This third publication of ECU’s Faculty of Computing, Health and Science’s series Making a Difference, follows two issues in 2010, and again profiles some major achievements in health for ECU.

The Faculty continually strives to introduce new directions and enhance the quality of its existing offerings. For instance, ECU’s Master of Nutrition and Dietetics received provisional accreditation from the Dietitians’ Association of Australia (DAA), meaning that graduates are eligible for full membership of the DAA and can apply for Accredited Practising Dietitian (APD) status. As well, Exercise and Sports Science Australia (ESSA) has re-accredited the Bachelor of Science (Exercise and Sports Science) and the Bachelor of Science (Exercise Science and Rehabilitation) degree programs. These accreditations allow fourth year graduates from these programs to register as accredited exercise physiologists and to apply for Medicare provider status.

On the research front, the Faculty’s commitment to high quality research that contributes positively to our society is paying off. In our aim to develop practical solutions to current problems, the Faculty has played a key role in the achievement of $5.6M of Collaborative Research Networks Program funding for ECU, with five of the six ECU projects being led by Faculty staff:

- Professor Donna Cross leading the Promotion of Mental Health and Wellbeing in Young People project
- Professor Rob Newton leading the Exercise Medicine for the Prevention and Management of Chronic Disease project
- Professor Cobie Rudd leading the Integrated Health Services to Enhance Community-Based Health Care project
- Professor Kamal Alameh leading the Nano-photonics and Nano-electronics to Support National Frontier Technologies project
- Professor Paul Lavery, leading the Protection of Coastal Ecosystems and Marine Resource Management project.

The breadth of engagement with the communities we serve is developing further in the health space, with the Assistant in Nursing Program, a partnership with Sir Charles Gairdner Hospital. This partnership provides meaningful employment for nursing students while they complete their studies, as well as offering one solution to some of the current workforce issues. We’ve also seen nursing students undertake community placements in Tanzania and Laos, adding to the rich international experiences we build into our courses. The Faculty’s speech pathology team has established important relationships to offer more regional and rural experiences for their students, including with the Geraldton Regional Hospital and Geraldton Regional Aboriginal Medical Service. Our Occupational Therapy honours students undertake their research projects so they address industry-identified topics of importance for key health organisations such as the Telethon Institute for Child Health Research, St Bartholomew’s House and Princess Margaret Hospital.

In this volume, we profile what is just a snapshot of our collaborative efforts and their impact. As well, we provide a look at the path we are taking; a journey I encourage you to join us on.

Professor Tony Watson
Deputy Vice-Chancellor (International)
Executive Dean, Faculty of Computing, Health and Science

“The only constant is change” said Hérakleitos, an ancient Greek philosopher. And so the same can be said when reflecting upon the changes in health at ECU since the release of the last volume of ECU Health – Making a Difference.

The $4.642m Commonwealth funded project that ECU achieved in May 2010 under the Increased Clinical Training Capacity (ICTC) program has now resulted in the Interprofessional Ambulatory Care program being a fully operational entity and preparing to enter Semester 2, with the same vigour that has propelled the project to date. Commitment from health disciplines to this Interprofessional Ambulatory Care program has been excellent, with some disciplines allocating 50 per cent of their student placements to the program. Student feedback has been remarkably positive, with 90 per cent of students in Semester 1 stating they would recommend an Interprofessional Ambulatory Care program placement to others.

A rising from this large program is the development of an on-going education program to support interprofessional learning-specific clinical supervisors. Support of clinical supervisors was identified as an area for development in the 2008 National Partnership Agreement on Hospital and Health Workforce Reform as an area where work needed to progress. It was also identified as an area for development in the Health Workforce Australia Clinical Supervision Support Program directions paper released in April 2011.

In another key related focus at ECU, simulated learning in health, this past few months has seen the State Government award the ECU Health Simulation Centre the contract to provide high fidelity simulation training programs to health professions in WA, including anaesthetists and emergency physicians. Work has recently been undertaken to adapt the ECU Health Simulation Centre to accommodate these training programs including the delivery of a high fidelity manikin that has the ability to respond, in real-time, to the most sensitive of changes.

Other examples of some of the simulation-based research and resource development include:

- Successful Interprofessional Ambulatory Care Unit health simulation challenges where health students from ECU and medical students from UWA participate in observational simulated challenges addressing human factors in health care teams
- Physiotherapy lecturer Shannon Williams was an invited speaker at the World Confederation of Physical Therapy Congress in June, presenting on a research project which looks at physiotherapy students’ perception of using simulation in the assessment process.

The health team at ECU continues to create opportunities for ECU health students that offer a level of diversity and innovation, clearly enhancing both their learning and research. There is also evidence that our approach is making a difference to the health and wellbeing of individuals, our local communities, and the broader population as well.

Professor Cobie Rudd
Pro-Vice-Chancellor (Health Advancement)
2011-2012 National Teaching Fellow (Australian Learning and Teaching Council, Australian Government Department of Education, Employment and Workplace Relations)
Edith Cowan University (ECU) continues to expand in health research and undergraduate and postgraduate programs. This year has seen increasing student enrolments in health areas, the development of a new health School, and significant research gains at ECU. A range of achievements, some profiled in this Volume Three of Making a Difference, are testimony to ECU’s commitment to building on our strengths and providing many unique opportunities for our students to excel and be noticed for their skills and work-readiness.

CONTENTS

MAKING A DIFFERENCE ...

New Health School: New Opportunities 5
Interprofessional Ambulatory Care Unit at ECU 7
Developing a Global Diagnostic Tool to Detect Alzheimer’s 10
Enhancing Nursing Resources to Improve Patient Outcomes 12
Controlled Exercise Treating an Incurable Post-Cancer Condition 15
WA’s Offshore Workers Beating the Heat with Ice Slushies 16
Working with Industry to Decrease the Risk of Melanoma 18
Eccentric Exercise to Improve Muscle Strength and Mass 20
Diets to Defy Dementia: Staving off Dementia through Healthy Eating 23
‘Reality Bites’: Protecting and Educating Kids about Online Dangers 24
The Science of Football: A New Degree in the ‘World Game’ at ECU 26
Indigenous Programs to Change Attitudes and Health Education 29
ECU Health Staff Snapshot 30
Reshaping the Faculty

From August 1, 2011 the School of Exercise, Biomedical and Health Sciences became the School of Exercise and Health Sciences after transfer of the anatomy, physiology and human biology areas of scholarship to the School of Medical Sciences.

The School of Nursing, Midwifery and Postgraduate Medicine became the School of Nursing and Midwifery after the transfer of Paramedical Science and Postgraduate Medicine to the new School.

The School of Medical Sciences will become home to the Centre of Excellence for Alzheimer’s Disease Research, the ECU Melanoma Research Group, the Systems Intervention Research Centre for Health (SIRCH) and the Parkinson’s Centre (ParkC).
After three years of intensive investigation, analysis and review, Edith Cowan University has established a new School that promises to reshape ECU’s highly-regarded Faculty of Computing, Health and Science, paving the way for future expansion into new fields. New directions will build upon the strengths of the Biomedical Science, Paramedical Science and Postgraduate Medicine courses and research into neuroscience areas (Alzheimer’s disease, Parkinson’s disease and Huntington’s disease) and melanoma, the fastest growing cancer.

The Executive Dean, Professor Tony Watson, has high hopes that the provision of postgraduate degrees in medical sciences will broaden the attraction of ECU as an internationally-recognised centre of excellence in tertiary education by anticipating the demands of the future. As ECU’s Deputy Vice-Chancellor (International) he has experienced first-hand the growth in demand for this facility, particularly in South-East Asia and China.

“China’s teaching hospitals in particular are looking for exactly this opportunity,” he says. “Courses in medical sciences are in very high demand, with no sign that existing facilities can answer the need. On a recent trip to China their leading educators weren’t asking me why, they just wanted to know how soon.”

Associate Professor Moira Sim has been appointed as the Head of the School of Medical Sciences (SMS) which commenced operation from the first August 2011. Associate Professor Sim is a general practitioner and specialist addiction medicine physician who has strong links with health professionals in the community, hospitals and the non-Government sector. She has played a key role in programs which promote patient empowerment and active participation in the care team as well as interprofessional teamwork.

Across the full range of courses, ECU’s enviable facilities for simulated learning environments and interprofessional learning will provide a strong platform for clinical education, giving students the critical skills, knowledge and experience valued by employers.

Our courses allow undergraduate entry into paramedical science and graduate entry for paramedics to courses in critical care and community paramedicine.

The new School is housed at ECU’s Joondalup Campus where the physical facilities required to support the courses already exist.

“The recently-established Australian Society of Physician Assistants provides a professional body for graduates, and is committed to working with all stakeholders to develop and support the introduction of Physician Assistants into the Australian healthcare system.”
INTERPROFESSIONAL AMBULATORY CARE UNIT AT ECU

With, from and about... the three tenets of interprofessional education and mantra for the project team working within the Interprofessional Ambulatory Care (IpAC) Unit at ECU. Interprofessional learning has previously been highlighted in the ECU Health Brochure series (v.1 Feb 2010) and since then, a fully operational IpAC unit has been established on the Joondalup Campus as well as external community-based sites, offering health students a clinical placement in an interprofessional practice environment.

