport</td>
</tr>
<tr>
<td>David Morgan</td>
<td>Scottish Disability Sport</td>
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<tr>
<td>Richard Vello</td>
<td>Archery</td>
</tr>
<tr>
<td>Paul Wilson</td>
<td>Archery</td>
</tr>
</tbody>
</table>

Other faculty members:

- Marjorie Collesard
- Ronnie Munro
- Scotty Shaw
- Sandy Stewart

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Appendix 2 Scientific Conference Literature

SPEEAD
Sporting Prosthetics for Everyday & Elite Athletes with a Disability

A Sports Taster Event to Promote Physical Activity and Sports Participation in Those Who Use Prostheses.

SPEEAD
Sporting Prosthetics Master Class 2009

PROGRAMME

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Facilitator</th>
</tr>
</thead>
<tbody>
<tr>
<td>09.30</td>
<td>Registration and Refreshments</td>
<td></td>
</tr>
<tr>
<td>10.00</td>
<td>Welcome and Introductions</td>
<td>Sarah Daane</td>
</tr>
<tr>
<td></td>
<td>Overview of activity stations</td>
<td>Faculty</td>
</tr>
<tr>
<td>10.30</td>
<td>Participants Warm-up and refreshments</td>
<td>Amanda Allen</td>
</tr>
</tbody>
</table>
| 11.00 | Activity participation
|       | Badminton                                 |              |
|       | Balance and coordination (incorporating advice on beginners-level running) |  |
|       | Cycling                                    |              |
|       | Football                                   |              |
|       | Health and well being                      |              |
|       | Prosthetic considerations                   |              |
|       | Racing                                     |              |
|       | Strength and conditioning                  |              |
|       | Table tennis                               |              |
|       | Information station:                      |              |
|       | Archery                                    |              |
|       | Bowling                                    |              |
|       | Curling                                    |              |
|       | Scottish Disability Sport                  |              |
|       | Snowsport                                  |              |
|       | Skiing                                     |              |
|       | Volleyball                                 |              |
| 13.30 | Lunch                                      |              |
| 14.15 | Question and answers forum                 | Faculty      |
|       | Facilitated by Sandy Sexton                |              |
| 15.30 | Closing remarks                            | Bevan Shaw   |

Curling

South Lanarkshire Wheelchair Curling Club was formed in 2002 and now has over 30 playing members. We are a mixed side who meet at Lanarkshire Ice Rink on Monday at 10:30pm. We welcome new members of every ability and have coaching programmes to suit each season.” The curling season runs from September to March. We play in club, league, national and international competitions and several of our members have represented their country in recent years.

Our events calendar allows the club to compete throughout the season, and the club is open to anyone interested in playing curling. If you would like to find out more about the events, contact the club at 63th.net/curling/ or visit our website http://www.southlanarkshic.org.uk/curling/.

We will be very pleased to arrange an initial session to let you try curling, or answer any of your questions.
Strengthening and Conditioning

1) Why do we need Strength & Conditioning?
2) Benefits of Strength & Conditioning
3) F.I.T.T (Frequency, Intensity, Time, Type)
4) General Strength and Functional Strength Exercises for Sports
5) Equipment
6) Types of Strength & Conditioning Exercises

Welcome

The SPEAED Group and The Murray Foundation warmly welcome you to this Sporting Prosthetics Master Class. By attending this event you will have the opportunity to seek expert opinion and advice on a number of sports and activities on the day. This is a chance for you to meet people involved in your daily activity and further your involvement in your current level. The master class will contribute to the objectives of SPEAED by building knowledge exchange through the University of Edinburgh.

Launched in December 2008, the innovative SPEAED project aims to build and maintain capacity and research capability in the wider disability sports community. This project brings together research and best practice from academic, national and international prosthetics and orthotics companies and is clearly focused on disability sport. All the work has been made possible through funding from the University of Edinburgh's collaborative research account as well as support from the Canadian and Australian governments.

Finally, the event has been made possible through the Murray Foundation who kindly supported the prestigious sporting facilities of Murray Park. It is a pleasure to collaborate with the Murray Foundation in such a positive way and the Foundation's representatives are on hand to share the experience with you today.

