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
CONTENTS

1. INTRODUCTION

2. SUMMARY of PROPOSAL

3. OUTLINE of ACTIVITY
   3.1 Building Research Capacity
      3.1.1 Development of SPEEAD Network
      3.1.2 Recruitment & registration of postgraduate researchers
   3.2 Addressing Postgraduate Instructional Course Need
   3.3 Knowledge Transfer and Client and Practitioner Engagement
      3.3.1 Delivery of Master Class Skills Training Events
      3.3.2 Delivery of a Scientific Conference

4. IMPACT of ACTIVITY

5. CONCLUSIONS and ONGOING PROJECT ACTIVITY

6. APPENDIX 1 SPEEAD Master Class Educational Pack (Glasgow Example)
   APPENDIX 2 SPEEAD Conference Pamphlet
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 involved¹. 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](http://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 short 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 Scotland\(^1\) and England\(^2\) 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 prostheses 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 3\(^{rd}\) 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
SPEAR Master Classes - Station Facilitators & Contributors
Murray Park Training Ground, Auchenhowie, Mingavie, Glasgow
Saturday 13th June 2009

Jannine Ashton
Tango Health & Fitness

Penny Browneel
SPEAR Swimming Group

Ed Brown
Ducks by Design, UK

Judy Candy
Blue Athlete & Performance

Sue Davidson
Scottish Disability Sport

Sarah Dey
University of Strathclyde

Leanne Dick
Glasgow Boxing Club

Marsha Dodds
The Murray Foundation

Malcolm Doonan
University of Strathclyde

Colin Edwards
SPEAR Swimming Group

Donna Fisher
SPEAR Swimming Group

Jamie Gillooly
SPEAR Swimming Group

Richard Hirst
SPEAR Swimming Group

Raymond Hurst
Wall of Scotland Football Club

for the Physically Disabled

Russell Jones
Glasgow Boxing Club

Terry McKinnon
Drumchapel Table Tennis Club

George McMillan
Spafoods

David Milne
Strathclyde University, Physiotherapy

Aine Murray
University of Strathclyde

South Robertson
International Baseball for the Disabled

Sandy Robertson
University of Strathclyde

Scott Robertson
The Murray Foundation

G.L. Smeath
SPEAR Swimming Group

Sue Smith
SPEAR Swimming Group

Bill Smith
International Baseball for the Disabled

Bob Sneyd
Bonnie Charities & Sports Management

Gordon Wilson
SPEAR Swimming Group

Roy Wilson
Scottish Swimming

Richard Yule
Archery

Acknowledgements:
We wish to extend our sincere thanks to the following organisations:

Murray Park Training Ground
Auchenhowie, Mingavie, Glasgow

SPEAR Master Classes - Faculty

Activity
Balance and Coordination (incorporating
sitting balance and self-moving)

Duncan Robertson

SPEAR Swimming Group

Ploeg
James Gillooly, Linda Dill, Russell Jones

Handball
Raymond Hurst

Vice-President, Standard Handball Club

for the Physically Disabled

Cycling
Judy Candy & Sue Smith

Table Tennis
Terry Mc Kinon

Drumchapel Table Tennis Club

Prosthetics
Deborah Fitchen, Richard Johnes,
Gordon Wilson

Strength & Conditioning
Mark Dobbie & Sarah Dobbie

Health & Wellbeing
Dr Jacqueline Sharp, Annie Allen,
Rob Strachan, George McMillan

Information Station

Ed Brown
Disability Sports UK

Roger Davidson
Scottish Disability Sport

David Morgan
Glasgow Lamontshore

Curing Club

Swimming Etc.

