

In this Issue:

- Site Review - Princess Alexandra Hospital, Brisbane
- Hop to it!
- C-Leg
- Website Update
- Recommended Readings

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Welcome to Issue 2!

It's been a busy few months since our last (first!) newsletter. While we've all been trying to keep up with clinical loads, there has been a lot of activity related to amputees and their care. ISPO held its 13th World Congress in Leipzig, Germany in May, in parallel with the ORTHOPÄDIE + REHA-TECHNIK trade fair. There were a few AustPAR members in attendance amongst the 20,000 visitors to both events - the proceedings are available online at www.ispoint.org, and while it's a massive document (over 1000 pages!), check out p585 for a poster presentation by one of our members. The next World Congress has been announced for Hyderabad in 2013, with ISPO Australia to hold a local event next year.

Also overseas, amputees have been in international headlines a lot, due to events in Haiti, Iraq, and Afghanistan. This may or may not be related to the high media interest in bionic technology, with many companies releasing information on advanced technology such as the myoelectric upper limb prostheses *iLimb*, and the *Modular Prosthetic Limb (MPL)* which is controlled through direct neural interfaces implanted in the brain. Otto Bock also demonstrated the new *Genium* microprocessor knee, which allows step-over-step stair ascent, at Leipzig.

Closer to home, Amputee Awareness Week is due to be held from 4-11 October - see www.limbs4life.com for details. Also, the NSW subgroup of AustPAR held its latest meeting at Otto Bocks Sydney premises in Bella Vista during August. Following up from the demonstrations of the C-Leg at the last meeting at Concord, Stephen & Shane demonstrated several other types of Otto Bock knee joints, providing a lot of valuable insight on functionality, training tips, and thoughts regarding appropriate prescription based on the amputee's function and goals. The rest of the meeting revolved around an update of events at ISPO, and discussions on clinical research, led by a presentation by Lisa Harvey from the University of Sydney Research Studies Unit. Presentations from the day are available on the *AustPAR* website.

The next NSWPAR meeting will be held in November at Westmead Childrens Hospital, full details to be announced. Meanwhile we hope you enjoy this edition of the AustPAR newsletter. Remember, submissions for future newsletters are always welcome, and can be made through the website, or by emailing us at support@austpar.com. Let us know if you've got something to say!

Site Review

Princess Alexandra Hospital, Brisbane **Can you briefly describe your Amputee service?**

Princess Alexandra Hospital is a tertiary hospital in Brisbane. Our Amputee Service includes a dedicated vascular ward, amputee rehab ward and general rehab outpatient service. There is also a weekly Queensland Amputee Limb Service (QALS) clinic on site, covering the south side of Brisbane. There are 1.2 Amputee Physio positions in the department. My position is the 1FTE and I mostly work in rehab but sometimes rotate to vascular or rehab outpatients, but my main responsibility is educating the other physios in managing their amputees on their wards, because obviously amputees pop up all over the hospital. I am also a resource about Qld for other physios working with amputees. The other 0.2FTE (one day a week) is dedicated to the QALS clinic. We have 3 other physios that have attend the Sydney/ Melbourne courses so we have some very experienced staff.



We have two Prosthetists on-site who make the interim prostheses for rehab inpatients and public patients through the QALS clinic. There are three private prosthetic companies in Brisbane whose representatives attend QALS clinics. Recent changes to Workcover means interim prostheses are funded through this scheme, so amputees with private funding or are under Workcover have their interims made by one of these private companies. Then all amputees have their definitive prostheses made by the private companies.

How is acute care managed at your site?

Acute care stump management is very conservative- soft dressings are used. Shrinkers are applied once clips/ stitches out at 21days. Rigid dressings are sometimes applied in rehab but mostly for protection. Interim prostheses are fitted by on-site prosthetist, once the wound is coping with shrinker sock 24/7 and air-bagging.

What are the interesting parts of working at your site?



