

HANDS ON



Ultrasound boosts our research

The School has recently acquired a real time ultrasound imaging machine. This will have two prime uses: firstly for students to assess the function of deep spinal stabilizing muscles such as lumbar multifidus and the deep abdominals, and secondly as a measurement tool for research projects.

Three research projects using real time ultrasound imaging have been carried out this year though the School, two under the supervision of Dr Peter O'Sullivan, extending his research into motor dysfunction in chronic spinal pain disorders, and one supervised by Dr Diana Hopper.

Details of these and other current Masters research follow. Summaries of all graduate student projects are available at the School website:

<http://www.curtin.edu.au/curtin/dept/physio/pt>

Master of Manipulative Therapy

SIJ pain syndrome

Stabilising strategies in subjects with sacroiliac joint pain syndrome (SIJ)

Beales, Beetham, Cripps, Graf and Lin, with co-researcher Anita Avery. Supervisors: Dr Peter O'Sullivan and Beatrice Tucker

This observational study examined the stabilising strategies adopted by subjects with a clinical diagnosis of SIJ pain syndrome during low-load activities, and the resultant effect of these strategies on respiratory patterns. Thirteen subjects with a clinical diagnosis of SIJ pain syndrome and an equal number of matched controls were studied using spirometry and real time ultrasound of the diaphragm and pelvic floor. Minute ventilation and pelvic floor and diaphragm movement were significantly different between the two groups and these differences were eliminated when the SIJ pain syndrome



• Dr Peter O'Sullivan (centre) works with Masters students.

group had stability of the pelvis enhanced with manual compression to the innominates.

Provocation Test

Pain and muscular responses to the median nerve neural tissue provocation test in subjects with cervicobrachial pain syndrome (CBPS)

Bourgoing, Eils and Garnevall.

Supervisors: Brigitte van der Heide and Bob Elvey

In 10 subjects with CBPS, the onset values of pain and muscle activity in upper trapezius and biceps muscles were collected while monitoring the range of elbow extension. Repeated measures were performed with the cervical spine in neutral and contralateral side flexion on both arms, using the asymptomatic arm as the control. Preliminary data seems to indicate an earlier onset of pain in the symptomatic arm. Muscle onset in relation to pain has yet to be analysed.

Lower back pain

The effect of different standing and sitting postures on trunk muscle activity in a pain free population

Grahamslaw, Kendell, Lapenskie, Möller and Richards. Supervisor: Dr Peter O'Sullivan

Patients commonly complain of exacerbation of lower back pain in

sustained standing and sitting postures. Many of these individuals are often observed to have poor deep abdominal and lumbar multifidus tone, as well as associated poor standing and sitting postural patterns. An EMG study in a pain-free population was undertaken. Its goal was to determine if there is a relationship between the activation of muscles in the global muscle system and the local muscle system in upright standing versus sway standing, and upright sitting versus slump sitting postures. Results indicate that internal oblique and lumbar multifidus are significantly less active in passive sway standing than erect standing postures, and are also less active in slump sitting than upright sitting postures.

Lumbar multifidus

A quantitative analysis of lumbar multifidus in patients with chronic lumbar segmental instability

Torkelson, Eardley, Elliott, Davey and Rabey. Supervisors: Dr Peter O'Sullivan and Dr Kathy Henderson

The purpose of this study was to reliably quantify the muscle-to-fat ratio and cross-sectional area of the lumbar multifidus in patients with chronic low back pain and a clinical diagnosis of lumbar segmental instability. Results were compared to the level above and show a significant increase in percentage fat at the diagnosed unstable level.

Traction SLR

Effects of Mulligan Traction Straight Leg Raise Technique on range of hip flexion and sagittal pelvic rotation

Cacho, McNee, Riches and Walsh.
Supervisor: Toby Hall

The aim of this study was to determine whether the Mulligan traction straight leg raise (SLR) technique would increase the range of SLR in normal subjects. Pelvic rotation and SLR were measured before and after application of this technique in 26 normal subjects. There was a statistically significant increase of 14 degrees (29%) following application of the technique, mediated via increases in both pelvic rotation and hip flexion.