Richard Wills
Archery

Roy Wilson
Glasgow Swimming

Other faculty members:

Marjorie Coles

Wren Murray

Sue Cope

Gordie Saxon

Published June 2009
© 2009 National Centre for Prosthetics and Orthotics
University of Strathclyde
Photography: Joyce Hart (unless otherwise stated)
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>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>09.30</td>
<td>Registration and Refreshments</td>
</tr>
<tr>
<td>10.00</td>
<td>Welcome and Introductions, Overview of activity and information stations</td>
</tr>
<tr>
<td>10.30</td>
<td>Participants Warm-up and refreshments</td>
</tr>
<tr>
<td>11.00</td>
<td>Activity participation:</td>
</tr>
<tr>
<td></td>
<td>Badminton</td>
</tr>
<tr>
<td></td>
<td>Balance and coordination (incorporating advice on beginners-level running)</td>
</tr>
<tr>
<td></td>
<td>Cycling</td>
</tr>
<tr>
<td></td>
<td>Football</td>
</tr>
<tr>
<td></td>
<td>Health and well being</td>
</tr>
<tr>
<td></td>
<td>Prosthetic considerations</td>
</tr>
<tr>
<td></td>
<td>Rowing</td>
</tr>
<tr>
<td></td>
<td>Strength and conditioning</td>
</tr>
<tr>
<td></td>
<td>Table tennis</td>
</tr>
<tr>
<td></td>
<td>Information station:</td>
</tr>
<tr>
<td></td>
<td>Archery</td>
</tr>
<tr>
<td></td>
<td>Bowling</td>
</tr>
<tr>
<td></td>
<td>Curling</td>
</tr>
<tr>
<td></td>
<td>Scottish Disability Sport</td>
</tr>
<tr>
<td></td>
<td>Snowsport</td>
</tr>
<tr>
<td></td>
<td>Swimming</td>
</tr>
<tr>
<td></td>
<td>Volleyball</td>
</tr>
<tr>
<td>13.30</td>
<td>Lunch</td>
</tr>
<tr>
<td>14.15</td>
<td>Question and answers forum</td>
</tr>
<tr>
<td>15.30</td>
<td>Closing remarks</td>
</tr>
</tbody>
</table>

Curling

South Lanarkshire Wheelchair Curling Club was formed in 2003 and now has over 30 playing members. We are a mixed club who meet at Lanarkshire Ice Rink, Monday at 13:00pm. We welcome new members of every ability and have curling programmes to suit all. Each season runs approximately two hours. 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 winter calendar shows the club's competition schedule but many of our members simply want to take part in a recreational game of curling and enjoy the social aspects of the curling arena.

The gallery has a display of curling related photographs from throughout the season.

If you would like to find out more about curling with South Lanarkshire Wheelchair Curling Club, contact us through our website http://www.laithem.org.

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

Source: David Morgan and partners with assistance.
Strength and Conditioning

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

Welcome

The SPEEAD Grpping and The Murray Foundation warmly welcome you to the Sporting Prosthetics Masterclass 2009.

SPEEAD has been a driving force behind sports for people with disabilities for many years. This event will contribute to the objectives of SPEEAD by building on knowledge and expertise from those who advise and support sporting events. This will enable the participants to gain a better understanding of the best practices in place in the sporting world.

Launched in October 2009, the innovative SPEEAD project aims to build the level and nature of research and development in the world’s level sports community. The project has been designed in close cooperation with experts in the field of sports and has been funded through the University of Oxford with the help of experienced coaches. It is therefore a privilege to have such a great support and we are encouraged to thank them in your own sporting community.

Finally, the event has been made possible through the efforts of the London 2012 and Commonwealth Games in Glasgow 2014. SPEEAD hopes that obvious evidence will allow for a stronger link between sport, health and education in the user and professional communities.

Thank you for being here and for the support that was given to us.

Ballarat Dwell, SPEEAD Project Manager

Badminton

Badminton is a fast-paced team sport and it is an excellent aerobic and competitive sport for a prosthetic user. Whether playing socially, as a team-sports centre with friends, or competing nationally/ internationally, it offers good exercise and fitness.

A relatively modest prosthesis can be used to take up the sport, with perhaps a more expensive device being appropriate if the limitations are minimal.

To get started, it is not necessary to play with other people who use prostheses. Contact your local sports centre, clubs or teams about joining them.

In terms of competition, England, Ireland, Scotland and Wales each have their own governing body, which encourages development in the sport. Some regions have a number of other organisations that organise local events on a regular basis.

Practical Tips for Sport and High Activity

If you are working hard and not taking part in sport, high activities or more leisurely activity it is essential to take some time to rest and avoid your sport becoming your life. Make sure you have adequate sleep and rest.

You may need to exercise to prevent the impact of sport on your body. This can be achieved by taking part in physical activities that you enjoy and that are safe for you.