As activity is tuned to the Olympics in London in 2012 and the Commonwealth Games in Glasgow in 2014, SPEAED hopes people attending tomorrow will allow for a stronger link between sport, health and education in the user and professional communities. We hope you will continue to part of this.

I hope you have an interesting and informative day.

Sarah Greaves, SPEAED Project Manager

Badminton

Badminton is the world's fastest racket sport and it is an excellent aerobic and competitive sport for a prosthetic user. Whether playing socially as a two-a-side game or against friends, or competing nationally, internationally, it offers good exercise and fitness.

A relatively modest prosthetic can be used to take up the sport with perhaps a more sporting device would be appropriate when it is needed for training.

To get started, it is not necessary to play with others who use prostheses. Contact your local sports centres/volunteers to enquire about joining them.

In terms of competition, England, Ireland, Scotland and Wales each have their own governing body that organizes national and international events.

Players are classified based on their mobility and their ability. There are standing and wheelchair classes, although the majority of users play in the former.

Upper and lower limb categories

For more information please visit the following websites:
www.para-badminton.org - International Badminton for the Disabled (IDB)
www.badmintonuk.com
www.badmintonwales.com
www.badmintonScotland.net

Practical Tips for Sport and High Activity

Badminton is a popular sport that combines the best elements of fitness, agility, speed and accuracy.

If you are working hard, taking part in a sport, high activity or more leisurely activity, it is essential to take some care to avoid your body becoming sore. Make sure you have adequate suspension. You may need to take some rest to prevent the coat from rubbing or just to give yourself confidence that your leg won't fall off.

If you work, but can still afford to play, you will be surprised how much your body can stretch, even if it has been busy for years. Take plenty of pain killers in your bag to aid recovery. If your stump is sore, it may be best to try and make an adjustment to your prosthesis to take your pressure off. Take a compression sock (sleeve) to put on when you shower and you will need to put your prosthesis back on.

Save your knees and let's do sports for sport. Thinking of the impact your stump will receive on the shock, pitch or track. It needs all the protection it can.

If you get really rusty you need to change the shock, dry one when you need to, that may be better than you have. If you stretch and then return to play, your skin needs to adjust and it will be a bit difficult to do if you are playing. Take some extra precaution if you are going to play at this time. You can use the wearing of a compression sock, but remember it should not be used with just a stump. You can use them from high street chemists. Using extended shock may help you adjust to the shock, but do not take it off, it may just cause more damage so, please use it correctly and ask advice from others.

You may want to try a sports kit. This kit will wrap around your prosthesis and will be very helpful. Apply them so they are not rubbing within the stool and causing pressure.

The more you use your leg, the more comfortable it will be. This helps you to get used to your prosthesis and keep the skin dry.

To wear a sports kit, also available from your physiotherapist, can help with the sport's performance. If your stump or foot appears repeatedly in the same place, then contact your prosthetist. A slight adjustment may make all the difference.

Remember to fall over. Warming up by sitting will help you get through to your performance. If you do feel too tired, remember your performance will fade.

Contact your Disability Services Centre if you have any issues of decisions.

Enjoy your sport.

Penny Brearman
Clinical Physiotherapist Specialist in Amputee and Prosthetic Rehabilitation, June 2005
Table tennis

To find out more about table tennis in your area, please go to one of your national websites:
http://www.tabletennis-scotland.com/
http://www.englandtabletennis.com/
http://www.metalesc.org/
http://www.tablesportinfo.co.uk/

Contact: Terry Millicent, Senior Coach

Cycling

Cycling is not just an option for Paralympians, it's available for everyone. There are many reasons to cycle and walk over 10,000 miles of mapped cycle routes in the UK which every reason to get on your bike. Cycling is a good activity for users of all abilities and no modification is required to your prosthetics or bike and is also a low-cost activity. Many people own or can borrow a bike already.

There are a few reasons to start pushing the pedals. It’s good for you, itregularly improves fitness level equal to that of a person ten years younger. If you’re training, it leads to muscle gain and reduces the risk of heart disease while also reducing the risk of osteoporosis. This is good for your health. Cycling is a cheap and easy way to lose weight. A good bike will last for years if not abused. If it breaks after a ride and a spare can be affordably replaced. This with the rising cost of fuel cycling is also a low-cost and effective mode of transport.

