School of Public Health and Preventive Medicine (SPHPM) Honours Projects Booklet

Introduction

This booklet is intended to provide an overview of the research activities within the School of Public Health and Preventive Medicine (SPHPM) and to give you an indication of the Honours projects that will be offered in 2013. All Honours students must discuss prospective projects with a number of supervisors (at least three) before choosing their preferred project. Please note that the project descriptions are quite short, and more comprehensive details can be obtained when speaking to supervisors.

Our Honours program offers a career path into many areas of public health and clinical research. The School run three Honours Streams.

- The Bachelor of Medical Science (BMedSc) [http://www.med.monash.edu.au/bmedsci/];
- The Bachelor of Biomedical Science (BBiomedSc) [http://www.med.monash.edu.au/biomed/honours/]; and
- The Bachelor of Health Science [http://www.monash.edu.au/study/coursefinder/course/3971/]

More information about the individual programs can be found on the websites.

Honours Coordinators for the individual steams are:

- Bachelor of Medical Science (BMedSc) and Bachelor of Biomedical Science (BBioMedSc): Associate Professor Allen Cheng (Room 5.328, Level 5, Alfred Centre, Commercial Road, Prahran, 990 30259, allen.cheng@monash.edu; and Dr Jay Illesinghe (Room 5.327, Level 5, Alfred Centre, Commercial Road, Jayamini.illesinghe@monash.edu, Prahran, 9903029); and
- Bachelor of Health Science: Dr Charles Livingstone, (Level 3, Burnet Building, Commercial Road Prahran, Charles.Livingstone@monash.edu, 990 31679).

We look forward to seeing you in the Honours Course next year. For any further queries please don’t hesitate to contact us.

Associate Professor Allen Cheng & Dr Jay Illesinghe
Overview of the School

The Monash University School of Public Health and Preventive Medicine (SPHPM) was established in 2008 and it is the second largest School within the Faculty of Medicine, with more than 800 full-time equivalent academic, research and professional staff. The School, a partnership between Monash University, Alfred Health, Baker Institute and Burnet Institute, is located on one site at the Alfred Monash Research and Education Precinct.

The School is well known nationally and internationally for providing leadership in understanding, advancement, and education and in the practical application of the discipline of public health issues and practices thereby improving the health outcomes for the Australian community. The School’s expertise lies in epidemiology (including clinical epidemiology), biostatistics and large-scale clinical data-management and health services research and is active in many multidisciplinary research areas. The School initiates and manage both large and small epidemiological studies, including multicentre clinical trials, clinical registries and cohort studies.

Our research addresses several of the principal agendas of health care, including:

- preventing chronic disease and health promotion;
- increasing the evidence-base of healthcare;
- improving quality and safety of healthcare;
- advancing health information technology;
- improving cost-effectiveness;
- improving translation of biomedical research into clinical and public health practice;
- prolonging disability-free survival among the elderly;
- improving the care of the critically ill and injured;
- reducing adverse health impacts of the environment and the workplace; and
- improving global health.

We work closely with the major Monash affiliated hospitals, research institutes and public health units within Victoria.
**ASPREE**

**Prof John McNeil**
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Prof John McNeil is the Head of the School of Public Health and Preventive Medicine. His research background is in epidemiology & clinical pharmacology and is the Chief Investigator in the ASPirin in Reducing Events in the Elderly (ASPREE) trial. ASPREE is an international multicentre primary prevention clinical trial aimed at assessing whether daily treatment of aspirin prolongs healthy lifespan through the prevention of heart attack, stroke, cognitive decline, physical decline and some cancers such as bowel cancer.

**Dr Alice Owen**
Tel: 9903 0045, Email: Alice.Owen@monash.edu

Dr Alice Owen is a Senior Research Fellow in the Centre of Cardiovascular Research and Education in Therapeutics (CCRE) and a senior investigator of the ASPREE Longitudinal Study of Older Persons (ALSOP), a sub-study of the ASPREE clinical trial of aspirin. Her areas of research interest include the cardiovascular effects of long chain omega-3 fats, epidemiological modelling and community strategies for blood pressure control.

**The ASPREE Longitudinal Study of Older Persons (ALSOP)**

ALSOP is a sub-study of a large-scale clinical trial of aspirin (the ASPREE Study) which is being conducted by the School of Public Health and Preventive Medicine. ALSOP has enrolled more than 6000 people aged over 70y who are participating in the ASPREE trial, and is undertaking a series of survey-based evaluations of social, medical, lifestyle and environmental factors which influence Healthy Ageing in this large group of older Australians.
Like many societies around the world, Australia is faced with an ageing population. It is universally acknowledged that finding ways to ensure that these extra years of life are healthy and productive is vital to a sustainable future. There is still much we do not know about the causes and progression of chronic disease associated with older age, and what factors support or impede healthy ageing.

Longitudinal studies such as ALSOP are at the forefront of multi-disciplinary research into ageing. The linkage with the ASPREE clinical trial means that ALSOP is uniquely placed to examine a wide variety of factors that have the potential to influence healthy ageing in older Australians, and will also be able to link these with validated disease and health outcomes collected through the clinical trial.

Professor Robert Burton
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Professor Burton’s main research interests are the cellular immunology of cancer and transplantation, and the epidemiology and behavioral science of the control of chronic non-communicable diseases (NCD), in particular cancer control planning, prevention and screening. He has published more than 200 scientific papers, book chapters and books in these areas.

Screening for cancer in Australia: breast, prostate, cervix, skin
(Professor Robert Burton Professor Robin Bell and Ms Basia Diug)

Objective To estimate the balance of benefits and harms in the national biennial mammographic screening program (BreastScreen) targeting women aged 50–69 years, which was established by the Australian Government in 1991, and the opportunistic Prostate Specific Antigen (PSA)-based prostate cancer screening which began about 1990.

Design A comparative study between BreastScreen participation and breast cancer age-specific incidence and mortality trends between 1991–1992 and 2005–2006 has been undertaken for women aged between 40–49 years, 50–59 years, 60–69 years and 70–79 years. Women aged 40–49 years and 70–79 years, who were not targeted by BreastScreen, but who had access to the program, were compared to the targeted women aged 50–69 years.

Early detection of cancer: Harms and benefits of screening

There are only two population-based strategies that can reduce mortality from cancer. The first is a cancer prevention program, which reduces the incidence of a fatal cancer, and the second is an early detection program for cancers that are more curable if they are diagnosed earlier. Early detection can be achieved by two strategies. The first is population and health care professional education. This leads patients with early symptoms of a cancer, which is curable if diagnosed and treated competently, to present to a health care system that can competently manage them. The second is to use a test that can diagnose pre-cancers and early cancers in asymptomatic people. The successful design and implementation of a population-based early detection program which reduces the cancer specific mortality from the cancer(s) targeted by the program is one of the most difficult cancer control actions a healthcare system can accomplish. It is important to note that of the ten most common cancers in the world in 2000, seven have higher survival and reduced mortality rates
if detected early. Randomised controlled screening trials (RCST) have shown that the screened population has a significantly reduced mortality when compared to the control population for six of these (breast, colorectal, cervix, oral, lung and liver).

Screening asymptomatic populations for early and pre-cancers carries additional ethical responsibilities to those involved in diagnosing cancer in patients presenting with symptoms. Screening exposes normal people to the harms of false positive tests and over-diagnosis of diseases that would not have come to notice in the patient’s lifetime. If screening is ineffective, it can cause populations more harm than good, although some individuals may benefit. This is particularly likely to occur with opportunistic screening and case finding for cancer on a person by person basis. Therefore, this approach has been replaced for some cancers by organised population-based mass screening programs. The population-based mass screening programs require the healthcare systems described above and the benefits in mortality reduction have to be carefully weighed against both the harms from false positive tests and over-diagnosis of cancers that do not have fatal potential. Over-diagnosis is an inevitable outcome of cancer screening and is very apparent with PSA screening for prostate cancer. This was obvious in the successful European RCST. It can also become a major problem as cancer treatment improves while the sensitivity of the cancer screening test does not.

This is currently the problem facing mammographic screening for cancer. The efficacy of this method was shown in RCST initiated in the 1970s and 1980s, where the vast majority of all patients diagnosed were treated without the benefit of modern adjuvant hormonal and chemotherapy. The subsequent implementation of mammographic screening into healthcare systems in developed countries in the 1990s, after effective adjuvant hormonal and chemotherapy became widely used for breast cancer treatment, has resulted in population-based breast cancer incidence and mortality studies which have shown that screening mammography had little or no effect on breast cancer mortality in some countries. As the treatment of a disease improves the advantages of earlier detection through screening may disappear.
Understanding the gender-specific health needs of women with complex chronic disease

There is a need to better understand the psychological and physical needs of women with haemopoietic stem cell, heart, lung or heart-lung transplants, and those with severe mental illness. Very little is known about the reproductive characteristics of these women (including menopausal characteristics) and the clinicians, who are looking after them are very keen for this work to be done. This research will be undertaken in close collaboration with a PhD student within the Women’s Health Research Program in the School of Public Health at the Alfred.