Save your knees and avoid overuse.

If you regularly exercise, your knees and other joints can be strengthened and you can avoid injury.

Practice proper technique.

When you are exercising, your legs should be in the correct position for the activity you are doing. You can practice this by looking in the mirror or by taking pictures of yourself. You can then use these pictures to remind yourself of the correct position.

Stay active.

Regular exercise is important for maintaining your health and fitness. It can help to improve your mood, energy levels and overall well-being.

Enjoy your sport!

Penny Broadhead
Clinical Physiotherapist, Specialist in Amputees & Prosthetic Rehabilitation, June 2009

Page 9 CTA SPEEAD Final Report
Table tennis

To find out more about table tennis in your area, please go to one of your national websites:

http://www.tennisescotland.com/
http://www.tennisengland.co.uk
http://www.michaellawrence.com
http://www.thetennisclubnetwork.com

Contact Terry Mclennan, 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 15000 miles of mapped cycle routes in the UK there’s every reason to get on your bike. Cycling is a good activity for users at all levels and no modification is required to your prostheses or bike and it is also a low cost activity – many people own their own bike outright.

There are a few reasons to start pushing the pedals and if you’re looking for a regular activity that’s fun, fitness and a way to give something back to society, then cycling is your answer! There’s no need to get a specific bike, as long as it’s comfortable and can be adapted to fit your needs.

There is a number of good websites to keep you up to date with such an website is www.cyclinguk.org.uk. This website also has a search feature to enable you to find cycle tracks near you. Popsocycling.org.uk is the website to search cycling venues in the UK - it has details of British cycling club development programmes called BikeRide, designed to encourage clubs to help young people join cycling in a safe, structured environment. Details can be found on this website about local cycling clubs. Finally www.birmingham.net is a super resource for all year cycling needs.

Enjoy your cycling!

Contact Colin Smith, main@birmingham.net

Football

Expertise is provided today by Raymond Hart, the Wales of Scotland Football Club for the Physically Disabled. Please see http://www.western-sock.com/tap/ for previous editions.

Another option for playing is theGaith in The Manchester United Foundation which aims to inspire potential future stars. The Gaith is a great way to get involved in Fantasy Football. It’s also a fun way to play with friends and even more fun if you’re a Manchester United fan.

Our expertise comes from the inspirational story of the Gaith, but the teamwork and support that is so vital to the success of the Gaith, is what makes this a fantastic club for all fans of Manchester United.

The Manchester United Foundation is the most successful and competitive club in England with 17 current or former England Internationals.

We are now working with another club, the England Amputee Football Association (EAPA) to develop amputee leagues. This will allow opportunities continue and amputee football can continue its growth.

At an international level Amputee Football is played by single leg amputees on an artificial pitch without prostheses for outfield players and arm amputees for goalkeepers. However, we, along with the EAPA, encourage any player who wishes to play. The EAPA national league is open to players who use prostheses and those who play on artificial pitches and within arm amputees and the sight of blind football should be enjoyed by all.

For further information contact: adam@eapao.org or visit the EAPA website www.eapao.org.uk

Swimming

Swimming is open to men and women in all disability groups including physical, visual, mental and physical conditions and is practised in many of the countries.

At the Paralympic Games the classification system is SI & SU which stands for swimmers with a Physical Impairment. SU are swimmers with the most severe impairments e.g. those with very severe coordination problems in their hands or those with very limited use of their hands and arms, in tears. Those who have a mental impairment e.g. those with a mild or moderate brain injury and those with a mild or moderate intellectual disability. SU are swimmers who can recognize the shape of a hand and have some ability to see. SU swimmers are the most sighted but are likely to be blind. Swimmers rules apply for those with a visual impairment. SI being swimmers without visible impairment. SI2 being swimmers with no visible impairment. SI22 being swimmers who are unable to see. SI32 being swimmers who are able to see.