There are a number of good websites to help you on your cycle ride with such as www.nationalcycles.org.uk. This website also has a search feature to help you find bike tracks near you. www.cyclinguk.org.uk is the website for learning cycling websites. In the UK, it has details of British cycling club development programme called Clubmark, aimed at encouraging clubs to help young people. www.sportscotland.gov.uk is the website of your local cycling clubs. Finally, www.biketart.net is a super resource for all your cycling needs.

Enjoy your cycling!

Contact: Slica Smith, www.biketart.net
http://www.cyclinguk.org.uk/cyclingclubdevelopmentprogrammeclubmark

Football

Expertise is provided today by Raymond Hart of the West of Scotland Football Club for the Physically Disabled. Please see http://www.westofscotlandfco.uk/.

Another option for playing in the South is The Manchester United Foundation which aims to inspire potential sports fans. The club certainly comes into play with our Disability Football Program. JMD United, Our United County, Our Unity County program aims to provide opportunities for anybody to play football. The club run 5 5+ and 5+ disability team and one impairments specific team for JMD United. We have also began new projects to provide opportunities for blind players and children with impairments who ensure our training is truly Football for all.

Our Impulse team is in partnership with Manchester Impulse Football club which was set up by Dave Tindall in 2000. We provide regular coaching sessions and entry into local and disability leagues. Manchester Impulse football club is one of the most successful Impulse specific clubs in England with 12 current and former England Internationals.

We are now working with another clubs The England Impulse Football Association (EIFA) to develop an Impulse league. This will allow opportunities that are not available to regular football and Impulse football can expand it's potential.

At international level Impulse Football is played by teams around the world without restrictions for players or arm amputees for goalkeepers. However, we, along with EIFA, encourage any player who wants to play. The EIFA national league will be open to players who use prosthetics and those who play on amputees, along with arm amputees and those who wish to play football. We aim to take away the barriers and allow people to play football.

For further information contact: adam@impressionfootball.co.uk or visit the EIFA website www.theEIFA.co.uk

Swimming

Swimming is open to men and women in all disability groups including physical, visual, intellectual and hearing impairment, and is practised in more than 120 countries. At the Paralympic Games the athlete classifications are S1 to S8, S9 to S11 stands for swimmers with a Physical Impairment. S1 to S8 are swimmers with the most severe impairments e.g. those with severe cerebral palsy, those with a visual impairment or those with severe brain damage and/or physical handicaps and minimal use of their limbs. By contrast S9 to S11 who are swimmers with a minor limb loss of all sorts. S11 to S13 stands for those with a visual impairment. S11 being swimmers with no legs. S12 being swimmers who can recognize the shape of a hand and have some ability to see. S12 swimmers who are the most sighted but are likely confined to be blind. Swimming rules allow them to use established swimming. Depending on the impairment, some swimmers may start with a float in the water. Visually impaired swimmers may have swimmers who guide them from the end of the pool to the wall as they are approximating the turn or finish of the race.

The Paralympic programme encompasses all strokes and distances up to 400m including relays and individual medley events.

The Great Britain (GB) swimming team are current World Champions and have been the most prolific nation in terms of Paralympic medals among the last 5 Paralympic Games.

To find out more please contact: England disabled Swimming@ www.disabled-sports.co.uk

Download a Swimmer ID Tracker Form at www.brilswimming.org to receive a free IDG and further information on how to get involved in disability swimming or visit the British Disability Swimming official.
Health and Wellbeing

Have you ever had a sports massage, or considered having one?

Allow us to give you some information about sports massage.

Firstly, “What is it?” Sports massage uses basic and advanced hand-on techniques tailored by the practitioner to the specific needs of the client. The treatment can take place before, during or after an event, as part of a training programme, or to enhance recovery from injury or aid recovery from stress. The techniques used can work on superficial or deep tissues and help with the deep tissue work that can cause some discomfort. Sports massage therapists do not work to intentionally cause discomfort and deep tissue work will only be carried out after the area has been sufficiently prepared. It is common for one or two areas to be worked on in any one session e.g. legs and feet.