It will involve the use of validated questionnaires to determine the wellbeing, menopausal symptoms, sexual dysfunction, depression, infertility concerns, bone health, screening for gynaecological cancer and breast cancer for which these women are at increased risk, and in women with stem cell transplantation, genital graft versus host disease. Results will be compared to Australian normative data provided by a survey of healthy women being conducted by the department. The outcomes of this research will be used to develop care plans that will be implemented in specialised clinics, initially at the Alfred Hospital in Melbourne, and after review, made available for implementation at other specialised centres.

Health and Wellbeing After Breast Cancer

The BUPA Health Foundation Health and Wellbeing After Breast Cancer, is a 5 year prospective cohort study of over 1600 Victorian women with their first diagnosis of invasive breast cancer. The focus of the study is on the physical, psychological and social aspects of the impact on women of the diagnosis and treatment of breast cancer. The data collection for this study is now complete and we are working through a series of analyses. We have published 14 papers from this study to date covering issues such as self-reported wellbeing, use of alternative therapies, adherence to endocrine therapy and many others.
therapies and use of imaging in health surveillance. There are several areas of this study which are still to be explored. We are able to offer honors projects within this study to students interested in exploring aspects of the experience of Victorian women with breast cancer.
Clinical Epidemiology
CCRE Therapeutics

Prof Henry Krum
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All projects offered by the Centre for Cardiovascular Research Unit (CCRE) will be overseen by Prof Krum

Professor Henry Krum is a physician at Melbourne’s Alfred Hospital and is the director of Monash University’s Centre of Cardiovascular Research and Education in Therapeutics. He focuses on drug treatment and therapies for cardiovascular disorders such as high blood pressure and heart failure. He has been involved in developing a renowned surgical keyhole procedure that ‘cuts’ the nerves using radio waves, providing hope for the 5 to 20 per cent of those with ‘drug resistant’ hypertension.

A/Prof Bing Wang
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A/Prof Bing Wang works within the Centre of Cardiovascular Research and Education in Therapeutics (CCRE). His research interest lie in cardiovascular pharmacology, drug discovery and development, and cardiorenal syndrome research. Dr Wang has expertise in molecular and cellular biology, biomarkers and protein biochemistry, drug design and development, natural products chemistry and pharmacology, especially in signaling mechanisms of inflammatory cytokines and mediators/biomarkers in cardiovascular and renal diseases including heart failure and chronic kidney diseases.

Evaluating mediators of cardiac remodelling in heart failure (in vitro)

The pathophysiological progression to heart failure is a complex process. Initial insults such a myocardial infarction or chronic hypertension, trigger the activation of neurohormonal systems in the body in an attempt to restore cardiac function. However, long-term activation of this system
becomes maladaptive by causing cellular and molecular changes in the heart which leads to cardiac remodelling. In addition to neurohormonal activation, inflammatory markers such as TNFα, TGFβ, IL-6, IL-1β are also increased in response to local tissue injury due to macrophage infiltration. Furthermore there is evidence that both neurohormonal and inflammatory mediators activate reactive oxygen species (ROS) which contribute to this cycle of maladaptive remodelling. In order to understand these complex pathways this research project will utilise cardiac myocytes, fibroblasts and THP-1 cells to examine the relationships between various mediators such as TNFα, TGFβ, IL-6, IL-1β, angiotensin-II and examine effects on markers of collagen synthesis, myocyte hypertrophy, as well as effects gene expression of inflammatory markers and the role of ROS. By using tool compounds to inhibit specific pathways involved in cardiac remodelling, we will identify potential novel treatments that may lead to preclinical studies. From this project the candidate will acquire skills and experience in aseptic cell culture technique, the ability to perform numerous cell based assays, RNA extractions and real time PCR, Western blot analysis, and chemiluminescence assays for measuring ROS.

Novel Anti-inflammatory Compounds Development

Chronic inflammatory disorders such as rheumatoid arthritis and chronic heart failure (CHF) are major health conditions that exact an enormous toll on human health. Current therapies are inadequate in the treatment of various inflammatory disorders with many agents causing significant side effects. Hence, development of new drugs for chronic inflammation is of particular importance.

Among the diverse signalling networks involved in inflammation, an enzyme, p38 mitogen activated protein kinase, has emerged as a critical convergent point that clearly warrants pursuit as a drug target in chronic inflammation. We have now developed a number of these potent anti-inflammatory compounds, many of which possess anti-fibrotic activity, an additional beneficial consequence in the treatment of CHF and other chronic disorders. Selected compounds will be studied in vivo with animal CHF models where cardiac functional activity and degree of inflammation will be measured.

This Project will determine selectivity and bioactivity of lead compounds using various enzyme and cell based assays. Preclinical studies using animal models of RA and CHF will be performed to determine efficacy of our novel compounds and drug candidates.

The candidate will acquire skills and experience in enzyme, cell based assay techniques and in vivo study as well as real time PCR and Western blot analysis.

This project would ideally suit an Honours candidate looking to go on to a PhD. Aspects of the above study can be limited to a distinct Honours project.

Dr Andrew Kompa

Tel: 990 30664 Email: Andrew.Kompa@monash.edu

Dr Kompa is a Research Fellow in the CCRE Unit. His interests lie in studying the processes involved in cardiac remodeling using in vivo and in vitro models of cardiac disease, with particular interests in developing clinically relevant agents for the treatment of heart failure.
Investigation of novel therapies for the treatment of cardiac and/or renal disease (in vivo)

A close relationship between chronic kidney disease (CKD) and chronic heart failure (CHF) has been demonstrated both clinically and using basic research methodologies. The relationship of these two entities is bi-directional with regard to physical, chemical and biological mechanisms. CKD is an important contributor to cardiovascular mortality, which in turn is responsible for 40-50% of all deaths. Acceleration of coronary artery disease and left ventricular hypertrophy are major cardiac problems observed in CKD patients and may be contributory to the CHF that is a frequently accompaniment. In addition to individual animal models of CHF and CKD, we have characterised a novel model of cardio-renal syndrome that accelerates the decline in cardiac function. By targeting specific pathways identified from our in vitro program, preclinical evaluation of tool compounds will be performed to determine outcomes on cardiac and renal function as well as examining pathological, molecular and biochemical changes.

From this project, the candidate will acquire skills and experience in the establishment of an animal model, preclinical study design, measurement of cardiac and renal function (ie. echocardiography, haemodynamic, GFR measurements), histology and immunohistochemistry, real time PCR and Western blot analysis. This project would ideally suit an Honours candidate looking to go on to a PhD. Aspects of the above study can be limited to a distinct Honours project.
Musculoskeletal Epidemiology

Prof Flavia Cicuttini
Tel: 9903 0555 Email: flavia.cicuttini@monash.edu

All projects offered by the Musculoskeletal Epidemiology Unit will be overseen by Prof Cicuttini

Prof Flavia Cicuttini is the Head of the Musculoskeletal Epidemiology Unit. Her current research includes using Magnetic Resonance Imaging to understand factors that affect joint cartilage in healthy and diseased states.

Dr Yuanyuan Wang
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Dr Wang works as a research fellow in the Musculoskeletal Epidemiology Unit. Her research interests lie in the factors affecting knee and hip structure and the effect of sociodemographic and lifestyle factors on the risk of primary and revision joint replacement.

The effect of body composition and physical activity on hip structure in a community-based population without clinical hip osteoarthritis

Hip osteoarthritis (OA) is a major cause of pain and disability with no treatment that affects progression of disease. The prevalence of hip OA is expected to increase given the ageing of the population and the current obesity epidemic. To date, most research has focused on treating the resulting pain and disability. In order to reduce the burden of OA, identifying modifiable risk factors

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in the normal population, which have implications for the prevention of hip OA, is important. How obesity and physical activity affect the risk of hip OA has not been well understood.

This study aims to examine the associations between body composition (muscle mass and fat mass) and physical activity over 15 years with hip structure assessed using magnetic resonance imaging (MRI), in order to identify strategies to protect the hip joint and prevent the onset of hip OA.