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

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

To find out more please contact: England duathlon@swimming.org
Scotland and Northern Ireland: swimming.org
Wales: hwsw@wales.wales.org.uk

Download a Swimmer ID Tracker Form at: www.britishswimming.org to receive a free OVO and further information on how to get involved in disability swimming or visit the British Disability Swimming stand.
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 hands-on techniques tailored by the practitioner to the specific needs of the athlete. The treatment can take place before, during or after an event, as part of a training programme, to enhance recovery from injury or aid recovery from strain. The techniques used can work on superficial or deep tissues and it is 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 warmed up; it is common for one or two areas to be worked on in any one session, e.g. leg and knee.

Why are the practitioners called "inveterate"? 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 best include Sports Massage (www.sma.org.uk/members) and that you can guarantee the therapist has completed an appropriately accredited course covering in-depth anatomy, physiology and pathology of common sports or work injuries and the current techniques for every situation. Membership of these organisations also ensures your therapist is keeping up to date with current practice and maintaining high standards by completing a number of continuing professional development hours each year. However, unless the therapist has a medical qualification they cannot diagnose specific medical conditions and you may therefore be referred to an appropriate professional should your therapist feel this is necessary.

What can Sports Massage do for me? - Well that depends on what your requirements are. Be sure to communicate your expectations and any question you have to help them to give you work that is appropriate and what techniques will be best for you. At events this may be a very brief discussion to ensure there are no injuries or contraindications to massage.

In a skill setting, sports massage can include the following:

- Gliding/feathering after injury or improve a debilitating condition
- Help improve flexibility and range of movement of joints and helping prevent delayed onset muscle soreness (DOMS)
- Enhance blood flow, and treat them to prevent an injury from developing.
- Sports massage can also help boost the psychological state of clients by stimulating treatments prior to events or reducing treatments following events.

Disability Snowsports

About Disability Snowsport UK

DSU is a not-for-profit organisation with a unique purpose of ensuring that anyone regardless of their disability can take part in and enjoy the thrill of snowsports.

For nearly 20 years we have applied exceptional enthusiasm and adaptability to enable those with a disability to experience the joy of skiing alongside the able-bodied.

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

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

Knowledge

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

After effects

- Greater self-confidence, improved co-operation, improved independence, improved social skills, better ability to manage and improved self-esteem are just some of the benefits gained.
- People achieving their potential.

We provide:

- Overseas activity weekends, adaptive snowsport school in Scotland, local groups, outreach programmes, support for the British Disability Ski Team
- Training for instructors, volunteers and ski centre staff
- Advice and encouragement.

With permission, Caistubh Nepal
Rowing

Please see additional information leaflet provided on Adaptive Rowing.
You can also contact Jamie Leslie on jamie@adaptiverow.co.uk for further information.

<table>
<thead>
<tr>
<th>Club</th>
<th>Name</th>
<th>Address</th>
<th>Telephone</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perth Valley Disability Sports</td>
<td>Graham Harvey</td>
<td>Perth Valley Disability Sport, Sighthill Community Stadium, 2nd Floor, G31 2LA, Scotland</td>
<td>0141 277 6308</td>
<td><a href="mailto:graham.harvey@nhs.net">graham.harvey@nhs.net</a></td>
</tr>
<tr>
<td>Glasgow</td>
<td>Gordon McCormick</td>
<td>Glasgow Disability Sport, 3 Martin Street, Glasgow, G1 1LH</td>
<td>0141 237 6304</td>
<td><a href="mailto:gordon.mccormick@nhs.net">gordon.mccormick@nhs.net</a></td>
</tr>
<tr>
<td>Highland Disability Sport</td>
<td>Charlie Forbes</td>
<td>Highland Disability Sport, Ruthven House, Culloden, Inverness, IV3 8JS</td>
<td>01463 230 230</td>
<td><a href="mailto:charlie.forbes@nhs.net">charlie.forbes@nhs.net</a></td>
</tr>
<tr>
<td>Lothian Disability Sport</td>
<td>Gary Preston</td>
<td>Lothian Disability Sport, Midlothian Sports Centre, Prestonfield, EH8 9QQ</td>
<td>0131 222 5505</td>
<td><a href="mailto:gary.preston@nhs.net">gary.preston@nhs.net</a></td>
</tr>
<tr>
<td>North Ayrshire S.A.D.</td>
<td>Stephen Garrow</td>
<td>North Ayrshire S.A.D., 8 Magna Leisure Centre, Harbour Road, Irvine, PA4 5PS</td>
<td>01292 317 337</td>
<td><a href="mailto:stephen.garrow@nhs.net">stephen.garrow@nhs.net</a></td>
</tr>
<tr>
<td>Perth &amp; Kinross Disability Sport</td>
<td>Gordon Ness</td>
<td>Perth &amp; Kinross Disability Sport, Balhousie Primary School – Room 18, Dorset Road, Perth, PH2 9AN</td>
<td>01738 417 129</td>
<td><a href="mailto:gordon.ness@nhs.net">gordon.ness@nhs.net</a></td>
</tr>
<tr>
<td>South Ayrshire Sports Access to Sport</td>
<td>Colin Quirey</td>
<td>South Ayrshire Sports Access to Sport, Precinct Centre, South Ayrshire, KA7 4BP</td>
<td>01292 317 337</td>
<td><a href="mailto:colin.quirey@nhs.net">colin.quirey@nhs.net</a></td>
</tr>
<tr>
<td>South Lanarkshire Disability Sports</td>
<td>Mike Wilson</td>
<td>South Lanarkshire Disability Sports, Craigston House, 29 Craigston Road, Hamilton, ML3 8DN</td>
<td>01698 401 112</td>
<td><a href="mailto:mike.wilson@nhs.net">mike.wilson@nhs.net</a></td>
</tr>
</tbody>
</table>