What are the practitioners? A good question! Many therapists can state that they perform sports massage. It is important that potential clients check the training and qualifications of therapists (preferably before allowing them to work with you). It is recommended that therapists are fully qualified and members of the Sports Massage Association (www.sma.org.uk) and that the website of the appointed therapist is registered with the Federation of Massage (www.massage.org.uk). In this way you can guarantee the therapist has completed an appropriate accredited course covering in depth anatomy, physiology and pathology of common sports injury or muscle issues and the correct techniques for every situation. Membership of these organisations also requires the therapist is keeping up to date with current practice. In many cases these are new massage specialities that are continually being developed and the therapist must be kept up to date with the latest developments in their area of interest. It is advisable to check the qualification of a therapist before booking and researching the relevant qualification or training course.

What can Sports Massage do for me? Well that depends on what your requirements are. Sports massage is used to maintain your character and to prevent and treat soft tissue injury. It can help relieve the muscle tension that can cause injury or help with the recovery process after the injury has been treated. The aim is to prevent and treat soft tissue injury. It can help to relieve muscle tension that can cause injury or help with the recovery process after the injury has been treated. The aim is to prevent further injury and to speed the recovery process. Sports massage can help to improve the psychological state of clients by stimulating treatments prior to events or missing treatments following events.

In a skill setting sports massage can include the following:

- Good healing after an injury or improve a debilitating condition.
- Help increase flexibility and range of movement of joints and help prevent muscle strain.
- Can reduce potential injury areas and treat to prevent an injury from developing.
- Sports massage can help boost the psychological state of clients by stimulating treatments prior to events or missing treatments following events.

Disability Snowsports

About Disability Snowsport UK

DSUK is a sports蒹entred organisation with a unique purpose of ensuring that anyone regardless of their disability can take part and enjoy the thrill of snowsports.

For nearly 30 years we have applied exceptional knowledge and adaptability to enable those with a disability to experience the joy of skiing alongside the whole family.

We provide existing and life enhancing activities for individuals and groups who require adaptive equipment and/or special instruction and support.

Our work is acknowledged and applauded throughout the world because of our:

Knowledge

- Highly qualified and experienced instructors staff.
- Active links with the latest developments in adaptive skiing and equipment.
- We have been providing skiing since 1976.
- We have a unique heritage and philosophy.

Results

- Greater self-confidence, improved co-ordination, increased independence.
- Improved social skills, better decision making and improved self-esteem are just some of the benefits gained.
- People achieving their potential.

We provide:

- Overseas activity weeks, adaptive snowsport school in Scotland, local groups.
- Adaptive equipment and or group courses.
- Training for instructors, volunteers and ski centre staff.
- Advice and encouragement.

With permission, Disability Snowsport
Rowing

Please see additional information leaflet provided on Adaptive Rowing. You can also contact Jodie Glasser on jodie.glasser@adesa.com for further information.

Running

The Biomechanics of Amputee Running

By Rachel Bailey, PhD, PT

Contact provided by The OPGXORX - http://www.sport.com/edge/

The biomechanics of amputee running is an interesting area that is useful in clinical application. Various prosthetic developments such as BeckSport and CuffDesigns provide improved stability at all levels of amputee skill levels, and their use in recreational or sport environments is on the rise.

The article will examine the fundamentals of amputee running, focusing on the principles discussed above and how they apply to running in general and speed-related movements such as basketball or tennis.

The running cycle is divided into stance and swing phases. During stance phase, the period from initial contact to toe-off, is referred to as the "Absorption phase," where forces decrease as the runner contacts the ground. From toe-off to foot flat in the "Impaction phase," where the body transfers the acceleratory forces that are carried over as the limb enters the swing phase. From toe-off to terminal swing, the limb begins to decelerate as it returns to the absorption phase.

The beginning and end of each swing phase has an apex of double flex, where neither limb is in contact with the ground. As a result, the acetabular plane and the TDO joints serve as the running gait cycle. As speed increases, the percentage of stance phase decreases.

Absorption Phase

Ttaizing absorption phase

The initial contact of the acetabular plane is referred to as the absorption period. In this period, the lower limb acts as an shock absorber for the body, reducing the considerable ground reaction forces passing through the limb, which can be two or three times greater than body weight.