IpAC is an initiative established with funding of $4.6 million from the Commonwealth Government under the Increased Clinical Training Capacity (ICTC) Program. “This grant represents an opportunity for ECU to emerge as a leading force, nationally and internationally, in the field of interprofessional practice and innovative interprofessional learning and teaching resources” says Professor Cobie Rudd, Pro-Vice-Chancellor (Health Advancement) and program lead.

ECU has developed the IpAC program which includes two components; a University-based clinic as well as applying the model to external sites.
Under the supervision of specifically trained interprofessional learning (IPL) supervisors, students learn how to provide education and support for those who have chronic health issues. This unique program sees students from health disciplines participating together in client consultations that give them real life experience as a member of an interprofessional team in a clinical setting.

“For patients it’s what healthcare should be about – the whole person,” say Professor Rudd. “For students, it’s about how different disciplines can work best together with the patient’s needs as the focus. The area of focus for this client-focused student learning is chronic disease prevention and management in the broadest sense, and includes specifically developed care packages for the students to apply to this client group.”

Throughout the development of the IpAC Unit, managed by Coordinator Caron Shuttleworth, the project team has worked with representatives from each of the ECU health disciplines and the ECU Health and Wellness Institute, Vario Wellness Clinic to identify and develop a credible model of delivery that offered new clinical placements for health students.

Since the commencement of student placements in 2011, over 200 students have been supported by the IpAC program to achieve their clinical practicum hours. The IpAC program will continue to provide clinical placements throughout 2011, incorporating the varied discipline clinical practicum requirements whilst providing the students with positive and highly valuable clinical placements.

Integration of Interprofessional Learning (IPL)

The IpAC program provides health students with an interprofessional learning (IPL) experience and aims to inspire and support the health student in their chosen profession where lifelong learning has a vital role.

IPL also provides an opportunity to change the way we think about educating future health workers, to step back and reconsider the traditional means of healthcare delivery; the aim is not just to generate a change in educational practices but a change in the culture of healthcare outcomes and delivery. IPL aims to produce health workers who are willing and able to deliver healthcare through collaborative practice.

Students on clinical placement in the IpAC program have the opportunity to observe interaction between health professions, improve their knowledge and collaborative skills, while clarifying the roles and responsibilities of the professions involved. The aim of interprofessional collaboration is to enable creative solutions, prevent duplication and ultimately improve health outcomes for the client.

Engagement with the Community

The IpAC program has worked closely within the local community to develop programs that fulfil the needs of chronic disease sufferers. “The IpAC project team has developed and will continue to deliver care package programs responding to the changing health needs of the broader community” says Professor Rudd.
Clients attending the IpAC Unit on the ECU Joondalup Campus can expect to benefit from the care package through the provision of a holistic care program tailored to the clients’ chronic disease, consultation supported by experienced health professionals, access to a variety of health and wellness assessments and ongoing support and education to aid chronic disease self-management.

A new program recently developed with the project partner Ramsay HealthCare, Joondalup Health Campus (JHC), is the cardiac exercise program. This program complements the existing cardiac education program provided by JHC. The IpAC program anticipates supporting exercise physiology students through the cardiac exercise program in Semester 2 in 2011.

Interprofessional Simulation Events

The IpAC program developed and hosted the first of several simulation events on April 12, 2011. “The aim of the Interprofessional Learning (IPL) Simulation Challenges offered by the IpAC program is to provide health students and health professionals an opportunity to develop knowledge and skills in interprofessional collaborative practice” said Professor Rudd.

Students and health professionals who attended the evening witnessed a medical emergency scenario re-enacted by a team of professional actors. Participants had the opportunity to meet the actors, whilst they were still in character, and provide feedback to them. The actors then re-enacted the scenario, incorporating the audience feedback. This allowed the students and health professionals to observe how behaviour, attitude and communication can have significant impact within the interprofessional team and to develop an understanding of the importance of interprofessional collaboration. “The scenarios were brilliant and demonstrated all the learning objectives. A great way to illustrate different problems faced by all healthcare professionals” said a student participant.

Professor Rudd said “applying learning through simulation to improve how health professionals can better work together is critical to delivering high-quality care.

“This event was a wonderful opportunity for students and it’s exciting to see the application of simulated learning used to support and enhance health education,” she said. “Simulation is a powerful way to convey key messages and engage students and the positive feedback from students is great testimony to that.”

The simulation event received positive feedback with many health professionals and health students keen to attend further simulation events planned for 2011.

Interprofessional Education – Definition

“Interprofessional Education occurs when two or more professions learn with, from and about each other to improve collaboration and the quality of care”

Centre for the Advancement of Interprofessional Education (CAIPE) 2002

The IpAC program offers a range of care packages including: Communication for Everyday Living, Diabetes Management, General Wellness / Healthy Ageing with a Chronic Disease, Weight Control and Cardiac Rehabilitation.

The IpAC program supports health discipline clinical placements for ECU students in Clinical Psychology, Exercise Physiology, Mental Health, Midwifery, Nutrition and Dietetics, Nursing, Occupational Therapy, Paramedicine, Physiotherapy, Speech Pathology, as well as medical students from UWA.
DEVELOPING A GLOBAL DIAGNOSTIC TOOL TO DETECT ALZHEIMER’S

In a world-first development in Alzheimer’s disease research, Australia and India will collaborate to test pre-symptomatic indicators of Alzheimer’s Disease (AD) across two populations under a program for which funding is being sought from the national governments of both countries.

The partners in the broadly based diagnostic project are being brought together by Professor Ralph Martins, Foundation Chair of Ageing and Alzheimer’s at ECU. On a recent tour of India he established relationships with six leading medical and research centres specialising in aged care and dementia, and has high hopes of including them in the new consortium.

“We are well down the road of developing a panel of blood markers that will show, through a simple set of tests, if an individual is developing amyloidosis in brain tissue,” Professor Martins says. “Once we have a set of five to nine highly reliable markers, we need to validate them in at least two populations, to ensure that we have a global diagnostic tool. Our intention is to attain a set of markers that will ensure that if blood analysis shows an individual has AD, then the diagnosis is beyond doubt.

“India and Australia have two distinctive gene pools, lifestyles and diets, particularly among metropolitan Australians and rural Indians. India also faces the onset of a wave of AD as its huge population ages, becomes more Western in its diet and more sedentary in its lifestyle. At the same time, it has already advanced beyond Australia in some areas of patient care, for example, and the study of some elements of diet.”

Professor Martins was impressed by the Nightingales Centre for Ageing & Alzheimer’s in Bangalore headed by Bangalorean of the Year for 2011, Dr Radha Murthy, which opened recently with about 70 patients. “They have on their staff a psychiatrist, a neuropsychologist, a clinical psychologist and community workers as well as the usual nursing staff - something you wouldn’t find in a similar facility in Australia. With these resources they can take in an AD patient, create a care prescription specifically tailored to that person, and then send them with that defined care program to an aged care facility or back to their families.”

India lacks some resources where Australia has strengths, such as an ability to use imaging to detect beta amyloid in the brain. In the recent three-year Australian Imaging Biomarkers and Lifestyle Study of Ageing, led in WA by ECU, it was demonstrated that 30 percent of people aged 60 or older have beta amyloid deposits in their brains. The Perth and Melbourne partners in that study have the only two Position Emission Tomography facilities in Australia, and through ECU and the McCusker Foundation PET, beta amyloid imaging can be made available to the Indian collaborators.

“Once we have identified people with known blood markers that predict a high probability of amyloidosis, we will be able to confirm deposition with PET scanning,” Dr Martins says. “Early diagnosis is crucial. It can take 15 years to develop AD, but once the symptoms are clear it is probably too late for intervention. While there is certainly no silver bullet that will prevent onset, there is a known range of dietary, lifestyle and exercise changes that will at least slow onset, and the promise of new drugs that might revolutionise treatment.”

“Almost everyone who lives long enough will develop Alzheimer’s disease. We find beta-amyloid present in the brains of 20% of healthy 65-year olds, but in 85% of those older than 85.”

Professor Martins intends to bring much of the continuing research under the umbrella of the Collaborative Research Centre for Mental Health, which was announced in December as one of four CRCs successful in the 13th round of Commonwealth funding. In addition, Parkinson’s disease and schizophrenia research will be brought into the CRC, in a bid to identify their own biomarkers, calibrated by brain imaging, and to develop diagnostic kits.

The CRC was granted $23 million from the Federal Government. Participants include ECU, CSIRO, aged care provider Hall & Prior, Melbourne’s Mental Health Research Institute, the McCusker Foundation, Mercy Care and Pfizer.
Antioxidants are well known for their effect on some of the elements of Alzheimer’s disease. They help to neutralize highly oxidizing hydrogen peroxide produced by toxic beta-amyloids in the brain, and by a process not yet fully understood, they interfere with the bonding of beta amyloid to form plaque.

