

Wishing you a Merry Christmas & a Happy New Year!

## New Head of the NCPO

Mr Rod Cooper, NCPO Lecturer, has been appointed as the new Head of the NCPO and will take office in January, 2002. Rod replaces Dr. Tim Bach, who will continue on a half-time basis as an NCPO staff member and will be responsible for honours and postgraduate supervision and research leadership. During Tim's term as Head there have been substantial changes to P&O including the introduction of honours and PhD programs, the move to new facilities at the La Trobe University Bundoora Campus and strengthening of the quality of the undergraduate program. A function to thank Tim for his valuable contribution to P&O will be held in the New Year.

## Changes to Staffing

Ms Kaisha Gurry, who has worked at La Trobe for the past year and a half as Lecturer in Orthotics and Clinical Education coordinator, will take maternity leave in 2002. Congratulations and best wishes to Kaisha and her husband, Michael.

As in previous years, a number of part-time, short-term contracts will be offered to individuals interested in contributing to clinical and laboratory teaching in 2002. Interested individuals should contact Dr. Tim Bach before December 21 on phone: (03) 9479 5884 to obtain further details and to register their interest.

## 2001 Graduates

The Governor of Victoria, Mr John Landy, AC, MBE attended the La Trobe University graduation ceremony on the Friday 28<sup>th</sup> of September, at which most of this year's prosthetic and orthotic students graduated. Sixteen P&O undergraduates who completed their studies in July received their testamurs during the ceremony. Three additional students graduated in absentia, one of whom was a conversion student. All students were awarded the B.P&O degree.

*P&O class of 2001 celebrates at the graduation ceremony.*



## Funding for Prosthetic and Orthotic Education

The University recently engaged external consultants Phillips Curran P/L to review the distribution of funding within La Trobe. The review ranked the relative strength of all courses offered by the University in terms of their demand, outcomes and viability. Course demand was based on ENTER scores, ratio of first preferences to places offered and recent trends in preferences. Outcomes were based on course retention rates, Course Experience Questionnaires and graduate employment rates. Viability rankings were based on course intakes and student to staff ratios.

The Bachelor of Prosthetics and Orthotics offered by the NCPO ranked among the highest courses in the University in terms of demand and ranked relatively highly in terms of outcomes. The NCPO has one of the lowest student to staff ratios in Health Sciences but is on a par with the national average for health sciences courses. Nevertheless, the

relatively high staff costs and the high costs of materials for student projects require a substantial subsidy from the faculty over and above the funds provided by the Commonwealth. The continued squeeze on funding for tertiary education has placed more pressure on the Faculty of Health Sciences and on the NCPO to reduce costs.

The NCPO is developing a plan to address this issue. The plan will involve some changes to teaching and assessment practices, new and repackaged course offerings in undergraduate, post-graduate and continuing education, increased clinic activity and increased support from the profession and the industry. An overriding principle in the plan will be that the quality of the current course and the quality of graduates will be maintained. Over the next few months, the NCPO will meet with profession and industry representatives to seek their advice and support for proposed developments.

## Curriculum Corner

Detail about the P&O curriculum can be found in the 'Course outline and subject descriptions' section on the NCPO homepage: <http://www.latrobe.edu.au/ncpo/>

### Reorganization of Lower Limb Prosthetics and Orthotics

The order of subject delivery within the P&O program will change in response to a suggestion made by NCPO staff that was supported by the recent course review. At present, lower limb orthotic subjects are delivered in second year and lower limb prosthetic subjects are taught in third year. Reorganization of the program will result in a "below knee" focus in second year and an "above knee" focus in third year. This restructure will offer minor rationalization of teaching anatomy, pathology, physiology and biomechanics, and will benefit students and clinical facilities.

Students may more easily transfer common concepts such as pathomechanics, alignment and gait effects between orthotics and prosthetics. Second year students will learn prosthetics and orthotics, which will enable them to undertake a clinical placement in either specialty, reducing the demand on orthotic facilities. Third year will include the most challenging topics that are appropriate to a later year of the program. Transition between years will be facilitated by continuity of specialty over Summer breaks.