This study was a cross-sectional study. 214 asymptomatic participants, with no significant trauma or known arthritis, were recruited from the Melbourne Collaborative Cohort Study. Weight, body mass index, body composition, and physical activity were measured in 1990-4, 1995-8 and 2003-5. Each participant underwent a hip MRI during 2009-2010. Weight, physical activity, and occupational history were obtained at the time of hip MRI. Hip cartilage volume, hip bone shape and the presence of bone marrow lesions were assessed from MRI using validated methods. Analyses of hip structure associated with body composition and physical activity will be performed using linear/logistic regression, adjusting for confounders.

The role of lifestyle factors on knee structure in a community-based population: a longitudinal study

Knee osteoarthritis (OA) is a major cause of pain and disability and accounts for approximately 90% of knee replacements. The prevalence of knee OA is expected to increase given the ageing and obesity epidemic of the population. To date, most research has focused on treating the resulting pain and disability. However, in order to reduce the burden of OA, identifying modifiable risk factors in the normal population is important.

This study aims to identify lifestyle factors (diet, physical activity and body composition) that affect knee cartilage and bone in asymptomatic subjects without clinical knee OA, thereby identifying potential targets for the prevention of knee OA. This will be done by utilizing an existing cohort, the Melbourne Collaborative Cohort Study (MCCS), with over 15 years of prospectively collected risk factor data, and recently developed methodology for measuring articular cartilage volume that our group has pioneered.

This study was a longitudinal cohort study over 2 years. 297 asymptomatic participants, with no significant trauma or known arthritis, were recruited from the MCCS. There was 15 year of prospectively collected data already available as part of the MCCS regarding detailed dietary intake, weight, body mass index, body composition, and physical activity. Each participant underwent a knee magnetic resonance imaging (MRI) during 2003-2004 and 2 years later. Physical dysfunction (the Western Ontario and McMaster Universities Osteoarthritis Index), physical activity, body composition, and past and current occupational history were collected at the time of MRI. Changes in knee cartilage volume, cartilage defects and bone marrow lesions over 2 years were assessed from MRI using validated methods. Analyses of the change in cartilage volume, cartilage defects and bone marrow lesions associated with lifestyle factors will be performed using linear/logistic regression, adjusting for confounders.

A/Prof Anita Wluka
Phone: 9903 0994, Email: anita.wluka@monash.edu

Updated July 2012
A/Prof Anita Wluka is a clinical rheumatologist. She is interested in musculoskeletal conditions in particular osteoarthritis, and how it relates to metabolic and bone disease. She has two critical outcomes in her sights. The first is to identify how to delay the onset of osteoarthritis. The second is to make the disease easier for patients to manage.

**Obesity and knee joint health**

Osteoarthritis (OA) is the most common form of arthritis and leading cause of disability. Of all the risk factors identified, obesity is the strongest modifiable risk factor for OA. A number of studies have shown that being overweight increases the risk of developing the disease with weight loss being shown to decrease pain and increase function. Obesity has also been associated with the progression of the disease, yet the relationship between obesity and OA is poorly understood and much of the literature is filled with speculation. There is some evidence to suggest that obesity may lead to the increased risk of OA via biomechanical mechanisms. The biomechanical theory concludes that increased weight leads to increased loading on the joint and cartilage damage and degradation. There is also emerging evidence that the biomechanical effect of obesity on the risk of knee OA may be modified by muscle mass. Muscles play an important role acting as shock absorbers and also stabilizing the knee. Biomechanical mechanisms are likely to good targets for preventative strategies. Due to the obesity epidemic now faced by western society, combined with an aging population will ultimately result in a greater prevalence of OA and burden on society. Research into understanding the precise relationship and mechanisms by which obesity is related to OA are imperative.

This study aims to examine the relationship between obesity, body composition and knee alignment and changes in knee structure indicative of OA development. Furthermore the effect of weight loss will also be examined by following a group of individuals undergoing laproscopic gastric banding surgery and comparing changes in knee structures to obese individuals who are not.

This study was a longitudinal cohort study over 2 years. 250 men and women aged 25-60 years were recruited through local media. Weight and body composition (fat mass and muscle mass) using DEXA were obtained for each subject. Each participant had a knee magnetic resonance imaging in 2005-2008 and 2 years later. Changes in knee cartilage volume, cartilage defects and bone marrow lesions over 2 years were assessed from MRI using validated methods. Analyses of the change in cartilage volume, cartilage defects and bone marrow lesions associated with obesity, body composition and knee alignment will be performed using linear/logistic regression, adjusting for confounders.

**Muscle size and strength and the early structural changes of knee**

**Osteoarthritis (together with Dr Yuanyuan Wang and Dr Donna Urquhart)**

Knee osteoarthritis is a major public health problem. It has been suggested that quadriceps muscle strength has a protective effect against developing this condition and its structural progression. How knee strength relates to the development of the early structural changes of osteoarthritis in a young to middle aged asymptomatic population is not known. This is important as quadriceps strength is potentially modifiable, and so may be important in the prevention and treatment of knee OA.
This study aims to examine whether quadriceps muscle strength and cross sectional area relate to the early structural changes of knee OA, and their evolution over 2 years.

This study will utilise data from a community based study of women, from the Geelong Osteoporosis study. This study has data on 160 women, aged 20 – 62, who were recruited from the electoral roll, to be representative of the Australian female population. The aim of this study is to examine whether 2 measures of quadriceps function (strength and cross sectional area) relate to knee structural changes and their evolution over 2 years.

The right knee of all women was imaged using Magnetic Resonance Imaging at 2 time points, 2 years apart. Quadriceps strength was measured at baseline. From the MRI images, quadriceps cross sectional area will be measured. Measures of knee structure at baseline and 2 years later have been made using validated methods.

Analyses relating measures of knee strength to knee structure will be performed using linear/logistic regression, adjusting for potential confounders.

**Change in knee bone size in healthy women and the relationship to the early structural changes of knee Osteoarthritis (together with Dr Yuanyuan Wang)**

Knee osteoarthritis is a major public health problem. The role of bone, integral to the pathogenesis of knee OA, is receiving increasing attention as bone changes have been related to change in knee symptoms and disease progression. This is of particular importance, as bone metabolism may be a useful target for affecting this disease, in contrast to cartilage, which is less metabolically active.

Bone area is known to increase in older women, with the rate of change increased in those with osteoarthritis. Change in bone area has been related to changes in other knee structures also. The rate of change in bone size at the knee, and factors affecting this, in a healthy younger asymptomatic population is unknown.

This study aims to characterise change in tibial bone area in a healthy younger asymptomatic population of women, and identify factors affecting this.

This study will utilise data from a community based study of women, from the Geelong Osteoporosis study. This study has data on 160 women, aged 20 – 62, who were recruited from the electoral roll, to be representative of the Australian female population. The aim of this study is to examine the change in tibial bone area, and its relationship to other knee structural changes, and factors affecting change in bone area over 2 years.

The right knee of all women was imaged using Magnetic Resonance Imaging at 2 time points, 2 years apart. Bone area will be measured at baseline and at follow up from the MRI images. From the MRI images, other measures of knee structure at baseline and 2 years later have been made using validated methods. Measures of bone health have been made at baseline, including bone mineral density.

Analyses relating change in bone size to knee structure and risk factors for change in bone size will be performed using linear/logistic regression, adjusting for potential confounders.

Updated July 2012
Bone health and back pain (together with Dr Donna Urquhart)

Low back pain is a major public health problem worldwide, resulting in significant disability and financial costs. No one factor has found to be a significant cause of low back pain. Whilst psychosocial factors are important, there is increasing interest in how back structure relates to back pain. As bones form much of the back structure, bone health may be important. Whilst the layman believes that bone health, in particular osteoporosis, may contribute to back pain, this has not been examined in a community based population.

This study aims to examine whether factors relating to bone health, such as bone mineral density and markers of bone metabolism, are related to low back pain.

This study will utilise data from a community based study of men, the Geelong Osteoporosis study. This study has nearly 1000 participants, aged 20 – 85, who were recruited from the electoral roll, to be representative of the Australian population. The aim of the main study is to characterise factors associated with bone health in an Australian population.

Measures of bone health include calcium intake, bone mineral density, serum markers of bone metabolism and muscle strength using validated methods. Back pain has been measured using validated questionnaires.

Analyses of low back pain and markers of bone health will be performed using linear/logistic regression, adjusting for confounders.

Dr Donna Urquhart
Phone: 0439 990 275, Donna.Urquhart@monash.edu;

Dr Urquhart is a NHMRC Career Development Research Fellow and clinical physiotherapist in the Musculoskeletal Unit. Her main research interests in understanding factors that are associated with the development and progression of musculoskeletal conditions, in particular low back pain and osteoarthritis.

What is the role of body composition (obesity) in the development of musculoskeletal pain and disability?