Master of Sports Physiotherapy

VMO/VL ratios

An investigation of VMO/VL ratios in three weight-bearing exercises with varying hip rotation and knee flexion positions in normal subjects

Burne, Carmichael, Meyer and Peterson. Supervisors: Geoffrey Strauss and Dr Peter O'Sullivan

This study determined VMO/VL activation ratios in 30 normal subjects who performed a squat, a single knee bend and a lunge. Each exercise was performed with a knee flexion angle of 20 and 40 degrees, and with internal and external rotation of the hip. Significant main effects for both angle and rotation were observed. The lunge at 40 degrees knee flexion with hip external rotation resulted in a significantly greater VMO/VL ratio indicating facilitation of the VMO. These findings have implications for rehabilitation where preferential VMO activation is required.

VMO/VL fatigue

An investigation of fatigue in the VMO and VL muscles in subjects with patellofemoral pain syndrome compared to pain-free controls

Poon, Cheuk and Bacic. Supervisors: Dr Peter O'Sullivan and Geoffrey Strauss

This study compared the fatigability of VMO and VL muscles in patients with patello-femoral pain syndrome compared with pain-free control subjects. This was carried out during the performance of a 60-second single leg squat at a joint angle of 30 degrees of knee flexion. Median frequency (MF) and amplitude (RMS) measures of fatigue were determined from 60 x 1000 data points per muscle group. Data analysis revealed no differences between the MF and RMS values for the VMO and VL muscle groups and for the two subject groups, suggesting that of the VMO may not be an aetiological factor underlying patello-femoral pain syndrome.

Biofeedback

Does Real Time Ultra-sound (RTU), used as a biofeedback tool, significantly increase the ability to perform an isolated Transversus Abdominis contraction in normal subjects?

Brash, Caputi, Horne and Thompson, with co-researcher Felicity Kermode.
Supervisor: Dr Diana Hopper

Seventy-nine healthy subjects were recruited to participate in this randomised intervention study, 54 completed the study, attending all teaching and assessment sessions. The subjects were allocated into two groups, one being taught contraction of

transversus abdominis using conventional teaching methods, the other taught using RTU biofeedback. Subjects were assessed by a blinded assessor using RTU before, during and after teaching over a period of three weeks. In healthy individuals the use of ultrasound biofeedback did not enhance the ability to learn isolated transversus abdominis contractions.

Aussie \$ adds to allure of our higher degrees

Take advantage of the low Australian dollar and apply for one of our research degrees or professional Masters programs. Curtin University has established an international reputation for the Master of Manipulative Therapy and the Master of Sports Physiotherapy, and for the pure research degrees, the MSc and PhD. Areas of expertise among the current supervisory staff include the following:

Anatomy; Biomechanics; Cardiopulmonary Physiotherapy; Ergonomics; Gerontology; Manual Therapy; Movement Analysis; Neurophysiology — neuropathology; Neurological physiotherapy; Osteoporosis; Paediatric Physiotherapy; Pain management; Sports Injuries.

The coursework Masters are highly competitive courses and available fulltime (February to November). The Master of Sports Physiotherapy is also available half-time over two years.

In addition, the School offers a Graduate Certificate in Orthopaedic Manipulative Therapy which is a blend of a four week on-campus practical component plus a number of distance education units. The clinical component is taught by international educators and clinicians Kim Robinson and Toby Hall who are adjunct senior clinical fellows of the School.

Due to the international interest in our postgraduate courses, we have kept several vacancies for next year. If you are interested, please contact our Student Liaison Officer (email: physio@curtin.edu.au or phone 9266 3609) or postgraduate coordinator, Dr Diana Hopper at the IFOMT conference (Mobile 0401 558 343) or view our website.