The new structure of major P&O subjects is summarized:

#### First Year

1<sup>st</sup> Semester Introduction to Prosthetics  
2<sup>nd</sup> Semester Introduction to Orthotics

#### Second Year

1<sup>st</sup> Semester Theory & Applied Lower Limb Orthotics A (Below Knee Orthotics)  
2<sup>nd</sup> Semester Theory & Applied Transtibial Prosthetics

#### Third Year

1<sup>st</sup> Semester Theory & Applied Transfemoral Prosthetics  
2<sup>nd</sup> Semester Theory & Applied Lower Limb Orthotics B (Above Knee Orthotics)

In 2002, the NCPO will implement transition to the new program structure. As result, Transtibial Prosthetics will be delivered twice (to third year students in 1<sup>st</sup> semester and to second year students in 2<sup>nd</sup> semester). To allow this, a lot of support from Transtibial volunteer patients and from sessional lecturers and demonstrators will be required. NCPO Lecturer Mr Les Barnes will coordinate the prosthetic transition and can be contacted on phone: (03) 9479 5847 for further information. Above knee orthotics will be next taught in 2<sup>nd</sup> semester, 2003.

## NCPO Staff Research

NCPO research is published at conferences and in journals. An overview of a current staff research project is provided here

### Attentional demands during pathological walking

A new avenue of research has been instigated at the NCPO by Wesley Pryor, Associate Lecturer and PhD candidate. The research involves evaluation of the attentional requirements (mental effort required) for pathological walking. Wesley previously evaluated the effect of prosthetic malalignment on attention and showed that poorly aligned transtibial prostheses take more attention to use. In that research, subjects walked on a treadmill and an attentionally demanding task called the 'Stroop test' was used (Stroop, 1935). In continuing this research, it has become important to choose a test that is most sensitive to changes in attention as a result of motor disturbances. It was also unclear whether the treadmill required the same attention as overground walking. These two questions were addressed in a recent third year project, conducted by Ilse Vermuelen and Allison Correll, under the supervision of Wesley Pryor.

Ilse and Allison hypothesised that treadmill walking would require more attention due to the novelty of the task and altered proprioception. They reasoned that tests that were most sensitive to differences between treadmill, overground and a control condition (standing still) would be most appropriate for future evaluations.

Subjects walked overground, on a treadmill and stood still while performing four tests. Response latency (time taken to respond), error rate and walking velocity were measured. Response latency was used to evaluate task difficulty. The treadmill condition slowed down the response latency when compared to overground walking, which suggests that treadmill walking is more attentionally demanding. Interestingly, walking velocity slowed when people performed tests while walking overground, probably as a strategy to perform the tests more successfully. The most sensitive test was called a PASAT (paced auditory serial addition task) (Gronwall, 1977).

The study identified the most sensitive test and suggested that treadmill walking may be more difficult than overground walking because people cannot modulate their walking velocity. The project outcomes allow subsequent studies to be designed more appropriately and have implications for clinicians using treadmills or functional tasks in their work. More information about this research can be obtained from Wesley Pryor, phone: (03) 9479 5729.

#### Project support

A Health Sciences Faculty Research Grant of \$9,600.00 was recently awarded to Tim Bach and Wesley Pryor to support ongoing research in this area.

#### References

Gronwall, DMA, 1977, Percept Mot Skills, 367-373  
Stroop, JR 1935, J Exp Psych, 36-93.



## P&O Clinical Education

During November and December, twenty second year students are undertaking a three week placement in facilities along the east coast, from Launceston to Brisbane. This placement allows students to observe orthotic processes and put into practice their lower limb and spinal orthotic skills and knowledge acquired during the year.

The updated Clinical Education Guidelines can now be accessed via the NCPO web page:

<http://www.latrobe.edu.au/ncpo/>

If you require a hard copy please contact the Clinical Education Coordinator, Kaisha Gurry.

Changes to the fourth year assessment for Clinical Education have been made for 2002. These changes were the result of a University requirement to adjust subject assessment, the need to reduce the cost of clinical examinations and the challenge to reduce the time involved in examinations, given the increasing number of students. For 2002, each student will undertake one clinical examination (either Prosthetic or Orthotic) and students will not be aware of the specialty prior to the examination. At the last Clinical Supervisor's meeting, it was requested that a working party be formed to look at the examination format. Supervisors interested in contributing to the working party should contact Kaisha Gurry.