---

Running

The Biomechanics of Amputee Running

By Robert Daly, PhD, PT

The biomechanics of amputee running is an interesting area that is useful in clinical application. With prosthetic developments such as HexSprint and Cylindre designs permitting improved levels of athletic ability, it is impossible to ignore the potential of this sport for amputees. The study of running mechanics and physical therapy must maintain a certain level of knowledge in this area.

Understanding these factors during running will assist greatly with prosthetic rehabilitation, injury prevention, and the design of appropriate training programs that will assist the amputee in attaining his athletic goals.

This article will examine the fundamentals of running mechanics, the principles discussed apply most sports requiring running in general, and speed-related movements such as basketball and soccer.

The running cycle is divided into stance and swing phase. During stance phase, the period from initial contact to mid-stance is referred to as the "propulsion phase," whereas forces dissipate as the runner contacts the ground. From mid-stance to mid-swing, the "suspension phase," where the body's gravitational forces are not counteracted by the leg, and the swing phase from mid-swing to initial swing, the force returns to the ground as it returns to the absorption phase.

The beginning and end of each swing phase has an amount of double-foot, where neither limb is in contact with the ground. As a result, the energy phase occurs for both leg and knee joints of the running gait cycle. As speed increases, the percentage of stance phase decreases.

**ABSORPTION PHASE**

The initial contact of the walking phase is referred to as the absorption period; in this period, the lower limb acts as a shock absorber for the body. Reducing the cumulative ground reaction forces passing through the limb, which can be up to three times greater than body weight.

As the foot strikes the ground, the body's footwork is generated by the shock protection of the hip extensor muscles, while the heel shock absorbers provide the necessary support for the leg. Proper self-acceleration requires a biomechanical pump 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 disabled athletes with physical, sensory and learning disabilities.

Local Programmes
Local disability sports officers are employed through a number of Local Authorities to develop local disability sport opportunities. There are 16 Local Branches in membership of SDS which provide access with regard to the SDS competition structure and additional funding assistance. 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, swimming, basketball, football, tennis and cycling. A full list of events can be found on the SDS website at www.scottishdisabilitysport.co.uk

Keg Sports
SDS has a number of key partners 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, coach and club development programmes. A number of sports including Athletics, Boats, Ball, Swimming and Wheelchair Curling are involved in these plans. The Keg Sports programme regularly generates interest and national and international competitions.

Athletes Academy
Established in 2004, the Academy aims to enhance the continued development of our most promising athletes and provide them with necessary support to progress their potential to participate in high performance sport. As a result there are now 17 athletes across 9 sports supported into the programme.

A selection of 600 junior events are listed below, a comprehensive list can be viewed on the events page of the SDS website. If any event you may wish to enter please contact your local contact details for contact details for contact for local branch contact details can be found at the back of this brochure.