Musculoskeletal conditions are a major public health problem and obesity is in epidemic proportions. It has been hypothesised that greater body weight may result in greater demands on the joints of spine and lower limbs leading to structural degeneration and pain. However, current evidence indicates that body weight is only a weak risk factor for musculoskeletal pain, particularly low back pain. Moreover, measures of body weight do not take into account an individual’s body composition, that is their fat and muscle mass, and previous work suggests that fat and muscle mass have differential effects on pain.

The aim of this study is to determine the role of body composition, in particular fat mass and lean tissue mass, in the development of low back, knee and foot pain and disability.
This study was a longitudinal cohort study. Men and women aged 25-60 years were recruited through local media. Body composition (fat mass and muscle mass) was assessed using DEXA. Low back, knee and foot pain and disability were assessed using questionnaires at 2 time points.

Analyses of development of musculoskeletal pain and disability associated with body composition will be performed using logistic regression, adjusting for confounders.

**Does the structure of the spine matter in low back pain?**

Low back pain is a major public health problem worldwide, resulting in significant disability and financial costs. No one factor has found to be a significant cause of low back pain. It has been hypothesised that changes to the structure of spine may lead to the development of low back pain. However, the results to date are conflicting. Obesity is in epidemic proportions in western society. It has been hypothesised that the additional body weight with obesity may accelerate degeneration of the spine. However, no study has compared the structure of the spine between obese and non-obese individuals.

The aim of this study is to examine whether there is a relationship between structural features of the spine and low back pain, and whether this differs between obese and non-obese individuals.

This study was a cross-sectional study. Men and women aged 25-60 years were recruited through local media. Low back pain and disability were assessed using questionnaires. Each participant had a spine magnetic resonance imaging and spine structure was measured using validated methods.

Analyses of low back pain and disability associated with spine structure will be performed using linear/logistic regression, adjusting for confounders.

**MRI investigation of spinal and abdominal muscles in low back pain**

There is evidence to indicate that changes to the spinal and abdominal muscles are associated with the development of chronic low back pain. Even though obesity is in epidemic proportions and it has been hypothesised that the additional body weight with obesity may result in changes to the spine and its surrounding structures, no study has compared the spinal and abdominal muscles between obese and non-obese individuals.

This study aims to examine whether there is a relationship between the size and quality of the paraspinal and abdominal muscles and low back pain, and whether this differs between obese and non-obese individuals.

This study was a cross-sectional study. Men and women aged 25-60 years were recruited through local media. Low back pain and disability were assessed using questionnaires. Each participant had a spine magnetic resonance imaging and spinal and abdominal muscles were measured using validated methods.

Analyses of low back pain and disability associated with spinal and abdominal muscles will be performed using linear/logistic regression, adjusting for confounders.
Infectious Diseases

Prof Karin Leder
Tel: 9903 0577 Email: karin.leder@monash.edu

A/Prof Karin Leder heads the Infectious Disease Epidemiology unit and her research interests include traveler’s health, health issues in immigrants and refugees, and waterborne infections.

Improving the health of international students in Victoria: Novel strategies to promote awareness of tuberculosis and travel related infections among a high-risk group

The number of international students in Australia has risen markedly in the last decade, with almost 190,000 enrolled in higher education and >85,000 in Vocational Education and Training in June 2011; nearly 30% of these students are based in Victoria. China, India, Malaysia and Viet Nam are the most common countries of origin, however international students in Australia originate from >160 different countries. This group is at high risk for tuberculosis (TB) and travel-related infections. TB notifications in Victoria are 10-fold higher among international students than Australian-born individuals. International students are also over-represented among notifications of enteric fever, hepatitis A, and malaria, often acquired during travel to their home country. This project aims to improve the health of international students in Victoria by employing novel strategies to promote i) awareness among students and their health care providers of symptoms consistent with active TB which require early medical review; and ii) the importance pre-travel medical consultations for students planning a trip home to allow interventions such as education, immunisation, and preventive medication.
Methods: Identify key stakeholders who provide support and services to international students, including student support advisors, general practitioners, health-insurance providers, doctors who perform visa medial screens, and professional organisations in the fields of medicine and education. Develop a range of materials to deliver these targeted health-related messages.
Clinical Epidemiology

Dr Dragan Ilic

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Dr Ilic coordinates several units for the Bachelor of Health Science and MBBS degrees. In addition to his teaching commitments, Dr Ilic also runs a program of research in medical education, and clinical research in prostate cancer.

Assessing perceptions of evidence based practice across medical specialities

Evidence based practice (EBP) is a method of assisting health professionals incorporate the best information when making healthcare decisions and policy related decisions. The ability to implement EBP in the healthcare environment depends on the level of competency the health professional has in EBP. Few studies have explored how competency in EBP is represented across health disciplines. Although traditional continuing medical education (CME) seminars adopt a didactic method of teaching, current research indicates that this does not significantly alter the behaviour of health professionals. This project will adopt both qualitative and quantitative methodologies to explore what barriers and facilitators health professionals encounter when attempting to implement EBP in their daily healthcare practice. This project will also compare whether these attitudes and perceptions differ amongst medical specialities.
Research Methodology
Data Management

Prof Chris Reid
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Chris is the Head of Centre for Information and Data Management Unit and the Deputy Head of the Centre of Cardiovascular Research and Education in Therapeutics. Over the past ten years, his work has led to the development of a series of clinical tools for general practitioners to assist in the uptake of evidence-based management of both primary and secondary prevention of cardiovascular disease. The Information below should give you an idea of the kind of research undertaken by him and his team.

Projects using the Australian and New Zealand Society of Cardiac and Thoracic Surgeons (ANZSCTS) Database;

The Australian and New Zealand Society of Cardiac and Thoracic Surgeons (ANZSCTS) Database Program records details of all adult cardiac surgical procedures performed in participating units across Australia. The program publishes annual reports describing the activities and outcomes of participating units in a comparative, de-identified format.

Currently, 19 of the 25 Australian public hospitals and 6 private hospitals are participating in the database. Since the instigation of the project in 2001, the ANZSCTS web database portal contains over 44,000 records. To date, over 15 manuscripts arising from the program have been published including papers on an Australian Risk Prediction Model for Coronary Surgery (AusSCORE), on the short and longer term outcomes and in collaboration with other interventions.

Updated July 2012
Australia’s Progress towards a National Cardiac Surgery Registry – A potential Model for the Asia Pacific Region?

OBJECTIVE: Benchmarking quality and safety outcomes associated with cardiac surgical procedures is an important aspect of performance monitoring and quality improvement. United States and European societies have established registries to enable surgeons and stakeholders to understand variations in outcomes and factors associated with performance. Our aim was to develop a National Cardiac Surgery Registry for Australia and to determine the potential for the model to be adopted for use across the Asia-Pacific Region.

Impact of Preoperative Factors on Mortality Following CABG with renal Dysfunction

Objectives: To analyze preoperative risk factors for early mortality (30-day, died within 30 days of surgery) following isolated coronary artery bypass grafting (CABG) patients with renal dysfunction (GFR less than 60mL/min/173m2 or on dialysis).

Methods: Data was collected between 2001 and 2010 from 20 hospitals in Australia. Logistic regression and stepwise variable selection will be used to identify pre-operative risk factors for 30-day mortality. ROC and H-L will be used to evaluate model's efficiency.

Projects involving the Melbourne Interventional Group (MIG)

Since 2004, the Melbourne Interventional Group (MIG) has collected standardised procedural and follow-up data on consecutive patients undergoing Percutaneous Coronary Intervention (PCI) across multiple sites in Victoria.

Enrolment currently sits at over 17,000 PCI procedures. Thirty day and twelve month telephone follow-up on all participants are undertaken. Linkage with the National Death Index occurs routinely to provide longer term outcome data.

MIG continues to present widely at national and international cardiology meetings. In addition to the 23 manuscripts already published, several more are either in review or well underway.

MIG continues to collaborate widely, especially with the cardiac surgeons and the ANZSCTS registry.

Evaluating the Performance of the CRUSADE Bleeding Risk Score for Patients with Acute Coronary Syndrome Undergoing Percutaneous Coronary Intervention

Background: Current international guidelines recommend assessment of bleeding risk in patients with acute coronary syndrome (ACS). The “Can Rapid risk stratification of Unstable angina patients Suppress ADverse Outcomes with Early implementation of the ACC/AHA guidelines” (CRUSADE) bleeding score predicts the likelihood of major bleeding in patients with ACS. We aim to assess the ability of the CRUSADE score to predict in-hospital bleeding in a contemporary cohort of patients with ACS.
Methods/Results: We have analysed outcomes in 2,509 patients with ACS undergoing PCI between April 2008 and June 2010 in the Melbourne Interventional Group registry. For each patient we will calculate their CRUSADE bleeding-risk score (using gender, creatinine clearance, heart rate, heart failure, peripheral vascular disease, diabetes mellitus, and systolic blood pressure; however, haematocrit was unavailable). Discrimination ability and calibration of the model will be assessed using receiver operating characteristics (ROC) and Hosmer-Lemeshow (H-L) statistics, respectively.