Nature provides a big range of antioxidant sources, which often find their way into the latest popular diets in supermarket magazines as the magical solution to prevent AD. Though clearly this is not the case, there is generally a basis of truth. Ellagic and gallic acids in pomegranates, for example, have been shown to reduce levels of beta-amyloid in the brain in AD.

“Folk legend in India suggests that Indians who eat a lot of curry won’t get AD,” Professor Ralph Martins says. “There are several problems with this. First, there is no single prevention or cure for AD. Second, the active ingredient is curcumin, which is the principal natural phenol found in the popular spice turmeric and gives it its yellow colour, but it is not easily absorbed in the digestive tract. Most of it simply passes through the body.

“However, this gives us a research opportunity. What might be the consequences of finding a way to absorb most of a dose of turmeric? I found in India that turmeric is traditionally ground up and mixed into hot milk as a dose for children with coughs and colds and to help heal their wounds. There is a suggestion that the curcumin bonds with milk molecules and is then absorbed into the body, where it rapidly reports to the brain.

“We intend to test that theory at our partnering facility in Bangalore, where they have trained medical staff able to undertake a pilot study. We also intend to test the product of an Indian company that says it has isolated the active ingredient in curcumin and can produce it in tablet form.”

Another natural product that has a long tradition in India for its medicinal properties is Amla, the common name for the Indian Gooseberry (Phyllanthus emblica). “Amla has a powerful effect in raising the level of high-density lipoproteins, the so-called good cholesterol, which is protective against AD,” Professor Martins says.

“An Indian company is producing an Amla product in capsule form in Germany and the United States as a dietary supplement, and in collaboration with them we have started to test its effects in a small trial here at ECU. This company has also made some advances in extracting active agents from pomegranate juice, which we will also test. Although these clinical trials are small pilot studies at this stage, encouraging results could lead to large-scale trials if we can obtain adequate funding,”
Florence Nightingale understood the power of statistics. Tutored in mathematics as a girl by her father, she is credited with having developed the polar area diagram, a variant of the pie chart used to quickly and visually explain health data to politicians and bureaucrats who were otherwise disinterested in the healthcare lessons of the Crimean War.

More than 150 years later, ECU’s Head of the School of Nursing and Midwifery, Professor Di Twigg, still finds it critical to follow the Nightingale pathway in collecting and presenting validated healthcare data to guide healthcare policy and funding. A current concern is the push to reduce hospital operating costs by reducing the intensity of nursing.

“In terms of patient outcomes, it is clearly counter-productive to cut the number of nursing hours in hospital wards, to reduce the average qualification of staff in those wards, or both,” she says. “The number and quality of nursing staff is critical to patient outcomes.

“Our recently-published study demonstrates that properly staffed hospitals have reduced mortality rates and very significant improvements in a range of other nurse-sensitive outcomes.”

The study led by Professor Twigg examined a change in WA hospitals in 2002 when the Australian Industrial Relations Commission ordered the introduction of a staffing method known as “nursing hours per patient day.” NHPPD staffing levels were allocated to each ward that had been examined and classified according to measures such as patient complexity, intervention levels, high dependency bed numbers, patient turnover and the mix of emergency and elective patients.

“This policy change gave us the opportunity to study the change in nurse-sensitive outcomes,” Professor Twigg says. “The linkage between higher nurse staffing levels and improved patients outcomes is well known. What we wanted to validate was the risk inherent in reducing nursing levels below those introduced by NHPPD requirements, to help ensure that policy changes like nursing budget cuts were no longer considered an option.”

“Our challenge is to clearly articulate evidence that the best way to minimise healthcare costs is to improve nursing resources.”

The retrospective analysis reviewed data from 236,454 patient records and 150,925 nursing staffing records across three of Perth’s teaching hospitals in an interrupted time series over four years, and was the first study to examine this nurse staffing policy.

“The results provided a resounding validation of the improved outcomes available from recognising the need for mandated nurse staffing as a national policy,” Professor Twigg says. “With increased nursing hours we measured a 25 to 26 per cent decrease in patient mortality rates. Surgical patients had a 54 per cent drop in central nervous system complication rates, a 17 per cent decrease in pneumonia and a 37 per cent reduction in ulcer, gastritis and upper gastrointestinal bleed rates across the three hospitals’ NHPPD wards.

Australia’s coming nursing crisis results from a confluence of demographic factors. The rising average age of the population will generate rapidly increasing demands for healthcare at a time when more than a third of Australia’s nursing workforce – those 50 and over – are likely to retire. As early as next year, according to current workforce projections, there will be a shortfall of 61,000 registered nurses in Australia.

“One of the worrying elements of this is a tendency to reduce the skills mix in the nursing workforce, by substituting enrolled nurses for registered nurses, and filling that gap with nursing or healthcare assistants,” says Professor Di Twigg. “We know, from a series of studies, that patient outcomes will suffer.”

Professor Twigg has collaborated with a team of healthcare researchers to review studies into the impact of nurses on patient morbidity and mortality. In contrast to the NHPPD study, where the focus was on nursing hours, this review focused on the professional quality of nursing and, in particular, patient outcomes where a higher proportion of registered nurses were employed.

“Patients admitted to hospitals, by definition, need 24 hour surveillance and the resources to respond appropriately to medical needs at any time of the day or night,” Professor Twigg says. “Registered nurses are already under pressure, with their workload and responsibilities increasing as the skill mix has changed. They are now less satisfied overall with their working conditions, and more likely to resign or even leave nursing altogether.”

The comprehensive review, published in Australian Health Review, revealed robust evidence nationally and internationally that surgical patients with a higher level of registered nurse staffing experienced reduced adverse outcomes. Using a measure of registered nurse hours per inpatient day, it is clear that higher rates lead to reduced rates of outcomes such as urinary tract infection, pneumonia after major surgery, thrombosis and pulmonary compromise in surgical patients, medication errors and patient complaints.

“We believe we have exposed a lack of appropriate policy response to evidence of the relationship between registered nurse-rich care and patient outcomes,” Professor Twigg says. “Patient safety is a responsibility that must be shared between policy makers and the nursing profession, particularly as we can show that improvement in nurse staffing is a cost-effective investment for Australia’s health system.”
“We observed improvements in eight nursing-sensitive outcomes after the NHPPD method was introduced. One hospital saw a 54 per cent drop in pressure ulcers, another reduced the incidence of deep vein thrombosis by 59 per cent. If we adopt recent changes made in the American system of not funding healthcare for hospital-acquired problems such as pressure ulcers, these reductions will also be important for healthcare budgets.”

The research results, which have been published in the high-impact International Journal of Nursing Studies, do not demonstrate that the NHPPD method provides the ideal level of nurse staffing, either in terms of the amount of ward care required or the ideal skill mix for those nursing teams.

“What we have shown through this empirical review, however, is that patient safety can be improved by analysing and answering the needs of each ward rather than relying on a ‘one size fits all’ approach,” Professor Twigg says. “The NHPPD analysis has also provided a benchmark against which the outcomes of any nursing policy changes can be compared, to determine whether they improve or reduce patient outcomes.”
Years of research into the efficacy of exercise for post-treatment cancer patients has resulted in a unique program being undertaken by the Cancer Council of Western Australia called ‘Life Now’, supported by ECU and itself the basis for further scientific investigation.

“This is real translational research,” says Associate Professor Galvão. “Here we have evidence-based outcomes being taken out of the laboratory environment and into the community, where we can analyse the experience in real life. With guidance from the ECU Health and Wellness Institute, the program will be run by qualified Exercise Physiologists across WA, and we hope that before long it will become available nationally.”

The Cancer Council offers a free program that can include meditation, yoga, and the Life Now Exercise regime. Participants will take two classes a week over a 12-week term, currently offered at centres in Beechboro, Inglewood, Mandurah, Nedlands and Riverton.

“With three terms a year and about 60-70 participants per term, we will rapidly build up a cohort of people with a wide range of cancers whom we can follow through and after their exercise courses, to track physical, functional and social wellbeing parameters. The body of data will be invaluable in determining further fields of study,” says Associate Professor Galvão.
CONTROLLED EXERCISE TREATING AN INCURABLE POST-CANCER CONDITION

Radical surgery and radiotherapy for breast cancer, traumatic as they are, are often just the beginning of problems experienced by female (and occasional male) sufferers. Some 20 to 30 percent of post-treatment patients go on to develop the lifelong, incurable condition of lymphoedema, characterised by swelling of the arm, physical and functional deterioration, psychosocial consequences and ongoing healthcare costs.

About 4,000 women in Australia develop lymphoedema each year. Because the condition has no cure, and survival rates for breast cancer continue to improve, this results in a growing population of sufferers. They often become emotionally dependent and socially reluctant, while those still prepared to emerge into the community will frequently wear uncomfortable compression garments.