As the foot strikes the ground, a backwind force is generated by the spring connection of the hip extensor muscles, while the hip adductors provide the necessary pelvic stability. Muscles stabilization coupled with motion ensures a biomechanical cycle that reduces the effects of the ground reaction forces.
Information Station

Scottish Disability Sport - Sporting Pathway

Scottish Disability Sport (SDS) is the national governing body for disability sport in Scotland. SDS has the responsibility to develop and support the sporting activity for athletes with physical, sensory and learning disabilities.

Local Programming:
Local disability sport officers are employed through a number of Local Authorities to develop local disability sport opportunities. There are 10 local branches in membership of SDS which provide areas with access to the SDS competition structure and additional funding support. A full list of local contacts is included.

National Events Programme:
Scottish Disability Sport runs a comprehensive annual calendar of events across a wide range of sports including athletics, basketball, bowling, football, swimming, and a full list of events can be found on the SDS website at www.sportsabilityscotland.com.

Key Sports:
SDS has a number of key sports for which annual Performance Plans are developed and funded through sportscotland. These focus on the development of performance athletes and how SDS can support the athletes and the sport effectively through high performance events, squad training, coaching and development and junior events. The key sports are listed below:

- Athletics
- Basketball
- Bowls
- Football
- Swimming
- Volleyball

National Squad:
SDS has two national squads in the sports of Athletics, Basketball, Bowls, Football, Swimming, and Volleyball. For an example of these sports there are also Development Squads and Junior Squads.

Athletics Academy:
Established in 2002, the Academy aims to ensure the continued development of our most promising athletes and to support them into performance sport. The Academy operates on a regular and international competitions.

National Squad:
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The Academy operates on a regular and international competitions.

Summer Camp:
Scottish Disability Sport in partnership with Disability Sport Scotland and sportscotland, is delighted to be running the 30th Annual Summer Sports Camp for young people with physical disabilities and deafblindness. The details of the Summer Camp are as follows:

- Dates: 29th June - 2nd July 2008
- Location: Various venues across Scotland
- Cost: £125

TTS running acceleration phase
As the foot reaches the maximum extension, all movements are passive during terminal stance for hip flexion which is followed by a rapid extension of the hip and knee. The peak plantarflexion is due to the result of the rapid movement of the tibia over the foot, creating a high lever in the foot to release the elastic energy. During running, the elastic energy stored in the tendons and ligaments, and the Achilles tendon in the foot, is released to act as a spring, storing and releasing energy for subsequent steps.

The "tendons" energy stored in the ankle joint has been referred to as "the elastic energy", and has been found to be a major factor in the energy generation of the running cycle. The energy stored in the plantarflexor muscles is an important factor in the energy generation during the running cycle. The elastic energy stored in the plantarflexor muscles is an important factor in the energy generation during the running cycle.

At terminal stance, the horizontal aponeurosis of the internal muscles work on the plantarflexors to maintain the foot on the ground. The energy generated by the plantarflexor muscles during the running cycle is stored in the tendons and ligaments, and the Achilles tendon in the foot, and is released to act as a spring, storing and releasing energy for subsequent steps.

The hip flexion is generated by a powerful contraction of the hip flexors. Stability and line of progression of the foot are maintained by stabilizing connections of the hip adductors and abductors. The hip adductor and abductor muscles to stabilize the pelvis and the final contact to support weight.

Deceleration phase
TTS running deceleration phase
As the hip comes forward, the muscles are prepared to accelerate the body forward, while also allowing the foot to make contact with the ground. The adductor and abductor muscles to stabilize the pelvis and the final contact to support weight.

Transitional or "peak flexion" and extension velocities, as well as maximal hip and knee flexion angles, are determined by the foot during running and are an essential consideration. sock placement and suspension requirements have been identified as critical factors for the reduction in ankle joint kinematics, which may limit hip flexion. Creating a realistic model that provides the same condition as closely as possible to the real condition has been a significant task.

Front of the foot:
- Step on the foot with your heel, and push your foot off the ground as you take your first step.
- Use your foot to lift your body and push your hips forward.
- Use your leg to push your body forward.

Back of the foot:
- Step on the foot with your heel, and push your foot off the ground as you take your first step.
- Use your foot to lift your body and push your hips forward.
- Use your leg to push your body forward.

Knee:
- Keep your knee bent, and push your foot off the ground as you take your first step.
- Use your leg to push your body forward.
- Use your leg to push your body forward.