• Brigitte van der Heide testing a student "patient".

Rural seminar was a “real inspiration”

The School conducted a Physiotherapy Rural Seminar, in Kalgoorlie in August and Bob Elvey, Peter O’Sullivan and a student group travelled by train to the Goldfields to meet and work with regional practitioners.

Held at the Kalgoorlie Regional Hospital, the seminar attracted 11 participants from Kalgoorlie as well as others from Esperance and Perth. It consisted of evaluation and treatment of patients organised by the local physiotherapists, and the presentation of students’ research.

The group had tours of the district after each day’s proceedings.

The aim of the seminar was twofold — to give rural physiotherapists an opportunity for continuing education and to give students the opportunity to see rural physiotherapy and rural Western Australia.

Warren Goes, from Goldfields Physiotherapy Service, who helped set

Pain is the principal problem

Pain, points out Max Zusman, is the most common reason for individuals seeking treatment from physiotherapists, and the “problem” they are most anxious to have resolved.

Max’s interest in the mechanisms and management — with physical treatments in particular — of pain, began many years ago. “It came from a quarter of a century of clinical frustration — trying to figure out which types of patients with pain would benefit from physiotherapy, and why!”

Since Max (who actually wanted to do law) first started physiotherapy at the behest of his father, he’s come a long, scientific, way, being one of 15, and the only male, to be admitted into the second intake of physiotherapy studies in 1955.

The year Max graduated, WA was engulfed by a polio epidemic.

“We’d all gone off on holiday, and were sent telegrams to come back.

up the seminar in Kalgoorlie, says it “took a bit of work to get together, but went down very well and received a lot of good feedback.” Warren says local practitioners would certainly put their hands up for another seminar.

“We were able to learn about the new research being done at Curtin and have Peter O’Sullivan and Bob Elvey lecture in their specialty areas.

“The gist of the whole course was to bring in patients with specific pain conditions. Peter or Bob would then discuss the type of conditions, the way to possibly diagnose them, and treatment.

“It’s rare that regional centres have access to professors and speakers of Peter and Bob’s quality. They’re sought after throughout the world. For us to get people of that calibre was a real inspiration and coup.”



• Max Zusman

“We hadn’t even got our marks yet. It was a nasty epidemic that affected adults - young men, like me, were being put in iron lungs.

“I got landed the pool job - no one wanted it because they thought you could contract the disease through the water. But I was young, and mad and silly, and not really frightened of anything.”

After working in private practice, Max got back into academe in 1979 after returning from a golf tournament in Israel, because his locum, (William) Denis Boyd, told him he was wasn’t doing it right.

Our School appeals to Michelle and Martin

Canadian Michelle Martin and Guernsey man Martin Rabey are pleased they chose Perth and the School for the Masters studies.

With a BSc in Physical Therapy from Edmonton, Alberta, Michelle has lived in Perth for almost three years.

She first visited Australia on holiday in 1995, then 1996 and finally 1997. She’s travelled all over Australia and chose WA mainly because of Curtin University and its reputation for evidence-based practice.

“Australia has a good reputation for manual therapists. I organized a job over the telephone and then, once I was here, the opportunity arose for me to do my Masters,” she said.

Although she finds the workload the heaviest she’s ever encountered, Michelle says the course is excellent, particularly with input from lecturers such as Bob Elvey and Peter O’Sullivan, in terms of clinical work.

“It’s wonderful to have input from people such as these - they’re recognized internationally.”

Among the advantages of studying here that Michelle sees is the weather and the lifestyle. “I’m a summer type, although I know everyone thinks that Canadians live on skis.”

Another drawback is the fact that her fellow students come from different parts of the world. “We all get on so well. It’s great for networking, especially if you like to travel.”

Martin grew up in Guernsey in the Channel Islands, but has lived in London for the past seven years.