“In the past, it was generally recommended to patients that they should avoid vigorous, repetitive or excessive movements of the affected limb, and either use the other arm for any load-bearing work or get assistance from their family,” says the Director of ECU’s Health and Wellness Institute, Associate Professor Daniel Galvão. “Research has taken us well past that point, and we now know that controlled exercise has positive outcomes for all cancer survivors. Additionally, recent research has confirmed that low-load resistance exercise carries little or no risk of initiating or worsening lymphoedema.”

Post-Doctoral Research Fellow at the ECU Health and Wellness Institute, Dr Prue Cormie, points to the likelihood of a downward spiral in physiological and psychosocial capability resulting from the development of lymphoedema if coupled with the current, conservative recommendations. “The unused muscles will atrophy just as if the limb were broken and in a cast,” she says. “This will further reduce physical capability and the condition will worsen. As well as pronounced deterioration in the ability to perform everyday activities, patients experience considerable pain and discomfort as well as struggling with finding clothing that fits or wearing jewelry on the affected arm.”

Exercise, and especially resistance exercise (i.e. lifting weights), is a potent stimulus to counteract the loss of muscle size and strength; but the question is, what is the optimal exercise prescription for the management of lymphoedema? ECU is at the forefront of this research and is working on a series of projects to explore the answers.

“We theorise that targeted resistance exercise will improve limb function and not worsen the swelling or severity of the symptoms,” Dr Cormie says. “There may also be a reduction in swelling as there is the potential that muscle contraction will help to pump accumulated fluid back to the arterial system in the same way that manual lymphatic drainage works.”

“Anecdotal evidence includes comments from the women that they can’t believe how much stronger they feel and how much more they can do,” says Professor Robert Newton, Head of the School of Exercise and Health Sciences. “We’ve seen a big shift in their self-perception and their psychosocial response to being confident in doing valued activities such as caring for grandchildren.”

Associate Professor Galvão says that the team is now beginning an examination of the use of compression garments during resistance exercise sessions, with funding through the Cancer Councils of WA and Queensland. The project will examine the response of patients to performing resistance exercise with or without a compression garment. Current recommendations are for patients to wear the garments as much as possible as they are theorised to aid the movement of lymph. However, patients often find the garments very uncomfortable to wear, especially during exercise. They often cause very painful sores and are a constant reminder of the condition.

The research program is already having a positive impact on the lives of the participants including Maureen Myatt, who says: “The program has improved my wellbeing tremendously. I couldn’t lift my arm up or carry shopping bags but now I’ve got a lot of my strength back, and when your body is stronger you feel better.” The research being conducted will provide important evidence-based information that will help shape clinical recommendations for this patient population.
Swallowing a heat sink might sound like an uncomfortable solution to an environmental problem, but in the north-west of Western Australia it has achieved immediate popularity following research by ECU into heat stress in the offshore petroleum industry.

“Working in hot, humid environments has many negative consequences,” says Associate Professor Jacques Oosthuizen. “We seem to be reasonably well adapted physiologically to hot dry conditions, but heat plus humidity is a real challenge to thermoregulation. Typically, manual workers in this sort of environment will experience loss of productivity, a higher incidence of accidents and injury and the serious risk of heat stroke.”

As Coordinator of the Occupational Health Research Group at the School of Exercise and Health Sciences, Associate Professor Oosthuizen has been building relationships with resources companies and industry groups, to facilitate research into occupational health problems that frequently arise from multiple physiological and environmental factors.

One such joint research project is with the North-West Shelf operator Woodside Petroleum, which wanted to ensure that conditions in WA’s offshore oil and gas industry were not creating risk for its employees.

Volunteer employees from the company’s King Bay supply base and the North Rankin A offshore platform agreed to provide data by being monitored through their shifts with devices such as telemetric pills and dermal patches. The pills, which are about the size and shape of a large vitamin capsule, were swallowed by participants and recorded body temperature during the 12 to 48 hour passage, transmitting it in real time to an external monitor. The dermal patches collected the same sort of information while attached to the skin.

“It’s quite a complex combination of factors,” says Associate Professor Oosthuizen. “We need to understand physiological parameters such as core temperature, the metabolic heat being generated by the work being done, the individual’s level of hydration and how acclimatised they are to the environment. Some of these fly-in fly-out employees travel from their homes in climates as cool as Albany or Tasmania, and it can take them some time to re-acclimatise to the north-west.

“Externally, we have to consider the ambient air temperature, humidity, air velocity, the sort of clothing being worn, and ambient heat sources such as machinery.”

Research was undertaken by post-doctoral research fellow Dr Joe Mate, who studied heat stress in underground mines in Canada for his PhD. One of his objectives is to develop and validate a heat stress index specifically for this industry in this environment, which would be a first in occupational health.

“We decided along the way to introduce and study an intervention mechanism,” says Associate Professor Oosthuizen. “Our choice was an ice slurry drink, popularly known as a slushie, which had previously been used in research at ECU on athletic performance. In essence, drinking a slushie introduces a small heat sink into the body.

“Researchers have had experience using ice slurry in these sorts of contexts in the past,” Dr Mate explains. “It had the desired effect of lowering heart rates and core body temperatures more rapidly and to a greater extent than cold water. While the effect only lasts for as long as it takes for the slushie to warm up to body temperature, it was sufficiently convincing for Woodside to install slushie machines at all its onshore and offshore production facilities.

“One of the unexpected results of our research was discovering that employees were sometimes coming on shift with less than optimal body hydration. They seemed not to be aware that they were dehydrated, so Woodside has installed refractometers, or urine hydration meters, so that employees will know if they are under-hydrated.”

Volunteer employees from the company’s King Bay supply base and the North Rankin A offshore platform agreed to provide data by being monitored through their shifts with devices such as telemetric pills and dermal patches. The pills, which are about the size and shape of a large vitamin capsule, were swallowed by participants and recorded body temperature during the 12 to 48 hour passage, transmitting it in real time to an external monitor. The dermal patches collected the same sort of information while attached to the skin.

“Externally, we have to consider the ambient air temperature, humidity, air velocity, the sort of clothing being worn, and ambient heat sources such as machinery.”

Research was undertaken by post-doctoral research fellow Dr Joe Mate, who studied heat stress in underground mines in Canada for his PhD. One of his objectives is to develop and validate a heat stress index specifically for this industry in this environment, which would be a first in occupational health.

“We decided along the way to introduce and study an intervention mechanism,” says Associate Professor Oosthuizen. “Our choice was an ice slurry drink, popularly known as a slushie, which had previously been used in research at ECU on athletic performance. In essence, drinking a slushie introduces a small heat sink into the body.

“Researchers have had experience using ice slurry in these sorts of contexts in the past,” Dr Mate explains. “It had the desired effect of lowering heart rates and core body temperatures more rapidly and to a greater extent than cold water. While the effect only lasts for as long as it takes for the slushie to warm up to body temperature, it was sufficiently convincing for Woodside to install slushie machines at all its onshore and offshore production facilities.

“One of the unexpected results of our research was discovering that employees were sometimes coming on shift with less than optimal body hydration. They seemed not to be aware that they were dehydrated, so Woodside has installed refractometers, or urine hydration meters, so that employees will know if they are under-hydrated.”

The research program is continuing, with further groups of volunteer participants at James Price Point and on the Northern Endeavour vessel. Measures will include blood sampling to identify heat shock proteins that might be predictors of heat stress. Eventually, the offshore petroleum industry in Australia’s north will have an evidence-based body of science from which it can develop a suite of practical steps to offset heat stress.

ECU’s recently-formed Occupational Health Research Group is a cooperative venture designed to bring together a broad range of parties with a mutual interest in the field. Prospective members apart from ECU include the WA Department of Mines and Petroleum, the WA Department of Health and companies operating in the mining, chemical and oil and gas industries, many of which have already signaled in-principle support.

“We aim to develop research protocols for the accurate determination of worker exposure profiles,” says the OHRG’s convenor, Associate Professor Jacques Oosthuizen. “Once we integrate environmental exposure levels with medical surveillance data, we expect to develop laboratory-based protocols to validate occupational exposure standards in the Australian context and the consequences of exposure to a mix of multiple agents.”

The research group has already started projects that include heat stress in the petroleum industry, development of an air sampling strategy in the iron ore industry, and environmental and occupational exposures in the gold mining industry (see following pages).

“Australia’s existing occupational health standards don’t reflect the multiplicity of exposures. They are generally based on exposure to one chemical, for example, which is not valid for workplaces where there are multiple chemicals or other factors,” Associate Professor Oosthuizen says.
An in vitro goldmine might sound like an alchemist’s dream, but the work being done at ECU’s Melanoma Research Group is designed to yield a rich reward of data rather than gold. In consequence, occupational health standards in the future might become site or industry specific and offer protection against a wide range of workplace risks.

Associate Professor Mel Ziman is leading a research project that will examine the way in which combinations of ultra-violet light, heat and chemicals affect the risk of employees in the gold mining industry, developing dangerous and often fatal melanomas. The research team is working with Newcrest Mining, which mines gold and copper at Telfer in the remote Western Australian outback.