At Princess Alexandra Hospital the geriatrician runs the amputee rehab unit where as rehabilitation physician runs the QALS clinics. We have a weekly multidisciplinary-led Amputee Discussion Group for amputees, good camaraderie between patients, and the prosthetists are 20m away from rehab gym so very handy.

Are there any challenges at your site?

Challenges include the time taken from casting to fitting, discharge planning to high-set houses (such as Queensland style houses), sourcing equipment for home in time for

Continued page 3

New Stuff...

- A page to list equipment, ideas, and tips for handling bariatric amputees... <http://www.austpar.com/acute/bariatric.html>
- All presentations from the NSWPAR meeting, held at Otto Bock, 6/08/2010. See the Latest News tab on the Home page.
- A new search facility, utilising Google to search the site locally, including the text within documents. The search box is on one of the tabs on the Home page... <http://www.austpar.com>
- Summary of PTB vs TSB sockets and liners, at http://www.austpar.com/prosthetics/components/tta_sockets/transtibial_sockets.html

Sign Up!

Want to receive the AustPAR newsletter, plus get updates on education, events, and news? Or tips on treatment, gait, or the latest in prosthetics?

Sign up at www.austpar.com. Not only will you receive the newsletter, but you'll also be included in all mailouts from AustPAR with updated information, tips, and invitations to participate in any of our activities!

Recommended Readings

Performance measures: prediction & correlations.

1. Parker K, Kirby LK, Alderson J, & Thompson K (2010). Ambulation of People with Lower-Limb Amputations: Relationship Between Capacity and Performance Measures. Archives of Physical Medicine & Rehabilitation, 91, Apr, 543-549.
2. Raya M, Gailey RS, Fiebert IM & Roach KE (2010). Impairment variables predicting activity limitation in individuals with lower limb amputation. Prosthetics & Orthotics International, 34, 1, 73-84.

Continued from page 2 - Site Review

discharge, and usually no stump compression early on. Also, rehabilitation staffing includes 2 physios and 1 assistant for 26 rehab beds. There is a limited outpatient service available for gait re-training so we often have to admit patients for intensive prosthetic training. There are also challenges in where is best to rehabilitate multi-traumas (eg spinal injury with amputation).

Heather Batten
Physiotherapist Advanced (Amputee Management),
Princess Alexandra Hospital, Brisbane, Qld.



Opinion - Hop to It!

Hop to it or not?

I'm often asked whether or not our amputee patients should be hopping on a frame to increase mobility and improve function in the acute and pre-prosthetic phases of rehabilitation. Another question is why one amputee is allowed to hop whilst another is not?

Hopping is the most advanced of all the jumping skills (1) and is used to test high level balance in generic balance scales such as the High Mobility Assessment Tool (2). A single hop requires good lower limb strength and joint control to provide propulsion and shock absorption at different phases of the manoeuvre. In series, hopping can be a significant strengthening workout and can contribute to aerobic fitness. But, given the high intensity and impact of this activity, you need to assess whether the individual client is up to hopping or not and whether there are any detrimental or flow-on effects.

Unfortunately, the intact limb of the amputee is very likely to be at risk of a number of problems either as a result of co-morbidities or their amputation. A high percentage of amputees will already have vascular and/or diabetic related disease which makes them more susceptible to skin breakdown, injury or deterioration of the intact limb. Norvell et al (2005) researched knee pain and OA prevalence in traumatic amputee and non-amputee veterans and found that trans-femoral amputees are 3 times more likely to develop knee pain in the intact limb (3). Gailey et al (2008) concluded that the stresses of compensating with the intact limb in ADLs may lead to degenerative changes in that limb.

So, the question is, should amputees be resigned to no hopping to delay inevitable degenerative limb changes?

Things to review prior to asking your amputee to "hop to it!" (in no particular order):

- Technique – are they a "pounder" when they hop? Can they co-ordinate and control the activity to involve both the upper limbs and lower limbs? Do they exhibit good balance when they swing through?