Heart Rate as a Predictor of Outcome Following Percutaneous Coronary Intervention

Background: Data from previous studies of patients with heart failure and coronary artery disease suggest that patients with higher resting heart rates (HR) have worse cardiovascular outcomes. We want to evaluate whether HR immediately prior to percutaneous coronary intervention (PCI) is an independent predictor for 30-day outcome.

Methods and Results: We analyzed the outcome of 3,720 patients who had HR recorded prior to PCI from the Melbourne Interventional Group registry. HR and will be analysed by quintiles.

Long term survival of elderly patients undergoing percutaneous coronary intervention (PCI) for acute coronary syndrome (ACS) complicated by cardiogenic shock (CS)

Background: Few studies have reported on long term survival in elderly patients with ACS complicated by CS undergoing emergent PCI. We sought to assess long term survival of elderly patients (age ≥75 years) undergoing PCI for ACS complicated by CS in a contemporary multicentre PCI registry.

Methods: We will analyse baseline characteristics, procedural, clinical outcomes and long term survival in 421 consecutive patients presenting with ACS and CS who underwent PCI from the Melbourne Interventional Group registry.

Projects using the Australian Rheumatology Association Database (ARAD)

Collaborations between the Australian Rheumatology Association and CIDMU have resulted in the establishment of the Australian Rheumatology Association Database (ARAD) – a voluntary national registry which collects important health information from Australian patients with inflammatory arthritis. The aim of the registry is to monitor the short and long term benefits and safety of new biological disease-modifying anti-rheumatic drugs.

Information is collected from patients via questionnaires every six months, which include questions about medical history, medication history, responses to medications, physical functioning and quality of life. Rheumatologists are provided annual reports. CIDMU has recently developed a web-based system which allows individuals to complete their questionnaire on-line, which has been very well received by participants.
Patients and rheumatologists across Australia contribute to ARAD, with over 4,000 participants enrolled in the registry and over 200 rheumatologists referring patients to ARAD.

**Projects involving the ASia Pacific Evaluation of Cardiovascular Therapies (ASPECT)**

A collaboration called the ASia Pacific Evaluation of Cardiovascular Therapies (ASPECT) has been proposed. Initially, it will involve investigators from the following PCI databases: in Australia, the Melbourne Interventional Group Registry database, in Singapore the NDRO database, in Malaysia the NCVD database & in Hong Kong the RGC database. The plan is to create common dataset for analysis. It is intended to be a collaborative research project across the Asia Pacific region. The ASPECT Collaboration will establish a Steering Committee and set out a clear Terms of Reference.

Cardiovascular interventions, in particular PCI is a high cost, high risk activity which has become widely adopted in the clinical setting across the region. Registries in the individual institutions and countries are valuable; however the opportunity exists to establish collaboration across the Asia Pacific region to achieve the following four major aims.

**Aims**

1. To understand the characteristics of patients undergoing PCI and cardiac interventions across the Asia Pacific region
2. To benchmark the outcomes of patients undergoing PCI and cardiac interventions across the Asia Pacific Region
3. To develop an appropriate ethnic specific risk adjustment model for patients undergoing PCI and cardiac interventions across the Asia Pacific Region.
4. To establish a registry framework for research, education and training in the area of cardiovascular interventions across the Asia Pacific Region
Health Services and Global Research
Centre of Research Excellence in Patient Safety (CREPS)

Dr Sue Evans
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Dr Sue Evans is a Senior Research Fellow in the NHMRC Centre of Research Excellence in Patient Safety. Sue’s research is on lie around the establishment of clinical registries.

Prostate cancer registry: quality of care project (Together with A/Prof Jeremy Millar)

The prostate cancer registry was established in 2009 to monitoring patterns of care and quality of service provision provided t men following a diagnosis of prostate cancer. It currently captures information from 85% of all men diagnosed in Victoria. Current projects involve understanding how best to monitor quality of care, investigating adverse events associated with treatment and determining whether men are receiving equitable, accessible care across Victoria. There is some evidence that variation in survival exists in regional areas; there is a three-fold higher mortality rate following diagnosis of prostate cancer in one regional integrated cancer services compared to another, and regional dwellers fare worse than their metropolitan counterparts. More recently work is underway to link the PCR with biobanks to provide longer term biomarker research to prosper. The project you will be part of will use the PCR to assess quality of care across Victoria.
Prostate cancer registry: assessing the reliability and validity of a telephone-administered quality of life tool (Together with A/Prof Jeremy Millar)

The prostate cancer registry was established in 2009 to monitoring patterns of care and quality of service provision provided to men following a diagnosis of prostate cancer. It currently captures information from 85% of all men diagnosed in Victoria. We have developed a quality of life tool that is succinct to administer and is worded in such a way as to not cause discomfort to either the person administering the tool or men on whom it is being administered. This proposal seeks funding to test this adapted tool in an Australian setting, to determine whether it will accurately, reliably and validly collect important patient reported outcomes for an ongoing population-wide prostate cancer register.

We hypothesise that the newly developed 6-item prostate-specific functional status (PSFS) tool will provide a parsimonious, accurate, valid, and reliable measure of disease-specific quality of life in men with prostate cancer. We aim to determine (a) whether answers collected by the PSFS tool are reproducible (reliable); and (b) whether the PSFS tool accurately collects aspects of quality of life which are important to men with prostate cancer (valid).

Prostate cancer registry: A cost utility study of treatment options for prostate cancer (Together with Prof Ajay Mahal)

The prostate cancer registry was established in 2009 to monitoring patterns of care and quality of service provision provided to men following a diagnosis of prostate cancer. It currently captures information from 85% of all men diagnosed in Victoria. The purpose of this project is to determine, from the healthcare provider perspective, the cost utility in terms of quality-adjusted life years gained following low-dose rate brachytherapy (LDRBT) high-dose rate brachytherapy (HDRBT), external beam radiation therapy (EBRT), open radical prostatectomy (ORP) and robotic-assisted laparoscopic radical prostatectomy (RALRP) for treatment of low recurrence risk prostate cancer disease. Costs will be collected for the first two years of treatment, and in addition, costs will be estimated for longer periods using a Markov modelling framework. We hypothesise that there is variation in the cost effectiveness of treatments for men with low recurrence risk prostate cancer and that this work will assist healthcare providers in identifying the value of health care programs.

You will work as a member of the PCR team with supervision from the database custodian and a health economist.

Dr Anna Barker
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Dr Anna Barker works as a senior research fellow in the Centre of Research Excellence in Patient Safety. Her research interests are in hospital falls, pressure ulcers and risk adjusted mortality monitoring and care of older people in residential aged care, hospitals and the community.
Nurse and senior management perceived barriers to effective falls prevention in acute Australian hospitals

Aim

To assess nurse and senior management perceptions of barriers to, and facilitators of, effective falls prevention in seven acute hospitals in Australia prior to the implementation of the 6-PACK falls prevention program.

Method

The project will undertake 12 focus group and administer a questionnaire to nurses working on wards with a high incidence of falls; and interviews with senior hospital staff involved in falls prevention. Descriptive statistics will be used for quantitative data and qualitative description methods for qualitative data.

Capture-recapture analysis of fall event data in Australian acute hospitals

Aim

Despite the importance of fall data for effective planning and monitoring of hospital falls prevention activities, reporting systems rarely capture every fall. Methods used to identify fall events in hospitals include spontaneous reporting to nurse unit managers (NUMs), documentation in medical records and incident reporting databases. Combining these data sources may improve knowledge about the frequency of falls in hospitals. The aim of this study was to estimate the incidence of falls in 26 acute wards from seven hospitals using data from these three sources.

Method

Data will be prospectively collected as part of the 6-PACK falls prevention project between September 2011—April 2012. Students will be trained to collect data and will view medical records of all admitted patients daily on participating wards to record information about documented falls. They will obtained a daily verbal report from the NUM about falls known to have occurred within the previous 24 hours. Data will be triangulated with falls recorded in the hospital incident reporting database. A three-source capture-recapture analysis will be performed to estimate the real number of falls occurring during the observation period.