“In a chance encounter with Newcrest’s Jenny Cahill at a Chamber of Minerals and Energy occupational health meeting, we started to talk about the role that heat might play in environmental damage to melanocytes, the melanin pigment-producing cells in the skin,” Associate Professor Ziman says. “Newcrest is one of the industry leaders in occupation health and safety, and it decided to fund a study with ECU.

“This is not an epidemiological study, though we have done an initial survey of a cohort of Newcrest employees, and in fact found that the incidence of skin cancer among them is well and truly in the normal range for young adult Australians. Rather, we want to investigate the cell morphology of early stage melanoma development by exposing human skin cells to a variety of occupational circumstances in the laboratory.”

The effect of UV light on melanocytes is well known and almost fully described. However, although heat is suspected to be a contributing factor, little work has been done on the consequences of working in a high-temperature zone. There is no doubt that Telfer qualifies – the mean maximum daily temperature exceeds 32°C for eight months of the year, and tops 40°C through December and January.

“Many employees are exposed to these temperatures and to UV light through their shifts, and while protective clothing and block-out cream are mandated, there are occasional lapses. It’s also significant that core body temperatures rise in this sort of working environment, and there is some evidence that the body’s repair mechanisms such as heat shock proteins become less effective.

“On top of that, employees in the gold mining industry must be protected against exposure to corrosive substances, irritants, sensitising agents, toxic substances and carcinogens. In our laboratory tests, we will expose the skin cells to various combinations of UV radiation, heat and two commonly used organic solvents.

“As far as we can ascertain, our findings will be a worldwide first in identifying whether combinations of known carcinogens and environmental factors can induce melanoma specifically.”

Field work has begun with post-doctoral research fellow Dr Joe Mate and Associate Professor Jacques Oosthuizen setting up a program to monitor actual exposures of the Telfer cohort to physical and chemical occupational stresses and, with collaborative support from Professor Robert Pearce at the Perth Melanoma Clinic, analysing the association between melanoma incidence and employee exposure.

“Melanoma is not only a highly aggressive cancer; it is notoriously resistant to current cancer therapies”

Laboratory protocols have been established by melanoma cell biology researchers at ECU, and the team hopes to have some initial results as early as October 2011.

“On a broader front, the identification of key environmental hazards and exposures will allow Occupational Health and Safety (OHS) measures to be introduced, to reduce the incidence of this disease at Telfer and other gold mining operations,” Associate Professor Ziman says. “Newcrest will be able to lead the way in implementing new and improved OHS standards, should any environmental factors be found to impact on melanoma incidence.

“This collaboration is expected to advance current OHS standards and knowledge of issues likely to affect skin safety. Ultimately, the research will identify novel genes involved in melanoma progression.”

An improved knowledge of OHS melanoma induction will substantially benefit clinicians and mining personnel as well as the WA community, where more than 1,000 new cases of melanoma are diagnosed each year. While Australia’s OHS practices are extremely stringent, insights into combinations of factors that can affect melanoma incidence are novel.

Evidence of changes in gene sequence and expression profiles after exposures to combinations of mining hazards, will provide much-needed information on cellular mechanisms of repair or failure to repair as a result of environmental stresses.
Progress is being made in developing a simple blood test to determine the presence and risk of circulating metastatic cells in post-surgical cutaneous malignant melanoma patients.

“With a three-year research program funded by the NHMRC, we are confident that we have five reliable prognostic blood markers,” says Professor Mel Ziman. “We are surprised that these marker cells appear to be present from early post-operative stages, and that there does not seem to be much quantitative change over time.

“Through isolating these marker cells from blood samples, we hope to determine if there is any difference between those from early stage patients compared with late stage patients. It may well be the cases that not all of them will undergo metastasis, or that the immune system is capable of identifying and removing some of them from the body.

“We expect to get to the stage where we can see the results of medical treatment through assessment of the suite of marker cells, and by that we can determine those treatments that are the most effective. Longer term, a person who has had treatment for melanoma could have an annual blood test to ensure that circulating cells remain at a safe level.”
Lifting weights is a time-honoured method of building muscle mass and strength, but modern research shows that we’ve probably got it the wrong way around. Lowering, rather than lifting, is increasingly recognised as the key to healthy muscles. In particular, it appears that these lowering, or eccentric exercises are vital to prevent or delay the onset of sarcopenia.

“Sarcopenia is a condition that particularly affects older people, when a decrease in muscle mass and strength is observed,” says Professor Ken Nosaka at ECU’s School of Exercise and Health Sciences. “Sarcopenia reduces quality of life by lessening mobility and it can result in impaired balance - which in turn can lead to injury from falls - and induce metabolic syndrome leading to diabetes, coronary heart disease and stroke.”

Professor Nosaka is researching the effects of eccentric exercise on muscle mass and strength. “This is the least known form of exercise,” he explains. “In isometric exercises the muscle contractions are static, in that there is no limb or joint movement. The familiar concentric form of exercise involves the muscle shortening under load, such as when lifting a weight. Eccentric exercise requires the muscle to lengthen under load, as some of the leg muscles do when you walk down a hill, or sit down in a chair.”

He warns that with sedentary lifestyles and professions, sarcopenia can begin to affect people in their forties. Today’s middle age will form the elderly cohort by 2050 when 23 per cent of Australians will be 65 or older.

“It’s a mistake to let gravity do the work when you sit down. If you sit down slowly, your muscles will get valuable eccentric exercise.”

“While it is well known from research that eccentric exercise helps to maintain overall muscle mass and strength, very little is known about the ideal type, intensity and duration of eccentric exercise programs, particularly for people who are already suffering from conditions such as diabetes or cardiovascular degeneration,” Professor Nosaka says. “Our current research is aimed at answering some of these questions.”

Rather than risk the unknown consequences of testing exercises on people with existing medical conditions, Professor Nosaka’s team plans to recruit participants who are obese but otherwise healthy. In fact, eccentric exercises are less demanding than isometric or concentric contractions, which demand more energy and produce less maximum force under load.

The ‘test bed’ will be a special eccentric exercise bicycle. Instead of exerting muscle strength to pedal forwards, the ‘cyclist’ will try to resist the power of an electric motor that is driving the pedals backwards. Specific muscles lengthen under this load rather than shorten, providing data that will inform outcomes.

The sophisticated static bicycle will record metrics for each participant, such as the force being exerted against each pedal in each revolution. In real time, an electronic screen shows the rider a graph of the energy being used and sets a target threshold based on predicted abilities.

“We believe this is a relatively safe form of exercise, even for people with medical conditions,” Professor Nosaka says. “Eccentric cycling requires only 14 to 30 per cent of the oxygen consumption for concentric cycling at the same workload. The heart rate is typically 34 per cent lower and cardiac output 39 per cent less at maximum cycling intensity compared with concentric cycling, with no increase in blood lactate.

“Despite this, eccentric cycling produces between four and seven times the workload of concentric cycling at the same intensity and the same oxygen consumption.”

With adequate funding, the study will be able to produce data that includes sampling for blood markers such as insulin sensitivity, and lipids such as cholesterol. MRI or CT scanning will demonstrate changes in muscle volume.

“Our participants will exercise three times a week over eight weeks in 20-minute sessions,” Professor Nosaka says. “We will have two groups of about 25 each, the first using the eccentric bicycle and the control group using a stationary concentric exercise bicycle.”

One of the challenges of the project will be to make some progress in the scientific understanding of delayed onset muscle soreness. DOMS is a characteristic of eccentric exercise, with onset typically following a day or two after the exercise, particularly if that exercise is new to the individual or hasn’t been performed for a considerable period.

“People exercising for the first time or after a prolonged period of inactivity may suffer from muscle damage, directly evidenced by large increases in muscle proteins in the blood, loss of muscle function, swelling and DOMS,” Professor Nosaka says. “We find that after successive periods of exercise the muscle damage markers attenuate through adaptation known as the repeated bout effect. However, there is the possibility that the initial responses will deter an individual from continuing with regular exercise so it is necessary to minimise DOMS for participants in the eccentric bicycle study.

“We have been conducting a series of studies to systematically investigate DOMS to find ways to alleviate pain and to provide insights into how to introduce exercise routines after periods of inactivity. One of our specific objectives in the study is to develop a new theory of connective tissue damage and inflammation that will give us a greater insight for future studies of DOMS and its consequences.”
Next time you enter a conference room for one of those three-hour management meetings, don’t be too surprised if you find all the chairs have been removed, and the table top is a metre above the floor.

More and more research is showing that sitting down for long periods is bad for us, with consequences ranging from deep vein thrombosis to an increased risk of bowel cancer.

Professor Ken Nosaka takes it a step further. He wants to find out if we might actually do our job better if we do it standing up.

“In one of our recent projects we measured comparative fatigue between the two modes of working,” he says. “Each participant performed both modes of work in a randomised order, both sitting down and standing up, for two six-hour periods. We assessed fatigue before, during and after sitting or standing for six hours using psychological and physiological parameters.

“We found that there was no difference in fatigue measures between the sitting and standing conditions.”