Continued page 5

Prosthetics: C-Leg

An extract from <http://www.austpar.com/prosthetics/components/c-leg/c-leg.html>. Visit the site for the full story...how it works, indications, benefits, risks, and training ideas.

The C-Leg is a uniaxial knee, allowing flexion up to 125 degrees, and full knee extension movements. There are two sensors which provide feedback to the processor:

- A sensor in the axis of the knee itself, which detects angular position and velocity.
- Sensors, or strain gauges, in the distal end of the tube adaptor, which reports on the direction and size of moments being applied to the foot.

When the amputee takes weight on the prosthesis, the sensors detect the forces around the foot, and the change in knee position and velocity towards flexion. The processor then acts to increase stance flexion resistance, providing the ability for stance phase stability, stumble recovery, and descent down stairs and slopes.

- Upper limb strength – triceps and shoulder girdle strength should be recruited to unload and absorb shock when using the parallel bars or a frame during the hopping manoeuvre.
- Footwear which is supportive, stable, fits well and provides adequate shock absorption properties.
- Intact limb pathology or disease – review for OA, RA, pain or surgery involving any of the hip, knee or ankle joints. Claudication, deterioration in skin condition of the leg or foot and changes in LL oedema should be monitored.
- Cardiovascular endurance for hopping.
- Falls risk – whilst amputation in itself increases the risk of falls, are there any other factors which heighten their falls risk (e.g. postural hypotension)?
- Sit to stand / Squat strengthening – a precursor activity to review the lower limb strength and control of the hip knee and ankle joints.
- Discharge needs – to what extent will the patient need this skill for discharge?

Craig Evans
Senior Amputee Physiotherapist,
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References

1. Tveter, A.T. and Holm, I. (2010). "Influence of thigh muscle strength and balance on hop length in one-legged hopping in children aged 7-12 years." *Gait & Posture* 32(2): 259-262.
2. Williams, G. et al (2005). "The high-level mobility assessment tool (HiMAT) for traumatic brain injury. Part 1: Item generation." *Brain Injury* 19(11):925-932.
3. Norvell, D.C. et al (2005). "The Prevalence of Knee Pain and Symptomatic Knee Osteoarthritis Among Veteran Traumatic Amputees and Nonamputees." *Arch Phys Med Rehabil*, 86, 487-93.
4. Gailey, R. et al (2008). "Review of secondary physical conditions associated with lower-limb amputation and long term prosthesis use." *Journal of Rehabilitation Research and Development*, 45(1): 15-30.

What's your opinion?

Do you have an opinion on hopping in lower limb amputees? Let us know if you've got any evidence, advice, or experiences for or against. Perhaps you've worked out a few tips to help frail, or vascular amputees to hop safely, or have discovered a brand of shoes that provide cushioning and protection. Or do you have any questions, or are seeking advice on this matter for a particular patient?

Email us on info@ustpar.com, and your opinion, evidence, tips, advice, questions and answers will be posted on a new page on the website, contributing to a new series of pages on practical ideas and troubleshooting for a range of common issues and problems. (Your comments can be anonymous if you choose, too!)

AustPAR Newsletter

Produced by Australian Physiotherapists in Amputee Rehabilitation, 2010, www.austpar.com.

To sign up, or unsubscribe from the newsletter, please visit http://www.austpar.com/contact/sign_up.html.

For submissions to the newsletter or the website, please email us at support@ustpar.com. There is also a separate Contact page on the website where you can send us a message. Submissions are welcome regarding any information on events, prosthetic technology, Physiotherapy techniques, new evidence, or just about anything else! However AustPAR does reserve the right to decline to publish inappropriate content in the newsletter or website.

Subjects within photographs published in this newsletter signed informed consent at the hospital site where the photographs were taken.

Tony Fitzsimons (Ed)