Minutes from the recent Clinical Supervisor's meeting have been distributed. If you did not receive a copy please contact Kaisha Gurry.

Further information about P&O Clinical Education can be obtained from the Coordinator, Kaisha Gurry, phone: (03) 9479 5864.



## Third Australian P&O PhD

Dr Michael Dillon was awarded a PhD earlier this year. Dr Dillon's thesis was titled "Biomechanical models for the analysis of partial foot amputee gait". Accurate anthropometric and inverse dynamic models were developed to better

describe the effect of amputation and prosthetic fitting on gait. The investigation offered new insights into how partial foot amputees walk and challenged common misconceptions about partial foot prosthetic function. The thesis can be viewed on line in PDF format, thanks to the Australian Digital Thesis Project, at:

<http://www.lib.qut.edu.au/adt-qt/public/index.html>

Dr Dillon completed a B.P&O (Hons) at the NCPO in 1995, then worked at North West Hospital. In 1997, he received a scholarship to undertake a PhD through the Centre for Rehabilitation Science and Engineering at Queensland University of Technology, which is directed by Professor John Evans. The project was supervised by Dr. Tim Barker.

Dr Dillon is now teaching transfemoral prosthetics for the Rehabilitation Engineering Centre at the Hong Kong Polytechnic University.

## Wanted: Used Prosthetic Components

The NCPO uses standard modular prosthetic components when teaching prosthetic subjects. Due to curriculum changes in 2002, we will be teaching transfemoral and



transfemoral prosthetics at the same time. This means we need to increase our stocks of components. In the past, facilities have donated excess stock to the NCPO for use in teaching.

If your facility has excess components from old prostheses, and would like to donate them to the NCPO for teaching purposes, please contact **Steve Hockey on phone: (03) 9479 5747** who will pick them up or arrange postage at our expense. We will examine and test each component, discard unsafe items and replace screws and bolts if necessary.

Components will only be used in our teaching program, during which students and volunteer client are carefully supervised by staff. At no stage are student prostheses taken away from the university. At the end of each project, the prostheses are disassembled and the components re-used.

We can use modular components from any manufacturer as long as they have metric threads. Prosthetic feet are useful too, if they are in a safe condition. So, if you are able, please start saving old components, and contact us early in 2002.

# Student Research Symposium

The Student Research Symposium held on October 22 was an outstanding success. The quality of the projects and presentations was very high. We expect that up to 15 of the projects will be presented at the ISPO Australia Annual Scientific Meeting in Alice Springs.

Many prosthetists and orthotists from Melbourne facilities attended at least part of the Symposium. We appreciate the contribution these professionals made to the discussion during question time and during breaks in proceedings. We also appreciate the support of P&O facilities in making time available for their staff to attend the Symposium.

Lunch and a closing reception were sponsored by Reis Orthopaedic and Surgical Services. We gratefully acknowledge Helmuth and Sue Reis for their support of the social aspect of our Symposium over the past two years.

The next Student Research Symposium will be held on October 28, 2002. Mark your diaries now!



*NCPO staff, students and guests enjoy a drink in the Clinic Courtyard following the Student Research Symposium, courtesy of Reis Orthopaedic.*

## NCPO in the Community

*La Trobe University staff are expected to contribute to community and professional activities. Some recent activities are listed here.*

### Ossur Advanced Transfemoral Systems

In September 2001, the NCPO and Advanced Prosthetics Centre, NSW (APC) cooperated to provide a course in *Ossur Advanced Transfemoral Systems*. Most of the materials and components were provided by Ossur, through APC. The NCPO provided the teaching venue and equipment. The three-day program was coordinated by Harvey Blackney of APC and was taught by Toby Carlsson, Director of Ossur European Services, with support from Jonathan Reynik, clinical prosthetist, Ossur.

Eighteen experienced Prosthetists participated in the course. All made Ischial Containment sockets with the new Ossur transfemoral silicone (one way stretch) liner for some very pleased volunteer patients. The prosthetists were from all states of Australia and were well supported by APC, who provided transport and accommodation.