The 6-PACK program to decrease falls and fall injuries in acute hospitals: Protocol for a cluster randomised controlled trial

Background: Falls are the most common hospital accident and are a source of personal harm, preventable hospitalisation costs and access block through increased length of stay. Despite an increase in falls prevention awareness and activity over the last decade, the rates of reported fractures from falls in hospitals appear not to have decreased. There is evidence from a recently
published longitudinal study\textsuperscript{1} that implementation of a simple targeted nurse delivered program—
the 6-PACK—can decrease fall injuries.

Objective: This cluster randomised controlled trial (RCT) aims to provide evidence of the efficacy and cost-effectiveness of the 6-PACK program for preventing falls injuries in acute hospitals and also investigate its transferability to other acute hospital settings.

Methods: Twenty-four acute medical and surgical wards from six hospitals throughout Australia will be recruited. Wards will be matched by type and baseline fall injury rates then randomly allocated to either the 6-PACK intervention (12 wards) or the standard care control group (12 wards). The 6-PACK program includes completion of a nine-item falls risk assessment and six nursing interventions: “falls-risk” alert sign above the patient’s bed; supervision of patients while in the bathroom; ensuring that the patient’s walking aid is within reach; establishment of a toileting regime; use of a low-low bed lowered to floor level and use of bed/chair alarm. Intervention wards will receive 6-PACK equipment (falls risk alert signs, low-low beds and bed/chair alarms) and there will be a supported implementation (small group training and assignment of clinical leaders) and review strategy (audit, feedback and reminders). A cost effectiveness study of the 6-PACK program will also be conducted. The effectiveness of the 6-PACK implementation will also be examined including assessment of barriers and enablers to falls prevention using a structured mixed methods evaluation. Sustainability will be assessed in the year after the RCT when there will be a staged withdrawal of the research staff from the sites. The primary outcome measures are fall and fall injury rates in the 12 months after the 6-PACK is implemented. The cost-effectiveness outcome is “cost or saving per fall prevented” and “cost or saving per fall injury prevented” calculated from differences in mean costs and effects in the intervention and control groups to generate an incremental cost-effectiveness ratio. Outcome analyses will be undertaken on an intention to treat basis. Changes in fall and fall injury rates will be compared between groups using negative binomial regression where data are adjusted for clustering and pairing of wards. Analysis will include risk adjustment for patient age and a documented diagnosis of dementia or delirium.

What is the association between mobility and falls risk for people living in residential aged care? Can the Physical Mobility Scale discriminate between residents at risk of falling and those not at risk?

Design: Prospective cohort study.

Setting: Six residential aged care facilities in Australia.

Participants: Eighty-seven high and low-level care permanent residents.

Outcome Measures: The primary outcome measure will be measuring the number of falls in the six months after the initial mobility assessment. Mobility of all participants will be assessed using the Physical Mobility Scale (PMS). The PMS will include nine mobility items assessed on a six point scale (0-5) yielding a total score out of 45.
Reducing serious fall-related injuries in acute hospitals: are low-low beds a critical success factor?

Aim:

This study looks into the associations between occurrence of serious fall-related injuries and implementation of low-low beds at The Northern Hospital.

Background:

A nine-year evaluation at The Northern Hospital found a significant reduction in fall-related injuries after the 6-PACK falls prevention program was implemented. Low-low beds are a key component of the 6-PACK that aims to decrease fall-related injuries.

Design: A retrospective cohort study.

Methods:

Retrospective audit of The Northern Hospital inpatients admitted between 1999-2009. Changes in serious fall-related injuries throughout the period and associations with available low-low beds will be analysed using Poisson regression.

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Dr Carolina Weller is a Senior Research Fellow at School of Public Health and Preventive Medicine, Monash University. Carolina’s career has involved appointments as a clinical wound consultant, researcher, health policy advisor and academic. In 2011 Carolina was awarded NHMRC Primary Health Care Research, Evaluation and Development (PHCRED) fellowship. Carolina is involved in developing and testing interventions to improve patient safety and quality of care for people with chronic wounds. She also conducts research in developing and testing interventions to improve healing rates, including reasons for non-adherence to treatments.

Some project examples of Carolina’s recent research.

Randomised Controlled Trial of Tubular Compression System for Venous Leg Ulcers

This multicenter randomised controlled trial will compare three layer tubular bandage system (3L) with short stretch compression bandage (SS) for treatment of venous leg ulcers (VLU). Multi-component compression is best practice treatment for venous leg ulcers, but many compression systems are not well tolerated and are unaffordable. Outcome measures will include percentage wound reduction from baseline compared to week 12 following randomisation, proportion of ulcers healed, Quality of Life measures, self-reported bandage adherence, recurrence rates and cost effectiveness.
Healing leg trauma wounds following falls in people with chronic venous insufficiency

Falls often cause leg wounds in the elderly. Healing may be compromised in people with chronic venous insufficiency and even though multi-component compression is acknowledged as best practice treatment many compression systems are not well tolerated, are unaffordable and are challenging to apply. The aim of this study is to compare a cost effective, simple to apply compression bandage for treatment of venous ulcers following falls. This multicenter randomised controlled trial (RCT) will measure proportion of ulcers healed, Quality of Life measures, self-reported bandage adherence, recurrence rates and cost effectiveness.

Improving Venous Ulcer Healing Rates

Venous leg ulcers represent the most common chronic wound problem managed in General Practice. The aims of this study are to determine whether current practice is in line with Best Practice Guidelines and to investigate management and referral practices. This cross sectional survey in General Practice Medicare Locals in Melbourne, Australia and will survey General practitioners and practice nurses. Main outcome measures will include compliance with evidence-based guidelines for management, and referral practices to specialist services.

Measuring clinical and cost effectiveness of negative pressure wound therapy (NPWT) in Hospital in the Home (HITH) post-operative diabetic foot wounds

This pilot randomised controlled trial will compare NPWT to usual care in participants with post-operative foot wounds cared for in the home environment. Outcomes will include time to wound healing, NPWT tolerability, pain assessment quality of life and costs.

Dr Judy Lowthian
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Dr Judy Lowthian is a senior research fellow within the Centre for Research Excellence in Patient Safety (CREPS). Her research includes longitudinal analyses and linkage of population-based datasets, epidemiological modelling of the effects of numerous factors on health service utilisation with predictive modelling and forecasting of future demand; qualitative analyses of patient- and doctor-based interviews; and management of large research studies.

Determining best practice for safe discharge of the older emergency patient

Background & Objectives

Increasing numbers of older patients presenting for emergency hospital care is a major worldwide concern. The fastest growth is in people aged ≥65 years representing 18% of all presentations. An ED visit for older people is a sentinel health event that can lead to substantial functional decline and adverse outcomes. This age group present with more complex conditions, consume more resources, have longer ED stays, are more likely to be admitted, have long hospital stays, and a higher rate of
re-presentation. This will increase with population ageing. Although social/psychological support is often required there is little evidence this occurs in a systematic coordinated manner.

Safe Elderly Emergency Discharge (SEED) project aims to

- determine whether current models of emergency care ensure safe discharge and facilitate optimal health outcomes for older patients
- develop a tailored evidence-based care framework applicable to Australian and international settings

**Methods**

**PHASE 1: Review of best practice:** Systematic review of best evidence for models of care for older patients in ED or short stay units.

**PHASE 2: Evaluation of methods for assessment of unsafe discharge risk:** Evaluation of effectiveness of discharge risk screening tools designed to reduce risk of unsafe discharge.

**PHASE 3: Audit current practice against published best practice:** Prospective process mapping of the patient care journey in 3 EDs in Australia and UK: during ED stay and post-discharge, with monitoring of health outcomes in the following 6 months.

**Expected Outcomes**

- Development of an Older Patient Care Service Framework:
- Redesign of emergency care for older patients. To include:
- Development of policy and principles of management, care pathways, and performance improvement measures
- Validation of an unsafe discharge screening tool in an Australian & English cohort
- Development of a stream-lined care pathway
- Reduced ED length of stay
- Improved patient experience
- Safe discharge with optimisation of health outcomes, reduced unplanned emergency re-presentations; reduced need for higher level residential care; reduced unplanned deaths
- Reduced emergency demand and improved patient flow

Updated July 2012
**International Public Health Unit**

**Prof Brian Oldenburg**
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Professor Brian Oldenburg is Head of the International Public Health Unit (IPHU). His research focuses on improving the management and prevention of non-communicable disease such as diabetes and heart disease in low and middle income countries. The following project will give you an idea of the type of research undertaken within IPHU.