Professor Nosaka suspects that there might also be little or no difference in other factors, such as productivity or creativity. However, further studies are necessary to confirm it.

“It will be quite easy to get productivity measures,” he says. “Data entry operators, for example, already work with software that measures the speed and accuracy of keystrokes, so it would be simple to split a group into sitting and standing workers.

“So far as creativity is concerned, we have anecdotal evidence such as the ancient Greek philosophers who often undertook their analytical investigations while walking and talking with others in a group, rather than sitting around a conference table.

“Certainly we need to find ways to improve people’s health by getting them up off their chairs during work periods. It is quite clear now that even if you exercise before or after going to work, it does little to reduce the problems that can be attributed to sedentary workplace ergonomics.”
Alzheimer’s disease, the most common form of dementia among Australians 65 and older, is expected to triple its incidence by 2050 at huge cost to the community, to families and to individuals. It is a terminal illness, so far without cure or effective treatment. But there is clear evidence that its onset can be slowed or delayed by interventions designed to modify negative lifestyle behaviours and dietary habits. The potential payoff is huge - if the average onset of the disease could be delayed by five years, the number of people in our community with dementia would be halved.

Phytochemical compounds in fruit and vegetables elicit biological responses believed to improve brain health and vascular function. Recent studies investigating the role of various food components, including omega 3 fatty acids in fish, catechins in tea and curcumin in the spice turmeric, point to beneficial neurological health and function outcomes.
DIETS TO DEFY DEMENTIA: STAVING OFF DEMENTIA THROUGH HEALTHY EATING

Three servings of dementia a day is unlikely to top the list of popular diets. Unfortunately, analysis of the nutritional aspects of dementia shows that this is precisely what a significant proportion of the Australian population is consuming.

Diets to Defy Dementia is one program seeking to reverse this trend. “Our objective is to help people to understand the importance of diet and to actually put it on the plate,” says Associate Professor Amanda Devine. Dr Devine is Coordinator of the undergraduate nutrition program at ECU, and part of a team working to reduce the risk of dementia by changing dietary and food preparation habits.

“Our most recent program involved the Council on the Ageing, Nutrition Australia and the McCusker Alzheimer’s Research Foundation as well as ECU,” she says. “We set out to raise awareness in the community of the part diet plays in chronic disease risk factors, and then to give practical classes on how to prepare foods that would reduce those risks.”

The program began with education seminars that reviewed the outcomes of biomedical research and explained elements such as the role of antioxidants, food sources of resveratrol and omega 3, and also measured the self-assessed willingness of participants to change their dietary habits.

Of about 500 attendees at the seminars, 72 then enrolled in a program that combined nutritional education, activities and meal preparation. Participants attended four weekly sessions of three hours each and were able to enjoy the foods they prepared at the end of each session. Evaluation of the four-week program’s effectiveness on dietary behavior and nutritional knowledge was gathered.

“Clearly our cohort comprised of those who were in the second or third phases of change, ‘contemplation’ or ‘action’ - that is, those who were seeking the knowledge and skills to be able to make changes to their diets,” Dr Devine says. “We didn’t aim to recruit participants who were in the pre-contemplation phase, because they were not considering making changes to their diets and would have had little interest in attending the program. What we hoped was that the program would move interested participants from contemplation to action or from action to maintenance by giving them more ideas, knowledge and practical skills to implement changes to their everyday dietary habits and incorporate these into their regular lifestyle.”

Maintenance is the greatest challenge. Who hasn’t enthusiastically made New Year’s resolutions, only to see them quickly fade away? What casual snacker doesn’t know the difficulty of resisting temptation when faced with a pastry?

The program ran in Perth’s north metropolitan suburbs between October 2010 and April 2011, with changes in pre-course and post-course data showing very strong improvements in awareness, understanding and intention. The research results are in the process of being published, and funding is being sought for a similar program to be run for suburbs south of the river.

“We built many elements into the program to encourage maintenance by our participants,” Dr Devine says. “We ensured they understood the dietary factors involved in dementia, we showed them how to shop for particular foods without spending more than their normal budgets, we gave them recipes that could be prepared quickly and easily without sacrificing variety and tastiness, and we talked in groups about the course to encourage goal-setting and mutual support.”

“Dementia currently costs Australia’s health budget more than $10 billion a year.”

Follow-up research is being undertaken by Ruth Wallace for her ECU honours thesis, and will be completed by the end of October 2011. “We will collect both quantiative and qualitative data for analysis,” she says. “Questionnaires are being sent to 60 eligible participants to ask them about their current dietary habits, so we can compare the results with the data we collected post-program up to eight months ago. This will give us comparative outcomes, through which we can measure the degree to which changes have been incorporated in their day-to-day diets, determine how much knowledge they have retained and which dietary habits have been maintained.

“We will also run focus groups with some of the participants to recover qualitative evidence on what might have caused them to continue their new regime, what parts of the program were useful in helping them to maintain healthy diets, and why there have been changes in attitudes and practice.”

Most of the participants have been from an older age group, typically people who know or are related to someone who is suffering from chronic disease or dementia. This appears to be a trigger to move from the pre-contemplation stage and to at least begin to think about preventative practices.

“It also presents a greater challenge,” Dr Devine says. “By the time people reach later stages of life they often already suffer from physiological conditions that increase dementia risk, such as obesity, diabetes and cardiovascular disease.”

With dementia currently imposing a cost of more than $10 billion a year on Australia’s health budget, and estimated to increase to $14 billion in the next 20 years, the value of earlier intervention is clear.
Etiquette, a near-forgotten word encompassing the social rules to help people get along with each other, is emerging as the missing element in the virtual world of cyber space where young people go to build, maintain and destroy relationships.

In a world-first project, funded by Healthway, ECU’s Child Health Promotion Research Centre (CHPRC) is determining how secondary school students can learn to relate positively to each other in the digital world while being shielded from the risk of online dangers, particularly cyber bullying.

“Most people have little idea of the risks,” says Senior Research Fellow Kate Hadwen. “They are surprised to find the law is increasingly being applied in the digital world, across spectrum infringements from copyright to child pornography. They are amazed to discover children as young as 10 could blunder into activities that might expose them to criminal liability by inappropriately using the internet or a mobile phone.”

As project coordinator of the Cyber Friendly Schools Project, Ms Hadwen is keenly aware of the complex challenges children now face through easy access to the internet, mobile phones and other devices such as Wii, DS, Xbox, digital and video cameras.

“Bullying behaviour remains the core of the project, with both overt and covert bullying behaviours, including cyber bullying, being
addressed," she says. “Our research is aimed at demonstrating the best methods of teaching children to resist and overcome bullying and to reduce the incidence of all forms of bullying in schools. While there is a lot of material now available on cyber safety, there is little on cyber bullying and to our knowledge this is the world’s first empirical trial of resources developed specifically to reduce cyber bullying.”

Ground-breaking research led by the CHPRC’s Professor of Child and Adolescent Health, Professor Donna Cross, has driven the development of eight modules of work for Year 9 students who are part of a cohort of 4,500 across 40 Western Australian secondary schools. The modules are accessed from the Internet. The materials are comprehensive and dynamic, responding to feedback from teacher and student users.

The most recently developed module, ‘Reality Bites,’ introduces users to some of the legal aspects of digital activities, such as abusive text messages and “sexting” – the online sharing of sexually explicit materials. A video sequence dramatises the experience of a teenage student subject to a barrage of vitriolic texts and the consequences for the perpetrators. Drop-down menus explain relevant factors such as applicable laws, or the minimum frequency of bullying texts required to support a complaint.

“The demands of parenting are the same in the cyber world as they are in the real world.”

“As the architecture of the site and much of the content results from years of student feedback through the CHPRC’s innovative Student Reference Committee, and previous formative research funded by the Public Education Endowment Trust to build an understanding of cyber bullying,” Ms Hadwen says. “This is the way young people prefer to explore for information on the Internet, and the site responds to their need for engagement through its design elements.

“At the end of this year, we will be post-testing the student cohort that we have followed from Year 8 to Year 9 to determine the effectiveness of the intervention. We will know, for example, if students feel more able to handle bullying in the cyber world. Our measures will extend to reviewing changes in the school culture, such as school ethos and policies to address student behaviours.”

The results from this intervention will be compared with students in schools who received no intervention, to provide robust evidence of its effectiveness. Eventually, when the materials have been found to be effective, they will be packaged and released for sale to schools throughout the world, as was the case with the very successful primary school Friendly Schools and Families package. Funding generated from these sales contributes to further bullying-related research and post-doctoral positions in the CHPRC.

When the Internet’s popularity rapidly increased, parenting took on a new dimension – one that many parents were ill-equipped to handle. While their children acted like ducks with a new pond, most parents had little idea of the new challenge of cyber parenting and even less of how to meet it.

Then came the negatives. Cyber bullying, cyber stalking, young people making silly mistakes that they could never erase, and being hurt to the point of mental trauma. Suddenly, parents knew they needed help to support and safeguard their children in a digital age.