### ISPO Australia Advanced Lower Limb Orthotic Prescription

The NCPO contributed to the organization of the *ISPO Australia Advanced Lower Limb Orthotic Prescription via Oregon Orthotic Systems Theory* course, which was held in October. Margaret Hodge, NCPO Lecturer and PhD candidate, convened the course on behalf of ISPO Australia. The course was taught by Kyle Scott from Oregon Orthotic Systems, USA, with assistance from Darren Pereira, St. Vincent's Hospital, Melbourne. The venue was provided by the Prosthetic and Orthotic Programs at the University of

New South Wales (UNSW). Convening support was provided by Ian Nelmes from UNSW; Jan Johnston, NCPO Receptionist; Anton Karak, Orthotics Australia and ISPO Australia Treasurer; Tim Bach, NCPO and ISPO Australia Scientific and Education Committee Chairman; Harvey Blackney of APC; Peter Hawes from the Royal South Sydney Community Health Centre; and Jessie Beard from Royal North Shore Hospital.

Thirty-four orthotists from many Australian regions attended the full program and there were 10 additional single day participants. Lower limb pathomechanics were explored, orthotic biomechanics were examined and a new, three-stage casting technique was practiced. The course was enthusiastically received by all participants and the presenters were commended on the high quality program.

### AOPA National Council

The Australian Orthotic and Prosthetic Association (AOPA) invited a representative from the NCPO to sit on the National Council, to facilitating communication between AOPA and the NCPO. Rod Cooper, NCPO lecturer and first year coordinator, is the NCPO representative and liaises with AOPA regarding relevant matters.

### ISPO Australia Executive Committee

ISPO Australia recently held elections for the Executive Committee. Margaret Hodge, who has served on the ISPO Australia executive since 1990, was elected to the office of Chairman. Wesley Prior, NCPO Associate Lecturer and PhD candidate, was elected as Secretary. Outgoing Head of the NCPO, Tim Bach, was elected as a Committee Member and re-appointed to chair the Scientific and Education Committee. The NCPO is well represented through these office bearers and supports ISPO Australia's activities in P&O education and outreach.

## New NCPO Web Page

The NCPO web pages have been updated to fit in with the new La Trobe University web structure. As usual our main page, which is illustrated below, provides the entry point for all the information on our site.

Along with the changes to the look of the pages, our address, or URL has also changed. It is now

<http://www.latrobe.edu.au/ncpo/>

We have also made some changes to our site. They include:

A new page for contact information:

<http://www.latrobe.edu.au/ncpo/docs/contact.html>

Information on the distance education initiative:

[http://www.latrobe.edu.au/ncpo/docs/sci\\_lec.html](http://www.latrobe.edu.au/ncpo/docs/sci_lec.html)

A page with information about the B. P&O course:

<http://www.latrobe.edu.au/ncpo/docs/courseinfo.html>

Our Student Pages are now password protected due to the confidential information kept on them and are off limits to the general public.

The rest of our site remains the same. If you have any queries or questions about the new pages, please contact



Steve Hockey on phone: (03) 9479 5747 or email [s.hockey@latrobe.edu.au](mailto:s.hockey@latrobe.edu.au)

## Quality Supervision 2002: a course for Clinical Supervisors

A course designed for clinical supervisors will be held at La Trobe University over two blocks, 7-9 February and 22-23 March, 2002. The aim of the course is to improve the knowledge and skills of clinical supervisors from a range of health science disciplines. The course has been developed by the Foundation for Quality Supervision, a multi-disciplinary team with extensive experience in health professional education at La Trobe, Deakin and Monash Universities.

## NCPO P&O Degree by Distance Education

*The Commonwealth Department of Education, Training and Youth Affairs (DETYA) awarded the NCPO and the University of New South Wales (UNSW) a joint grant of \$1,040,000, over three years (2001-03), to develop a Prosthetics and Orthotics degree via distance education. NCPO progress in the distance education program is reported here.*

Work has proceeded on the development of two subjects to be offered on-line:

Introduction to Clinical Practice (Wes Pryor)  
Introduction to Orthotics Theory (Rod Cooper)

Wes Pryor is developing a Virtual Clinic as the broad conceptual front-end to his subject, to provide a meaningful context for the topics covered in the subject. Much of the difficult ground work for the Virtual Clinic has been completed and development of the learning materials is underway. Links from the Virtual Clinic to the material will then be created.