Martin has a BSc in Physiotherapy from the University of Wales, College of Medicine and came to the School on the strength of hearing lectures given by Bob Elvey and Toby Hall.

“Of all the lecturers we heard in the UK, Bob and Toby impressed me most of all, and the research that gets published from Curtin seems so dynamic and forward-thinking.”

Overall, says Martin, the cost of studying here is more than in the UK, but it’s been worth it.

New research facilities at Bentley

The new buildings proposed for the move of Physiotherapy to the Bentley campus in mid-2002 encompass a variety of research laboratories and rooms.

The prominent feature of the new research laboratories is flexibility, with the ability to accommodate different uses in the same room. For example, the exercise science laboratory will house the treadmill and gas analysis system, and the Kin-Com and Isostation B-200 dynamometers. The electromyography laboratory will be able to accommodate a variety of sports and manipulative physiotherapy projects as well as women's health and cardiopulmonary research.

The movement analysis laboratory will be located separately in a building with a radical circular design. The sensitivity of the force platforms require a ground floor location, high ceilings are necessary to provide the ideal camera placements for three dimensional movement analysis.

As might be imagined, School staff have already created a very comprehensive suggestion list for new equipment.

Michelle and Martin From Page 3

"It's a lot of hard work, and I haven't had time to see much of the state, although I got to Augusta and The Pinnacles, but I've managed to do a lot of studying lying on the beach."

For Martin the advantage of studying here is that international students provide different perspectives, the postgraduate courses have been running longer and seem better-established, and the lecturers stand out more.

"At home we were fed information which you were supposed to take as gospel. At the School they teach you to think about things and question things a lot more, and not to take things for granted. That's one of the things I will take away with me."

FAREWELL FOR NOW

We hope you have enjoyed HANDS ON. This will be the last issue for 2000. Please give us your feedback.



• Paul Tinley works on gait analysis.

Gait analysis a key, says Paul

Keeping people pain free and on their feet is assisted, says Dr Paul Tinley, Head of the Department of Podiatry, by the maintenance of gait and maintenance of the well-being of the patient as a whole. This is particularly the case as people age and the fatty pad in the heel and the front of the foot diminishes.

Gait analysis, performed with the help of a slow motion video of the patient walking, assists in the evaluation of the parameters of gait. This, in tandem with analysis of pressure measurement of the foot, allows the podiatrist to accurately determine lower limb function.

At the moment, the Podiatry Department is running several research studies which link the lower limb and functionality. These include:

1. Investigation of the efficacy of orthoses in people with haemophilia
2. A study of the efficacy of orthoses as therapy for patients with plantar fasciitis
3. Stiffness in the big toe as a predictive of ulceration in people with diabetes mellitus

Paul suggests that there is great potential for collaborative research between physiotherapists and podiatrists. Enquiries are welcome on 9266 3613.

PAIN IS THE PRINCIPAL PROBLEM

From Page 3

"I realised I didn't really know what I was doing, so I went back to Curtin where Lance Twomey (now Vice-Chancellor) tactfully suggested I sit in on some lectures. I was stunned at the changes that had occurred."

Finishing postgraduate studies in 1987, Max started teaching part-time in 1989 at the School.

"It was the best thing I could have done. Teaching and research are stimulating and enjoyable."

According to Max, one of the most dramatic advances in pain research in recent years was recognition of chronic pain as a disease state in itself that is dependent upon both central and peripheral pain mechanisms.

The effect of this focus on

multidimensional pain mechanisms opened a whole new approach to the management of patients with pain.

Max suggests it might be time to give musculoskeletal physiotherapy — a victim of outmoded criticism — a new image. "It's imperative that any new image is seen to be evidence-based — if not yet entirely our evidence, then evidence arising from, and generally recognised by, other orthodox health care disciplines."

One of the original members of the Pain Society of WA, set up in the early 80s, Max was asked to join the prestigious International Association for the Study of Pain. He has presented nationally and internationally and recently completed an invited lecturing tour in Germany.