When the team at ECU’s Child Health Promotion Research Centre started to address the problem of cyber bullying, they soon realised that parents and teachers needed learning resources just as much as school children. With funding from the Telstra Foundation for the Cyber Friendly Families Project, an internet site was developed to help parents understand the complexities of cyber parenting.

“At the moment the Cyber Friendly Parents’ Intervention Trial platform is limited to password-enabled users," says Project Director Kate Hadwen. “We relied a lot on user feedback to improve the site through the project’s three years, and we hope it will assist parents to be more effective in cyber space.

“The demands of parenting are the same in the cyber world as they are in the physical world. You need to know where your children are, what they are doing, who they meet, what harm might come to them, and all without stifling their creativity, learning opportunities and fun. In the cyber world, just like the real world, it works best if you establish clear agreements with your children on what is permissible and what isn’t.”

The website fills in the gaps that differentiate the cyber world. Supports range from a model family agreement on how to use and share home computers, to setting up dual access to your child’s mobile phone.

“Children look to their parents for support in the cyber world as much as in the real world,” Ms Hadwen says. “Parents are better able to provide that support if they keep up with the technology. There will be arguments, just as there are in any other aspect of family relationships, but the outcome is worth the work.”

The CHPRC anticipates being able to release this website to the public in 2012 once the project has been completed.
It’s difficult to imagine a more global career. One employer has a devoted following of more than 450 million people. Coverage of its grand event every four years is equivalent to eight years of non-stop television. It is practiced in every country in the world, and is one of the fastest-growing industries in Asia.

It is, of course, football. More exactly, it is Association Football, often called soccer in Australia and America.

“The Beautiful Game” is deeply professional at its highest level and capable of supporting the most rigorous evidence and research-based training for all its key participants. Strangely, however, the science of football is not widely studied at tertiary level, with Liverpool John Moores University being one of the few institutions offering a fully-fledged BSc in Science and Football.

ECU intends to fill that void through a new undergraduate course at its School of Exercise and Health Sciences with a Bachelor of Science degree in Sports Science and Football, commencing in 2012.

“The basis is our existing, highly-regarded Bachelor of Science course in Sports Science,” says Dr Mike Newton, who initiated and helped to develop the course.

“It’s a full-time three-year on-campus course of 24 units, eight of which are specific to football. They include football sports medicine, leadership and management, advanced coaching strategies and skills, and football strength and conditioning. At the same time, undergraduates will cover broader fields such as anatomy, physiology, nutrition, sports biomechanics and exercise rehabilitation.

“It’s a demanding degree course, but at the end of it graduates will be fully versed in practical skills and theoretical knowledge. They will be immediately eligible for accreditation as coaches in WA, and we are working towards national and international accreditation of this course.

“Our course structure has been informed by the best research outcomes available worldwide, including those from our own School.”

The CEO of Football West, Mr Peter Hug, says the Association is pleased to give its complete endorsement and support to the ECU Football and Science program.

“The ability for students to combine their tertiary studies with their interest in football and graduate with a full degree can only be of great benefit to the sport overall, and I commend everyone involved at ECU for their initiative and enthusiasm to get the course to this stage,” he says.

“Football West is committed to working with ECU in developing our football practitioners of tomorrow, and we look forward to welcoming future graduates into the sport as we drive it towards improved professionalism for the benefit of everyone involved in the World Game.”

Dr Newton supports a widespread view that the world’s leading coaches in future will increasingly include those who have professionally qualified through tertiary studies, and who might never have played the game themselves at professional level.

The 2010 World Cup final between Spain and the Netherlands was watched by a record 24.3 million people in the US—a television audience greater than the population of Australia.

“Of course many top players are also capable of undertaking a university degree and might see this as a career option once their playing career starts to wind down,” he says. “But the world is moving away from any idea that good players are pre-qualified to become good coaches.”

Dr Newton expects initial undergraduate intakes to be sourced mainly from Australia, particularly WA, but he is excited about the prospect of growth based on a passion for football throughout Asia—particularly Singapore, Malaysia, Indonesia and Thailand, and potentially Japan, China and Korea. “They’re all passionate about football,” he says, “and many of these countries are already well aware of the proximity and professionalism of tertiary institutions in Perth.

“I believe that Asia’s population combined with its devotion to the game will eventually see it dominate as a financial contributor in the world of football, just as India has become pre- eminent in cricket.”

Inquiries from potential undergraduates are already coming in, largely as a result of word-of-mouth ahead of any substantial marketing. Dr Fadi Ma’ayah, a PhD in sports science and an FFA qualified and accredited coach who took both Safety Bay and Morley senior high schools through to State championships, has been recruited as course coordinator.
ECU’s Master of Exercise Science (Strength and Conditioning) has spun off a remarkable network of graduates who have found professional positions all over the world, leading to global interest in the course and enrolments from around the world.

“It was a bit unexpected, but we have had about 500 graduates since the degree was first offered and the word-of-mouth endorsement they give us is more powerful than any other form of marketing,” says course coordinator Dr Mike Newton.

“It’s highly sought after for a number of reasons, one of which is that it’s available fully online apart from a two-week practicum in second semester. This means that participants can study from anywhere in the world, and they do. They also highly value the networking opportunity of the practicum which is held on-campus at Joondalup.

“With about 140 students enrolled at any one time, we are probably close to the limit of a single practicum and might have to start running two each year.”

The 18-month coursework degree runs for three full-time semesters and is also available part-time. Students must have already completed a bachelor degree in sports science, human movement, physical education or a similar discipline.

“I’m confident in saying it’s one of the best in the world - if not the best - in strength and conditioning,” Dr Newton says. “We’ve attracted people from most of the professional clubs in Australia including Melbourne Storm, North Queensland Fury, Western Bulldogs and the Melbourne Demons. We’ve also had students from Singapore Sports School, English Institute of Sport, Fulham Football Club, Blackburn Rovers and even the Turkish league club Galatasaray.”
All of us, health professionals included, make assumptions based on our beliefs and expectations. Sometimes these assumptions are wrong and we have to ‘unlearn’ those ways of thinking. For example, a common mistake is to immediately assume that an Aboriginal person lying on the footpath is drunk.

A paramedic who has been trained at an institution which challenges these assumptions, and provides insight into Indigenous health issues through experiences that have been embedded in the curriculum, will be more likely to make a different initial assumption.

“The paramedic will know that compared with the rest of the population, less Indigenous Australians drink alcohol and that Indigenous people are more likely to suffer from diabetes, heart disease, cancers and many other diseases which may be the underlying cause of the problem,” says Associate Professor Moira Sim. “Numerous surveys have shown that more Indigenous Australians have not consumed alcohol in the past 12 months than is the case with white Australians. The 2007 National Drug Strategy Household Survey found 23.4 per cent of Indigenous Australians abstained from drinking alcohol, compared with 16.8 per cent of other Australians.” Indigenous Australians are also less likely to access healthcare in the early stages of chronic diseases such as diabetes.

With curricula attuned to, and drawing lessons from, real-life Indigenous experience informed by research, the inter-relationships between patients and service providers can only improve.

“As Australians we have a duty to contribute to closing the gap in health between Indigenous and non-Indigenous Australians,” Associate Professor Sim says.
Many Australians have experienced the sensation of landing in a foreign country where English is rarely spoken, customs and practices are vastly different and you just don’t feel welcome. Despite the attractions of tourism, it’s a relief to get back home to your own culture.

Some Australians don’t have to go overseas to experience that feeling. Strangely, in a multicultural country that prides itself on equal opportunity and a fair go, our own Indigenous Australians often find the world of tertiary education a strange, difficult and unwelcoming environment. As a result, a significant number drop out and “go home.”

Associate Professor Moira Sim, ECU’s Head of School for Medical Sciences, has a mission to turn that around.

“About five years ago a group of us at the Systems and Intervention Research Centre for Health (SIRCH) became concerned about the small number of Indigenous Australians who were taking undergraduate courses in the health sciences,” she says. “We sought advice from Professor Colleen Hayward at Kurongkurl Katitjin, ECU’s Centre for Indigenous Australian Education and Research.

“Several projects grew out of that small beginning. The Hot ‘n’ Deadly program brings young Indigenous people from Years 9 to 12 to ECU for four days to introduce them to the campus and give them the flavour of a career in nursing and paramedicine.

“To ensure that Indigenous undergraduates will experience a welcoming and supportive learning environment, however, we found that we had to change the perspective of staff and, to some extent, their fellow undergraduates.

Associate Professor Sim says that among teaching staff there was some questioning as to why Indigenous students had to be treated differently from other undergraduates, many of whom were themselves from diverse social and ethnic backgrounds and who also often faced significant challenges in joining the university community.

“Before long it became clear that we had an equally important mission in ensuring that our graduates were trained to understand the health needs of Indigenous Australians and to deal with these in an empathetic manner,” she says. “By embedding this understanding in the teaching curriculum, and engaging staff and students with authentic stories of Indigenous people’s experience of healthcare, we hope to enhance the development of a deep and lasting empathy.”