Rod Cooper has completed a prototype module on the Management of Fractures. The module was transferred into the WebCT format and has been demonstrated to staff. Future modules will be developed using the Fractures module as a model.

Development work has stalled of late because the partners in the Distance Education project have encountered difficulties in the allocation of funds. This has created a climate of uncertainty in which it is difficult to spend the significant amount of time needed for the major development work. Once this hurdle is cleared, completion of these two subjects should proceed rapidly and the early phases of the next couple of subjects can commence.

The allocation of funding to the NCPO for Distance Education work and a revised project schedule have been suggested as means for resolving the difficulties. Work can proceed again as soon as these issues are resolved.

Further information about the Distance Education program at the NCPO can be gained from Ian Thomas, DE consultant, phone: (03) 9479 5787.

## Diploma Conversion Course Ends 2002

**The last intake into the La Trobe University P&O Conversion Course will be next year.** Students who enroll in 2002 will have a couple of years to complete their course.

After 2002, it will still be possible for a diplomat to gain a degree, however his/her course requirements will be decided on a case by case basis and will probably involve more study

than the Conversion Course. As University regulations allow up to 50% credit towards a degree based on prior learning, a diplomat student would be required to complete approximately two years of coursework to obtain a degree.

If you hold a Dip. App. Sci. (P&O) and want to convert to a Bachelor of Prosthetics and Orthotics, please contact Jan Johnston, School of Human Biosciences Reception, phone: (03) 9479 5787 by 1<sup>st</sup> February 2002.

## Clinical & Technical Note: Custom moulded silicon Achilles tendon prosthesis

*Clinical notes from Rod Cooper, NCPO lecturer in prosthetics and orthotics and technical tips from Stephen Hockey, NCPO technical officer.*

Recently, a 35 year old lady who had a tumor removed from her Achilles tendon area presented to the NCPO clinic. The initial operation involved a resection of the posterior third of the calcaneus and complete removal of the superficial compartment muscles (Soleus, Plantaris and Gastrocnemius). Following wound breakdown, a second operation was performed in which extensive skin grafts were placed over the posterior aspect of the calf. Interestingly, the woman still had grade 5 plantar flexion power and no disruption to ankle ROM.

An internal silicon calf implant was successfully inserted to improve the appearance of the leg, however a large concave scar area remained in the distal portion of the limb. This made it very difficult to fit shoes, placed the scar tissue at risk of breakdown through friction, and the lady was very self-conscious about the appearance of her leg. She attended the NCPO clinic for management of this problem.

An external silicon prosthesis was designed to fill the missing area, prevent shoe rubbing and protect the scar tissue. The internal surface of the device was moulded over a positive model of the affected limb and the external surface was modeled on a negative cast of the contralateral limb.

The silicon used to create the prosthesis was Otto Bock 617H43 silicon, with a shore hardness of 25. It was coloured with Otto Bock flesh pigment with a small addition of white pigment. The white pigment was important because if flesh pigment alone is used with silicon, the device turns out an unattractive, translucent colour.

A prototype was manufactured by laying silicon between the two moulds and compressing them together. Despite a large compressive force, a number of air bubbles formed during the curing process.

To overcome this, an improvised bell-shaped vacuum chamber was constructed by making a plastic 'check socket' over a mould of a bucket. The inner and outer plaster leg models, containing the silicon, were clamped together and



*Figures 1a and 1b. The plaster models enclosed within the bell-shaped vacuum chamber.*



*Figure 2. The completed silicon Achilles tendon prosthesis.*

placed on a standard vacuum forming table. The bell-shaped vacuum chamber was put over the moulds and table, and vacuum was applied to the plaster moulds inside. Figures 1a and 1b illustrate this vacuum process.

Finishing was performed using very fine grade sandpaper drums on the router at maximum speed.

The end product, illustrated in figure 2, was a highly cosmetic, custom-made silicon prosthesis that could be suspended to the limb by a sock, or by a skin adhesive when a dress or shorts were worn. This simple process could be used to manufacture custom moulded silicon products for most parts of the body.

For further information about this article or NCPO clinical services, please contact Rod Cooper on phone: (03) 9479 5862 or email: <Rod.Cooper@latrobe.edu.au>.

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