Summer Camps
Scottish Disability Sport (SDS) in partnership with Capability Scotland and SportsScotland, is delighted to be running the 5th National Summer Sports Camp for young people with physical disabilities and learning disabilities. The details of these camps are as follows:

Page 13 CTA SPEEAD Final Report
Standing Stretch

- Stand with one leg in front of the other and hands at shoulder height against a wall.
- Ease your back leg further away from the wall, keeping it straight and press the heel firmly into the floor.
- Keep your hips facing the wall and the lower leg and knee in a straight line.
- Your head will be facing towards the wall.
- Repeat with the other leg.

Hip and Leg Stretch

- Stand with feet approximately two shoulder widths apart.
- Turn the feet and face to the right.
- Bend the right leg so that the right thigh is parallel with the ground and the right lower leg is vertical.
- Gradually lower the body.
- Keep your back straight and use the arms to balance.
- You will feel the stretch along the front of the left leg and along the hamstring of the right leg.
- Repeat by turning and facing to the left.

Shoulder Stretch

- Stand with feet approximately two shoulder widths apart.
- Bend the right leg and lower the body.
- Keep your back straight and use the arms to balance.
- You will feel the stretch in the front of the left leg and along the hamstring of the right leg.
- Repeat with the left leg.

Arm Stretch

- Stand with feet approximately two shoulder widths apart.
- Bend both of your forearms towards your body and place the sides of your feet together.
- Allow your arms to come up and out to the side.
- Resting your hands on your lower legs or elbows and ease both knees towards the ground.
- You will feel the stretch along the muscles of your thighs and groin.

Warm-up, Stretching and Cool-down

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 severe injury.

Every time you exercise your body needs time to adapt to exercise, so a gradual and modulated stretching programme needs to be built. Flexibility and suppleness is required for your chosen activity. You need to prepare and select appropriately for your chosen activity. You need to prepare and select appropriately for your chosen activity. You need to prepare and select appropriately for your chosen activity. You need to prepare and select appropriately for your chosen activity. You need to prepare and select appropriately for your chosen activity.

There has been a lot of discussion regarding the pros and cons of stretching over the past few years. Most of the experts’ studies have highlighted the need for further good-quality research before definitive conclusions can be drawn.

However, it is apparent that the age, weight and physical condition of the participant is important in determining the contribution stretching can make towards 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 performance is performed correctly and at an appropriate time.

There are two main types of stretches:

DYNAMIC

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

STATIC (also called isometric stretching)

These do not move but involve the targeted muscle groups being lengthened through the holding or "hold" is felt, then held until resistance against an imaginary 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 TSS will also contract the muscles of the lower limb in an identical pattern to the non-amputee during terminal stance. The time should be slightly less and as stated earlier there will be a reduction in forces as the limb prepares to strike the ground.

THP involving the knee with the prosthetic limb. Initiating a backward force prior to contact will not only accelerate the body forward, but also simultaneously ensure that the knee will remain in extension. Many transferred para-athletes also adopt an extended knee posture as they decelerate to the ground, although this is unnecessary.

TRUNK AND SIDES STRETCH

The trunk and sides stretching is very important, yet often difficult to master. In order to perform a side stretch, the body will need to be in a seated position. The TSS will place the hip and trunk in a position, which will allow the body to muscle forward momentum and increase the metabolic requirement. The trunk and sides stretch can also provide additional flexibility to the prosthetic limb and facilitate an increased trunk movement.

This overview of the biomechanics of upright running should help in understanding hip and knee mechanics as well as planning an appropriate training program. In turn, amputees will be better able to optimise their performance in order to achieve their goals.

Behind the Scenes

University of Miami School of Medicine, Department of Orthopedics, Division of Physical Medicine and Rehabilitation

References


**STATIC STRETCHING EXERCISES**

Stretching plays a vital role in medicine, exercise, and sports. Proper stretching can help improve flexibility, prevent injuries, and enhance athletic performance. Here are some key principles to keep in mind:

- **Preparation:** Stretching should be performed after a warm-up and before engaging in physical activity.
- **Intensity:** Stretch to the point of mild discomfort, not pain.
- **Duration:** Hold each stretch for 15-30 seconds.
- **Repetition:** Perform each stretch 2-3 times.
- **Consistency:** Incorporating stretching into your daily routine can yield significant benefits.