Quadriceps:
- Step on the foot with your heel, and push your foot off the ground as you take your first step.
- Use your foot to lift your body and push your hips forward.
- Use your leg to push your body forward.

Hamstrings:
- Step on the foot with your heel, and push your foot off the ground as you take your first step.
- Use your foot to lift your body and push your hips forward.
- Use your leg to push your body forward.

Leg:
- Step on the foot with your heel, and push your foot off the ground as you take your first step.
- Use your foot to lift your body and push your hips forward.
- Use your leg to push your body forward.

Hip:
- Step on the foot with your heel, and push your foot off the ground as you take your first step.
- Use your foot to lift your body and push your hips forward.
- Use your leg to push your body forward.

Ankle:
- Step on the foot with your heel, and push your foot off the ground as you take your first step.
- Use your foot to lift your body and push your hips forward.
- Use your leg to push your body forward.

Calf:
- Step on the foot with your heel, and push your foot off the ground as you take your first step.
- Use your foot to lift your body and push your hips forward.
- Use your leg to push your body forward.

Leg pressure:
- Step on the foot with your heel, and push your foot off the ground as you take your first step.
- Use your foot to lift your body and push your hips forward.
- Use your leg to push your body forward.

Foot:
- Step on the foot with your heel, and push your foot off the ground as you take your first step.
- Use your foot to lift your body and push your hips forward.
- Use your leg to push your body forward.

Leg length:
- Step on the foot with your heel, and push your foot off the ground as you take your first step.
- Use your foot to lift your body and push your hips forward.
- Use your leg to push your body forward.

Foot placement:
- Step on the foot with your heel, and push your foot off the ground as you take your first step.
- Use your foot to lift your body and push your hips forward.
- Use your leg to push your body forward.

Leg swing:
- Step on the foot with your heel, and push your foot off the ground as you take your first step.
- Use your foot to lift your body and push your hips forward.
- Use your leg to push your body forward.

Foot contact:
- Step on the foot with your heel, and push your foot off the ground as you take your first step.
- Use your foot to lift your body and push your hips forward.
- Use your leg to push your body forward.
Warm-up, Stretching and Cool-down

If someone who was sedentary mentioned that they were running a marathon in a few days time, most people would think they were insane and setting themselves up for serious injury.

Every time you exercise your body needs time to adapt to exercise, your cardiovascular and musculoskeletal systems need to build the stamina, flexibility and resilience required for your chosen activity. You also need to prepare and adjust psychologically and nutritionally too. You will perform better and reduce the risk of injury if you warm up your muscles beforehand. You will also recover faster if you cool down at the end of exercise and this is where stretching has a role.

There has been a lot of discussion regarding the pros and cons of stretching over the past few years. Most of the experts agree that stretching is important in controlling the contribution stretching can make to performance and reducing your injury risk. It is also apparent that appropriate sports specific stretches need to be used and so it is important that any stretching movement is performed correctly and at an appropriate time.

There are two main types of stretches:

DYNAMIC
Involves controlled movement of body parts with gradually increasing speed of movements or movements or both then together for example arm swings, neck circles. These improve dynamic flexibly and power. Dynamic stretching targeting the joints and muscles mainly involved in the activity you are about to participate in will help prepare your body and can improve performance.

SIMPLE (also called isometric stretching)
These isolated muscle actions involve the targeted muscle groups being lengthened through the pulling or “hard tension” and then held without resistance against an immense force for example a wall. Generally, static stretching should not be performed in the warm-up phase as it does not help increase muscle power and can be detrimental to performance. Static stretching is most useful in the cool-down phase.

The TSL will also contract the muscles of the lower limb in an identical pattern to the non-amputee during terminal swing. The knee should be slightly flexed and as stated earlier these will be a reduction in forces as the limb prepares to strike the ground.

The most likely to land on the associated with the prosthetic limb. Initiating a backward force prior to contact will not only exacerbate the body forward, but will simultaneously ensure that the knee will make a significant motion. Many transfemoral amputees also adopt an extended stance posture as they descend to the ground, although this is unnecessary.

TRUNK AND LEG MOVEMENTS

For the amputee, arm swing is particularly important, yet often difficult to maintain and concentrated efforts must be made to maintain a symmetrical arm swing, especially if speed increases when the legs have a tendency to lose symmetry of movement.