**ADVENT Study**

**Project Manager** Dr John Oldroyd Email: john.oldroyd@monash.edu

Depression and coronary heart disease pose a significant burden on patients, their families and the Australian healthcare system. Despite this, there has been limited success in improving health outcomes in this co-morbid patient population using current treatment approaches. The ADVENT study is a prospective cohort study investigating the interplay between psychosocial and biological factors relevant to symptoms of depression and anxiety in post-MI patients. This study will examine: (1) the role of specific cognitive and somatic symptoms as predictors of health-related quality of life outcomes; (2) how these symptoms are related to long term vocational functioning and use of healthcare services; and (3) how heart rate variability - a strongly established psychophysiological biomarker - moderates these associations. This research will lead to the development and delivery of more effective pharmacological, psychological and behavioural interventions.

**A/Prof Catherine Joyce**
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Dr Catherine Joyce is a health services researcher with a particular interest in health workforce research and other areas of policy-relevant research.

**The MABEL (Medicine in Australia – Balancing Employment and Life) study.**

The MABEL (Medicine in Australia – Balancing Employment and Life) study is a prospective longitudinal study of workforce participation of Australian doctors, funded by the NHMRC.

The study commenced in 2008 with a cohort of approximately 10,500 doctors (see [www.mabel.org.au](http://www.mabel.org.au/)). There are now 4 waves of data available and data collection is ongoing.

There is a wide range of topics available associated with the MABEL project, for example:

- Determinants of doctors’ health
- Exits and re-entries to the medical workforce
- Differences between rural and urban doctors (e.g. do rural doctors do more ‘procedural’ work than urban doctors?)
- Personality and locus of control of doctors
- Shifts between clinical and non-clinical work by Australian doctors
- Gender differences in practice styles and workforce participation preferences

Honours projects with the MABEL study involve statistical analysis of data from the study, and drawing out the policy implications of the research findings. Honours students have the opportunity to participate in the multi-disciplinary research team conducting the study. Specific topics can be provided for students or negotiated with students.

**A/Prof Andre Renzaho**
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A/Prof Andre Renzaho heads the Migration, Social Disadvantage, and Health Programs unit within the International Public Health Unit. He is a Public Health and Nutritional Epidemiologist with expertise in the area of migration and health, complex humanitarian emergencies, and development aid.

**Socio-cultural aspects of obesity prevention: The development, testing, and evaluation of a theoretical framework for inclusion in large scale obesity interventions**

Obesity has reached epidemic proportions but remains unequally distributed. Socio-economically disadvantaged communities experience an excess in disease burden related to obesity. However Socio-economically disadvantaged communities remain under-represented in obesity research and interventions because researchers assume they fail to understand the importance of the research process and are unable to participate because of language barriers. Current evidence suggests that
these communities are on the whole no less likely, and possibly even more likely to participate in research when approached than mainstream communities; but under represented due to their reduced likelihood of being invited to participate. While, existing ecological models recognise differences in the obesogenic environments and the role of socio-cultural influences, there is a lack of a described socio-cultural theoretical framework to support obesity prevention programs. There is an urgent need to develop a comprehensive socio-cultural framework to 1) allow researchers better understand rules and values that govern socio-cultural behaviours related to obesity; and 2) guide the selection of socio-cultural domains and the development of socio-cultural variables to be included in obesity prevention programs. This study seeks to develop and focus a socio-cultural tool to be included in large scale obesity prevention interventions

Methods:

1. Literature review: summary of obesity prevention programs that included a socio-cultural framework. Summarise socio-cultural domains and develop a socio-cultural checklist
2. Focus test the socio-cultural checklist using 4-5 focus group discussions
3. Using data from FGDs, revise and finalise the checklist

Necessary Skill and Knowledge: Systematic reviews and qualitative research

Dietary acculturation and changes in lifestyle among Iraqi, Cambodian, and Afghani migrants

Current evidence suggests ethnic differential in nutritional outcomes, and children of migrants seem to fare worse. Ethnic differential in children’s nutritional outcome and behaviour problems are, to some extent, a function of family processes and the environment, and for migrants, this is mediated by the level of acculturation. In Australia, factors predisposing migrant children to poor nutrition include family expectations in terms of parenting, knowledge gaps in relation to healthy eating and feeding, and family functioning and structure. This is more pronounced among newly arrived refugees and migrants, especially the inter-generational acculturation gaps where children acculturate faster than their parents, hence distorting family food and eating patterns. The study will explore the extent to which dietary acculturation is occurring, and assess factors that precipitate dietary acculturation in these sub-populations.

Methods:

1. Literature review
2. Focus group discussions

Necessary Skill and Knowledge: Literature review and qualitative research

The influence of perceived racism on lifestyle among newly arrived refugees in Melbourne-implications for chronic diseases

Newly arrived migrants are at increased risk of obesity and obesity-related diseases. It is possible racism has a role to play and it could explain within-group variability in health status and health outcomes. It has been hypothesized that racism-specific stress leads to maladaptive coping
responses and obesity-related behaviors. Greater affective stress responses are linked to lower self-efficacy to change current eating habits. More frequent maladaptive eating behaviors are correlated with a lower self-efficacy to change to adaptive eating behaviors, poorer fruit and vegetable eating habits, and worse television watching habits. However, it is important to elucidate which elements of racism play a critical role in shaping refugees and migrants’ obesity-related behaviours. This is particularly important as racism relates to the behavioral and emotional health of migrant children, but children and parents experience racism in different ways due to their differing pace of acculturation. The study seeks to document perceived racism and inter-generational acculturation gap among newly arrived refugees and examine how they relate to obesity-related behaviours. Data from this exploratory study will inform interventions and preventive strategies geared toward limiting the negative effects associated with racism.

Methods:

1. Literature review
2. Focus group discussions

Necessary skills/knowledge: Community mobilization approaches, qualitative research theories, qualitative data analysis (e.g. NVivo).

Family functioning, psychological distress and obesity among Australian children

The family environment has been identified as one of the biggest factors in childhood obesity. However, studies examining the relationship between the family environment and childhood obesity have mainly focused on feeding practices. It is possible that the family environment is dependent on the level of family functioning and parental psychological distress. Using data from the Longitudinal Study of Australian Children, this research will assess whether the level of family functioning and parental psychological distress are associated with obesity in children.

Methods:

1. Literature review
2. Quantitative data analysis

Necessary Skills/Knowledge: SPSS or STATA

A/Prof Ben Smith
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A/Prof Ben Smith works within the International Public Health Unit. Some of his research interests are: impact of mass media on health beliefs and priorities, role of physical activity in social inclusion, measurement of health risk factors and determinants and chronic disease prevention strategies for health care settings

Updated July 2012
Evaluating the effectiveness of international development projects (together with A/Prof Andre Renzaho)

As the investment in international development grows in Australia there is greater emphasis being placed on assessing the effectiveness of projects that are receiving this funding, in terms of their impacts and outcomes. There is a concern for looking beyond what is being delivered, and the extent which high needs communities are being engaged, to determining the health and social benefits that development projects are achieving.

This project will investigate the evaluation practices of leading international non-government organisations based in Australia, and explore critical factors which influence effectiveness reporting. Data collection will entail a documentary audit of projects completed in the past three years and interviews with international program officers. This will provide student researchers with an excellent opportunity to gain in-depth understanding of project planning and evaluation in the sphere of international development, and insights into the range of organisational, cultural, political and economic factors that influence international program management. A practical outcome from the research will be recommendations for strengthening effectiveness evaluation and reporting.
Occupational and Environmental Health
The WorkHealth program: Cardiovascular disease and diabetes risk factors in 400,000 Victorian workers

**Background:** Cardiovascular disease (CVD) and diabetes are two National Health Priority Areas and these diseases can impact on injury rates, disability and absenteeism in workplaces. Since 2009 WorkHealth has been offering health checks to Victorian workers to identify the risk of developing CVD and Type 2 diabetes, with referral for those at high risk.

**Aims:** To investigate the level of CVD and diabetes risk in the first 400,000 Victorian workers, participating in WorkHealth health checks and identifying predictors for those at high risk.

**Methods:** Participants undertook a voluntary, free, confidential, health check by a trained provider. Participants completed a questionnaire including lifestyle factors and medical conditions, waist circumference, blood pressure, random blood glucose, cholesterol (total, HDL) were measured. The Australian Type 2 Diabetes Risk Assessment Tool (AUSDRISK) and Absolute Cardiovascular Risk Assessment scores will be calculated during this project.

Examining primary and secondary prevention of work injuries and illness in Victoria using workers’ compensation data

The Australian population is ageing. The number of Australians aged between 50 and 64 years of age has increased from 13% of the population in 1990 to 18% of the population in 2010. These ageing trends have important implications for labour markets in Australia and elsewhere in the developed world. Many older workers are also staying in the labour market, both through choice and/or financial necessity. In Australia, the per cent of 55 plus year olds who are working, or looking for work, has increased from 22% in 1990 to 32% in 2009. Despite this large demographic shift in the labour market very little attention has been paid to understanding the implications that the
ageing workforce in Australia will have on occupational health and safety prevention programs and work-injury compensation systems.