**Exercises:**

1. **Hamstring Stretch:** Stand on the straight leg, bend the other, and pull the foot toward the hip.
2. **Quadriceps Stretch:** Stand on the straight leg, bend the other, and pull the foot toward the hip.
3. **Calf Stretch:** Stand on the straight leg, bend the other, and pull the foot toward the hip.
4. **Lower Back Stretch:** Stand on the straight leg, bend the other, and pull the foot toward the hip.
5. **Standing Hip Flexor Stretch:** Stand on the straight leg, bend the other, and pull the foot toward the hip.
6. **Seated Hamstring Stretch:** Sit on a chair, bend the other, and pull the foot toward the hip.
7. **Seated Quadriceps Stretch:** Sit on a chair, bend the other, and pull the foot toward the hip.
8. **Seated Calf Stretch:** Sit on a chair, bend the other, and pull the foot toward the hip.
9. **Seated Lower Back Stretch:** Sit on a chair, bend the other, and pull the foot toward the hip.
10. **Seated Standing Hip Flexor Stretch:** Sit on a chair, bend the other, and pull the foot toward the hip.

**DYNAMIC STRETCHING**

Dynamic stretching involves active movements that help increase joint range of motion, improve flexibility, and reduce the risk of injury. It is particularly important for athletes and individuals engaging in physical activity. Here are some key benefits of dynamic stretching:

- **Improves flexibility:** Dynamic stretching helps improve the range of motion at various joints.
- **Enhances warm-up:** It prepares the body for physical activity by increasing blood flow and oxygen delivery.
- **Reduces risk of injury:** By increasing joint mobility, dynamic stretching helps prevent injuries during physical activity.

**Exercises:**

1. ** Hustle:** March in place, lifting both knees high.
2. ** High Knees:** Run in place, bringing the knees as high as possible.
3. ** Lunges:** Stand with feet hip-width apart, step forward, and lower the body into a lunge.
4. ** Leg Swings:** Stand with feet hip-width apart, circle the legs forward and backward.
5. ** Leg Raises:** Lie on your back, lift one leg straight up, and lower it slowly.
6. ** Side Lunges:** Stand with feet hip-width apart, step to the side, and lower the body into a lunge.
7. ** High Knees:** Run in place, bringing the knees as high as possible.
8. ** Leg Swings:** Stand with feet hip-width apart, circle the legs forward and backward.
9. ** Leg Raises:** Lie on your back, lift one leg straight up, and lower it slowly.
10. ** Side Lunges:** Stand with feet hip-width apart, step to the side, and lower the body into a lunge.

**Footwork:**

- **Cossacks:** Stand with feet hip-width apart, squat down, and shift the weight from one leg to the other.
- **High Knees:** Run in place, bringing the knees as high as possible.
- **Leg Swings:** Stand with feet hip-width apart, circle the legs forward and backward.
- **Leg Raises:** Lie on your back, lift one leg straight up, and lower it slowly.
- **Side Lunges:** Stand with feet hip-width apart, step to the side, and lower the body into a lunge.

**Leg Raises:**

- **Lunge:** Stand with feet hip-width apart, step forward, and lower the body into a lunge.
- **High Knees:** Run in place, bringing the knees as high as possible.
- **Leg Swings:** Stand with feet hip-width apart, circle the legs forward and backward.
- **Leg Raises:** Lie on your back, lift one leg straight up, and lower it slowly.
- **Side Lunges:** Stand with feet hip-width apart, step to the side, and lower the body into a lunge.

**Footwork:**

- **Cossacks:** Stand with feet hip-width apart, squat down, and shift the weight from one leg to the other.
- **High Knees:** Run in place, bringing the knees as high as possible.
- **Leg Swings:** Stand with feet hip-width apart, circle the legs forward and backward.
- **Leg Raises:** Lie on your back, lift one leg straight up, and lower it slowly.
- **Side Lunges:** Stand with feet hip-width apart, step to the side, and lower the body into a lunge.
Appendix 2 SPEEAD Conference Pamphlet

SPEEAD
Sporting Prosthetics National Conference 2009

PROFILES - KEYNOTE SPEAKERS

Elaine Bartlett
Elaine Bartlett is from Sweden, W13, UK and is a prosthetics user who has a background in snowboarding and became a sports prosthetics developer competing in downhill mountain boarding on “The Bartlett Trend”, a universal trend pattern. Elaine says “It is possible, everything is possible, it’s all about overcoming obstacles and accomplishing your goals everyday. This is a mission that I thrive in making it happen.”