Transfemoral amputees have a tendency to demonstrate increased deflections of the prosthetic limb, especially in the prosthetic lower limb at a more profound degree. The ankle position of both the leg and the arm should oppose forces that lead to muscle forward momentum and increase the metabolic requirement. Metal-based, flexible socket stability will also require additional effort of the prosthetic limb and facilitate unaided trunk movement.

This overview of the biomechanics of amputee running should help in socket fabrication and component selection as well as planning an appropriate training program. Amputees will be better able to optimize their performance in order to achieve their athletic goals.

University of Miami School of Medicine, Department of Orthopedics: Division of Physical Therapy

References


STATIC STRETCHING EXERCISES


The following are examples of general static stretching exercises that should form part of the cool down program at the end of a training session when stretches are held for 10 seconds or more to improve the mobility and range of movement when stenches are held for 30 seconds. In all exercises breathe easily while performing each.

Chest Stretch
- Stand tall, feet slightly wider than shoulder-width apart, knees slightly bent.
- Hold your arms out to the sides parallel to the ground and the palms of the hands facing forward.
- Stretch the arms back as far as possible.
- You should feel the stretch across your chest.

Bicep Stretch
- Stand tall, feet slightly wider than shoulder-width apart, knees slightly bent.
- Hold your arms out to the sides parallel to the ground and the palms of the hands facing forward.
- Raise your right hand towards your right ear.
- Stretch the arms back as far as possible.
- You should feel the stretch across your chest and in the biceps.

Upper Back Stretch
- Stand tall, feet slightly wider than shoulder-width apart, knees slightly bent.
- Place your right hand on your left hip.
- Place your left hand on your right hip.
- Breathe in and then stretch your left arm up and over your head.
- Place your left arm down and out to the side.
- You should feel the stretch between your shoulder blades.

Shoulder Stretch
- Stand tall, feet slightly wider than shoulder-width apart, knees slightly bent.
- Place your right hand on your left shoulder.
- Place your left hand on your right shoulder.
- Breathe in and then stretch your right arm up and over your head.
- Place your right arm down and out to the side.
- You should feel the stretch in your shoulder.

Neck Mobility
- Reclined Neck - Sit up in a straight back chair with your head in a neutral position.
- Keep your head in a relaxed position and rotate your head gently to the left, then to the right.
- Repeat 5 times per side.

Shoulder Circles
- Stand tall, feet slightly wider than shoulder-width apart, knees slightly bent.
- Place your right hand on your left shoulder.
- Place your left hand on your right shoulder.
- Breathe in and then rotate your shoulders gently.
- Repeat 5 times per side.

Arm Swings
- Stand tall, feet slightly wider than shoulder-width apart, knees slightly bent.
- Keep your arms relaxed at your sides.
- Keep your arms relaxed at your sides.
- Breathe in and then swing your arms forward and back.
- Repeat 5 times per side.

Side Bends
- Stand tall, feet slightly wider than shoulder-width apart, knees slightly bent.
- Keep your arms relaxed at your sides.
- Breathe in and then bend your body to your right as much as possible.
- Reach for your right foot with your right hand.
- Repeat 5 times per side.

Hip Circles and Twists
- Stand tall, feet slightly wider than shoulder-width apart, knees slightly bent.
- Keep your arms relaxed at your sides.
- Breathe in and then twist your hips to the right as much as possible.
- Reach for your right foot with your left hand.
- Repeat 5 times per side.

Half Squat
- Stand tall, feet slightly wider than shoulder-width apart, knees slightly bent.
- Keep your arms relaxed at your sides.
- Breathe in and then bend your knees.
- Reach for your right foot with your right hand.
- Repeat 5 times per side.

Leg Stands
- Stand tall, feet slightly wider than shoulder-width apart, knees slightly bent.
- Keep your arms relaxed at your sides.
- Breathe in and then kick your right leg backwards.
- Repeat 5 times per side.

It is important to appreciate that a warm-up and cool-down should incorporate more than just stretching. The aim of warming up is to prepare the body for activity by loosening muscles and joints, to remove joint range of movement, contractile and connective tissues of muscles and to increase blood flow to the muscles. This involves the body temperature reaching a similar level as the cool-down.