The median age of death among Indigenous Australians is 53 years. For the rest of the Australian population it is 78.

This was the genesis of the Creating Cultural Empathy and Challenging Attitudes through Indigenous Narratives project. It soon became clear that the project had implications far beyond ECU and would be best undertaken by a consortium of partners. Led by ECU (Ms Toni Wain, Associate Professor Moira Sim, Professor Colleen Hayward and Professor Cobie Rudd), it now includes The Combined Universities Centre for Rural Health, Curtin University of Technology, The University of Notre Dame, The University of Western Australia and the Health Consumers’ Council (WA), with funding support from the Australian Learning and Teaching Council.

“We are currently in the process of collecting 50 stories, both positive and negative, of the experiences of Indigenous Western Australians in their encounters with health services,” says Associate Professor Sim.

“Stories are being collected on video, which will be edited and put onto a website as video or text as a library from which a national network of educators can develop, trial and share learning resources.

“One of the exciting aspects of the project is that a film will be scripted from elements drawn from the 50 narratives. The script will be written by David Milroy, a Palyku man from the Pilbara region who has achieved international recognition as a musician, playwright, writer and theatre director. He won the Patrick White Playwright’s Award in 2004 for Windmill Baby.

“The narratives are very personal and very powerful statements of Indigenous experience,” Associate Professor Sim says. “In each case we are asking the narrator to express, in their own words, what they think the moral of their story is. What particular points would they like health professionals to understand and respond to?

“Through our national network of health educators we have high expectations of being able to contribute to the national priority of closing the gap between the health outcomes of Indigenous and non-Indigenous people. Challenging existing attitudes, and developing empathy towards Indigenous people, students and communities among future health graduates, will take us some distance towards that goal.”

Under the current schedule, the narratives will be available on the website towards the end of 2011 and learning and teaching materials will be produced early in 2012, when pilot trials will begin.

* The Australian Learning and Teaching Council Ltd is an initiative of the Australian Government Department of Education, Employment and Workplace Relations. The views expressed in this article do not necessarily reflect the views of the Australian Learning and Teaching Council.*
PROFESSOR COBIE RUDD
Pro-Vice-Chancellor (Health Advancement)
Phone: 08 6304 2422
Email: cobie.rudd@ecu.edu.au
Research interests: Health policy and system development, learning through simulation in health, mental health, interprofessional learning

ASSOCIATE PROFESSOR KATE ANDRE
School of Nursing and Midwifery
Phone: 08 6304 3476
Email: k.andre@ecu.edu.au
Research interests: Work-integrated learning and performance assessment, curriculum innovation and enhanced professional performance of graduates, strategies to support disadvantaged student groups

PROFESSOR DONNA CROSS
Professor Child and Adolescent Health
Phone: 08 9370 6634
Email: d.cross@ecu.edu.au
Research interests: Children and adolescents’—bullying and aggression prevention, mental health promotion, smoking cessation, road safety, healthy eating and physical activity

ASSOCIATE PROFESSOR DANIEL A. GALVÃO
Director, Edith Cowan University Health and Wellness Institute
Phone: 08 6304 3420
Email: d.galvao@ecu.edu.au
Research interests: Exercise in prevention and management of cancer, androgen deprivation therapy for prostate cancer, ageing, exercise and the musculoskeletal system

PROFESSOR LYNNIE COHEN
Associate Dean, Teaching & Learning, Faculty of Computing, Health & Science
Phone: 08 6304 3446
Email: l.cohen@ecu.edu.au
Research interests: Established the Lifespan Resilience Research Group which focuses on mental health, also offering clinical services to families and individuals affected by mental illness

PROFESSOR CRAIG SPEELMAN
Head of School of Psychology and Social Sciences
Phone: 08 6304 5724
Email: c.speelman@ecu.edu.au
Research interests: Cognitive psychology, skill acquisition, financial decision making, memory for music

DR PRUE CORMIE
Edith Cowan University Health and Wellness Institute
Phone: 08 6304 3418
Email: p.cormie@ecu.edu.au
Research interests: The role of exercise in the management of cancer, the role of exercise in maintaining and improving health, neuromuscular adaptations to resistance exercise.

PROFESSOR ALFRED ALLAN
Professor of Psychology
Phone: 08 6304 5536
Email: a.allan@ecu.edu.au
Research interests: Apology, forgiving and reconciliation, specifically with reference to human rights abuse, crime and adverse incidents in health, professional practice, law and ethics of mental health

PROFESSOR ANNE M. WILKINSON
WA Cancer Council Chair in Palliative and Supportive Care
Phone: 08 6403 3540
Email: anne.wilkinson@ecu.edu.au
Research interests: Palliative care, quality of life at the end of life, quality of care at the end of life, advanced chronic illness, care-giving

DR MEGHAN THOMAS
Parkinson’s Centre (ParkC) Coordinator and Postdoctoral Research Fellow
Phone: 08 6304 3560
Email: m.thomas@ecu.edu.au
Research interests: Parkinson’s disease, developmental genetics, transcription factors, cell replacement therapies

PROFESSOR PIERRE HORWITZ
Associate Professor, Consortium for Health and Ecology
Phone: 08 6304 5558
Email: p.horwitz@ecu.edu.au
Research interests: Ecosystem condition, human health and well-being, water, ecology and health, healthy settings and systems thinking
Research interests: Investigating the nutritional aspects for optimising bone health, determining the role of fruit and vegetables in chronic disease management, implementing community-based cooking programs.

PROFESSOR RALPH MARTINS
Foundation Professor Ageing and Alzheimer’s Disease
Phone: 08 9347 4200
Email: r.martins@ecu.edu.au

Research interests: Development of diagnostic tests, drug development and evaluation, lifestyle intervention trials.

PROFESSOR CAROLINE TAYLOR
Foundation Chair in Social Justice
Phone: 08 6304 5549
Email: c.taylor@ecu.edu.au


PROFESSOR ELIZABETH ARMSTRONG
Foundation Chair in Speech Pathology
Phone: (08) 6304 5101
Email: b.armstrong@ecu.edu.au

Research interests: Communication disorders after stroke, language impairment after stroke, social models of disability, social outcomes of communication disorder, the discourse of clinical interactions.

ASSOCIATE PROFESSOR MOIRA SIM
Head of School of Medical Sciences and Principal Systems and Interventions Research Centre for Health (SIRCH)
Phone: 08 6304 3504
Email: m.sim@ecu.edu.au


ASSOCIATE PROFESSOR AMANDA DEVINE
School of Exercise and Health Sciences
Phone: 08 6304 5527
Email: a.devine@ecu.edu.au

Research interests: Investigating the nutritional aspects for optimising bone health, determining the role of fruit and vegetables in chronic disease management, implementing community-based cooking programs.

ASSOCIATE PROFESSOR AMANDA DEVINE
School of Exercise and Health Sciences
Phone: 08 6304 2596
Email: f.maayah@ecu.edu.au

Research interests: Leadership in sport, football-related research, impact of sport on young students education and health.

ASSOCIATE PROFESSOR ANNE WILLIAMS
Associate Professor for Clinical Research and Innovation
Phone: 08 6304 3544
Email: a.williams@ecu.edu.au

Research interests: Physical and emotional comfort of patients, pain management, nursing in the acute care hospital setting, use of complementary therapies, qualitative and action research methods, instrument development.

ASSOCIATE PROFESSOR RICHARD BRIGHTWELL
Coordinator, Paramedical Science Programs
Phone: 08 6304 3475
Email: r.brightwell@ecu.edu.au

Research interests: Prehospital education, simulation, prehospital clinical practice, prehospital emergency and disaster management.

ASSOCIATE PROFESSOR ANNE WILLIAMS
Associate Professor for Clinical Research and Innovation
Phone: 08 6304 3544
Email: a.williams@ecu.edu.au

Research interests: Physical and emotional comfort of patients, pain management, nursing in the acute care hospital setting, use of complementary therapies, qualitative and action research methods, instrument development.

ASSOCIATE PROFESSOR RICHARD BRIGHTWELL
Coordinator, Paramedical Science Programs
Phone: 08 6304 3475
Email: r.brightwell@ecu.edu.au

Research interests: Prehospital education, simulation, prehospital clinical practice, prehospital emergency and disaster management.

ASSOCIATE PROFESSOR ANNE WILLIAMS
Associate Professor for Clinical Research and Innovation
Phone: 08 6304 3544
Email: a.williams@ecu.edu.au

Research interests: Physical and emotional comfort of patients, pain management, nursing in the acute care hospital setting, use of complementary therapies, qualitative and action research methods, instrument development.
GREENING ECU

Edith Cowan University is committed to reducing the environmental impact associated with its operations by conducting its activities in a socially and environmentally responsible manner. This includes implementing strategies and technologies that minimise waste of resources and demonstrate environmentally sensitive development, innovation and continuous improvement.

Contact ECU by phone on 134 ECU (134 328)
For calls outside Australia phone (61 8) 6304 0000
Email us at enquiries@ecu.edu.au
Visit www.ecu.edu.au