Professor Helena Burger
Helena Burger MD, PhD is Professor of Physical and Rehabilitation Medicine and Medical Director of the Institute for Rehabilitation Medicine, University of Vienna. She has a special interest in orthotics and prosthetics, having spent years following those of upper and lower limbs. Helena is the medical doctor for the German Paralympic team and has been in attendance at all Paralympic Games.

Professor Nanette Murrie
Nanette Murrie is Professor of Biomechanics and Sports Psychology at the University of Strathclyde, Glasgow and is also a Visiting Professor at the BHSC Social and Public Health Sciences UCL, Glasgow University. She trained as a Physiotherapy teacher and after working in schools, she went to Pennsylvania State University USA with a Fulbright scholarship to pursue a PhD which she gained in 1983. Since then Nanette has taught at Glasgow University and has been in post at the University of Strathclyde for three years.

Gilmour Stevenson
Gilmour Stevenson is Chair of the UK Strength & Conditioning Association, with over 30 years of working within elite sport, managing and delivering coach education programmes, University Principal of the Life Institute of Physical and Recreational Education, Gilmour is now Director of his own company Sportsstudy Ltd, which trains coaches and professional sports coaching, coach education and strength and conditioning. In recent years, Gilmour has helped to facilitate the work of those with both lower limb and upper limb prostheses, and welcomes the opportunity to speak with those who are involved in the rehabilitation of prosthetics users.

http://www.strath.ac.uk/prosthetics/research/speead/speeadprofiles.html

SPEEAD Sporting Prosthetics National Conference 2009

REGISTRATION FORM

Please register me as a SPEEAD conference delegate

First Name: ____________________________
Surname: ____________________________
Email Address: ____________________________
Home Address: ____________________________
Postal Code: ____________________________
Business Telephone: ____________________________
Mobile Telephone: ____________________________

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

Plaque return this form to Linda Glanmor, National Centre For Prosthetics and Orthotics, Cumbernauld Hospital 131 St James Road, Glasgow G67 1AL, Scotland or email: linda.glanmor@nches.scot.nhs.uk

Form to be returned Friday 1st August, 2009

SPEEAD Sporting Prosthetics National Conference 2009

PROGRAMME

08.30 – 09.30 Registration and Refreshments
09.30 – 09.45 Welcome Conference Chair: Sarah Oears
09.45 – 10.00 The Opening Address: Professor Jim McDonald The Principal and Vice Chancellor, University of Strathclyde
10.00 – 10.30 Psychology of Physical Activity and Sports Participation: Masters and Burnham Keynote Speaker: Prof Nanette Murrie
10.30 – 11.00 Inclusive Coaching and Conditioning: empowering the champions of the future Keynote Speaker: Gilmour Stevenson
11.00 – 11.30 Morning Coffee
12.30 – 13.00 Sport and Recreation Activities for People with Limb Deficiency: USA perspectives Keynote Speaker: Gilmour Stevenson
13.00 – 14.00 Lunch & Exhibition
14.00 – 14.45 Interview and Discussion Panel led by Jamie Andrew and Ms. Linda Ransel: The future of lower limb prosthetics: perspectives of Jamie Andrew, Linda Ransel and Ms. Linda Ransel
14.45 – 15.15 Paralympic Athletes: inspirational champions or unrealistic role models? Keynote Speaker: Professor Helena Burger
15.15 – 15.45 Afternoon Tea and Exhibition
15.45 – 16.15 Free Paper Session 2: Sports and the team for people with limb deficiency: Perspectives of people: a review of the literature Group participation in sports for prosthetic users Jamie Andrew Deena Fisher Sarah Oears
16.15 – 16.45 Summary & Closing Remarks Sandia Sewell
16.45 – 18.00 Drinks Reception and Prizegiving for Black Paper Competition: Walk to The Heart of England (Boston Football Museum)
18.00 Close