Appendix 2 SPEEAD Conference Pamphlet

SPEARING PROSTHETICS NATIONAL CONFERENCE 2009

PROFILES: KEYNOTE SPEAKERS

Elrian Bartlett
Elrian Bartlett is from Scotland, UK. He is a prosthetics user who has a background in snow doing and became a sporting prosthetics development and manufacturing manager. He is competing in downhill mountain biking on "The Bartlett Edition", a universal knee system. Elrian says "is possible, everything is possible. The only time he considers giving up is when he has to walk the mountain bike up the mountain."

Professor Helena Burger
Helena Burger is a Professor of Physical and Rehabilitation Medicine and Medical Director of the Institute for Neurorehabilitation, University of St Andrews. She has a special interest in outcome measurement in rehabilitation of people following amputation of upper and lower limbs. Helena is a medical doctor for the German Paralympic team and has been in attendance at four Paralympic games with the national team in Atlanta, Sydney, Athens and Beijing.

Gilmour Stevenson
Gilmour Stevenson is Chair of the UK Strength & Conditioning Association, with over 20 years of working within elite sport, managing and delivering coaching education programmes, University Principal at the Institute of Physical and Rehabilitation Education, Gilmour is now Director of his own company Sportsytelly Ltd, which focuses on high performance sports coaching, coaching education and strength and conditioning. In recent years, Gilmour has had the pleasure of working with clients who have both lower limbs and upper limb prostheses, and is keen on exploring the opportunity to speak with those who are involved in the rehabilitation of prosthetic users.

http://www.strath.ac.uk/prosthetics/research/speedaprosperingprosthesies/

SPEARING PROSTHETICS NATIONAL CONFERENCE 2009

REGISTRATION FORM

Please register me as a SPEEAD conference delegate

Full/Dr/Mr/ Mrs/Miss/Other

Surname First Name

Address

Post Code Business Telephone

Profession Position Held

E-mail Address Home Address

Post Code Mobile Telephone

Please indicate any dietary requirements or additional support needs you may have

Plaice return this form to Linda Gilmour

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Scotland

U.K. (0141) 848 1933

e-mail: mja@einstein.bath.ac.uk

Forms to be returned Friday 10th June, 2000

SPEEAD

Sporting Prosthetics National Conference 2009

PROGRAMME

09:00 - 09:30 Registration and Refreshments

09:30 - 09:45 Welcome Conference Chair: Sarah Dears

09:45 - 10:30 The Opening Address

Professor Jan McDonald

The Principal and Vice-Chancellor, University of Strathclyde

10:30 - 10:45 Psychology of Physical Activity and Sport Participation: Modelling and Barriers

Keynote Speaker: Prof Nanette Mutrie

10:45 - 11:00 Inclusive Coaching and Conditioning: Empowering the champions of the future

Keynote Speaker: Gilmour Stevenson

11:00 - 11:30 Morning Coffee

11:30 - 12:30 Free Paper Session I

A Comparative Study of Adaptive Walking in Prosthetic Limb Users and Amputees in Terms of the Functional Outcomes

Paper 1: Nancie Fisher

Paper 2: Aline Pitts

Paper 3: Carolann Weir

12:30 - 12:00 Sport and Recreation Activities of People with Limb Deficiency: USA perspective

Keynote Speaker: Nanette Mutrie

12:30 - 14:00 Lunch & Exhibitions

Afternoon Session Chair: Sandra Searns

14:00 - 14:45 Interview and Discussion Forum led by

The users of lower limb prostheses discuss their perceptions

Gill Edwards, David Malcolm, Sean McInven and Linda Raul

14:45 - 15:15 Paralympic Athlete: inspirational champions or unrealistic role models?

Keynote Speaker: Prof Helena Burger

15:15 - 15:45 Afternoon Tea and Exhibition

15:45 - 16:15 Free Paper Session II

Sports participation for people with limb deficiency

Paper 1: Jamie Dillane

Paper 2: Gail Smith

16:15 - 16:45 Summary & Closing Remarks

Sandra Searns

16:45 - 18:00 Drinks Reception and Prize giving for Best Poster

Complementary Visit to The Hampden Experience (Scottish Football Museum)

18:00 Close