Workers’ compensation data is a valuable source of information of the burden and consequences of injuries and illnesses attributed to work. In Victoria, WorkSafe Victoria insures approximately 85% of the labour force for injuries and illnesses they have sustained in the course of their employment. We are currently using workers’ compensation data to address important questions related to the incidence and consequences of work injury within the context of an ageing labour market. To do this we are examining workers’ compensation claims submitted to WorkSafe Victoria over the 15 year period, between 1995 and 2009. For each of these claims we have information on the claimant, the occupation in which they were employed, their workplace, and the consequences of their injury or illness including health care costs and time away from work. Important questions that we are trying to answer include what are the trends in work injury rates in Victoria over this time period? Are these trends consistent across different age groups? Are there important interactions between age and occupational demands that influence both risk of work injury and/or the consequences of work injury?

The results of this research program will provide a key knowledge base on the current work injury burden and associated outcomes for older workers in Victoria and Australia. This knowledge base will serve as a foundation for policy development related to the working conditions and the prevention and consequences of work-injuries among older workers in Victoria and Australia.
Water Quality

Dr Martha Sinclair
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Dr Martha Sinclair is a Senior Research Fellow in the Infectious Disease Epidemiology Unit. She has been involved in public health research on water related diseases since 1995. Areas of interest include health risks associated with conventional water supplies and with use of alternative water sources such as rainwater, greywater and recycled water.

Dr Joanne O'Toole
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Dr Joanne O’Toole has over 20 years’ experience as a water microbiologist and in laboratory accreditation. She has been employed as a consultant for government and private industry organisations. She currently holds an NHMRC Training Fellowship and her current area of research is health risk assessment associated with the use of alternative water sources such as rainwater, greywater and recycled water.
Household use of water in Melbourne- (Together with A/Prof Karin Leder)

In the context of prolonged drought followed by increased rainfall (including flooding) in Victoria, this project will explore how water is currently used around the house, and how much water (other than for drinking) people estimate they are exposed to. It will involve conducting telephone, postal and/or internet surveys to collect information on use of water, particularly rainwater and greywater, by Melbourne households. (Note: Greywater is water sourced from household kitchen, laundry and bathroom drains, but excludes water from toilets). More accurate and up-to-date information regarding the frequency of greywater and rainwater use in Melbourne will be obtained, as will data about the reasons why people choose to use (or not to use) these alternative water sources. This project will also explore how much those who use greywater know about the content of existing greywater usage guidelines.
Critical Care Research
**Intensive Care**

**Prof Jamie Cooper**

(Please contact Amanda Martin regarding the following projects Tel: 990 30343 email: Amanda.martin@monash.edu)

Professor Jamie Cooper is Monash University Director of the Australian and New Zealand Intensive Care Research Centre (ANZIC-RC), Deputy Director and Head of Intensive Care Unit (ICU) Research at The Alfred Hospital Melbourne. His research includes randomised clinical trials in traumatic brain injury, sepsis, acute lung injury, resuscitation fluids, and blood transfusion.

The following projects will be run at the ANZIC-RC is a bi-national intensive care clinical research methods centre. Currently research is being conducted by the ANZIC-RC in the following areas: Severe sepsis; Traumatic brain injury; Acute lung injury; Acute kidney injury; Blood transfusion practices; Sedation practices and Nutrition in the critically ill. The following will give you an idea as to the research undertaken within this group. If you have any further queries please do not hesitate to contact the project managers.
**ANZIC Research Centre Projects**

**ARISE-RCT: Australasian Resuscitation In Sepsis Evaluation Randomised Control Trial**

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The ARISE-RCT is a multi-centre, unblinded, randomised, controlled trial of Early Goal-Directed Therapy (EGDT®) versus standard care in patients with severe sepsis presenting to the Emergency Departments (EDs) of hospitals in Australia, New Zealand, Finland and Hong Kong.

**Goal:** The study will test the hypothesis that EGDT®, compared to standard care, reduces 90-day mortality in patients presenting to the ED with severe sepsis. The null hypothesis is that there is no difference in the risk of death between patients assigned to either EGDT® or standard care. The ARISE-RCT, along with the NIH-funded PROCESS trial, will look to validate the findings of the single-centre Rivers et al. study. Early goal-directed therapy in the treatment of severe sepsis and septic shock (Rivers, E.; Nguyen, B.; Havstad, S.; Ressler, J.; Muzzin, A.; Knoblich, B.; Peterson, E.; Tomlanovich, M. Early Goal-Directed Therapy Collaborative Group, Early goal-directed therapy in the treatment of severe sepsis and septic shock. *New England Journal of Medicine*, 2001, 345 (19), 1368-1377).
Rationale: Severe sepsis is a major public health problem. In 2004, the Australian and New Zealand Intensive Care Society Clinical Trials Group (ANZICS CTG) reported that the adult incidence of severe sepsis (a complication of severe infection) is 77 cases per 100,000 of population per year in Australia and New Zealand; representing over 15,000 patient episodes per year. Similar population incidence rates have been reported elsewhere. Importantly, 11.8% of all admissions to Australian and New Zealand ICUs are associated with severe sepsis and in-hospital mortality is 37.5%. In patients with septic shock, mortality approaches 60%. The burden of death is approximately 3 times the annual national road toll. The death rate also exceeds other diseases which significantly impact on the Australian community such as breast and colorectal cancer. Given the pressing need to reduce the mortality from severe sepsis and the class II evidence that EGDT may be an effective treatment that is not currently used in the majority of Australian and New Zealand hospitals, a phase III study to examine the effectiveness of EGDT in Australasian patients is imperative. Unless a trial specifically comparing EGDT and Australasian standard care is performed, ED and ICU specialists will remain uncertain about the benefits of EGDT to our patients and will be unlikely to adopt this potentially life-saving strategy.

EPO-TBI: Erythropoietin in Traumatic Brain Injury

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The EPO-TBI Study is a stratified, prospective, multi-centre, randomised, double-blind, placebo-controlled, phase III trial in intensive care unit (ICU) patients with moderate or severe traumatic brain injury (TBI) to determine whether erythropoietin (EPO) improves neurological function 6 months after injury. This study will be conducted in Australia, New Zealand, the Kingdom of Saudi Arabia, France, Finland and Singapore.

Goal: This trial will determine whether EPO therapy is effective and safe in TBI. If EPO is proven to improve neurological outcomes and is introduced clinically, given the high disability rate and high mortality rate, at least 150 patients may have significantly improved neurological outcomes per year in our country by the widespread application of EPO. To change only a few of these patients from an unfavourable to a favourable neurological outcome would alone result in lifetime dollar savings. This study, aimed at objectively resolving the uncertainty about EPO in ICU patients with moderate and severe TBI, is of the highest priority.

Rationale: Traumatic brain injury (TBI) is a catastrophic illness with extraordinary human and financial costs. There is substantial experimental evidence, a plausible biological rationale, and supportive clinical evidence from clinical trials to suggest a possible beneficial effect of EPO in TBI. Clinical practice is changing in the USA, prematurely leading to a loss of equipoise despite inconclusive data. There is concern that the use of EPO may increase thrombosis in critically ill patients and there are no trials with adequate methodology to study both efficacy and risks of EPO in TBI patients. The significance and cost of TBI, the possible benefits, the growing off-label use, the concern about side effects of EPO, and the lack of direct evidence of benefit make a trial of the highest quality essential to guide future clinical practice.
Nutrition therapy in adult patients requiring Extracorporeal Membrane Oxygenation

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This study is a multi-centre observational study which aims to determine current feeding practices in patients receiving Extracorporeal Membrane Oxygenation (ECMO) in Australia and New Zealand. It will be hypothesis generating for further research.

Goal: This study aims to describe the current nutrition therapy practices and profile the barriers and enablers to successful feeding in patients requiring VV or VA ECMO whilst ECMO is in situ and for 7 days post ECMO removal.

Rationale: Extracorporeal membrane oxygenation (ECMO) is becoming an increasingly used and accepted mode of life support for adult patients with severe cardio-respiratory failure. ECMO can provide much needed time until organ transplantation, be a bridge to a ventricular assist device or provide support until the patient’s cardiac and/or respiratory function improves. More recently, ECMO has been a life-saving therapy employed during the swine flu pandemic and the landmark CESAR study has shown that ECMO improves outcomes in patients with the most severe lung injury. Nutrition therapy in the intensive care setting is an essential element of patient care. It has been clearly demonstrated to reduce complication rates and improve morbidity and mortality. Despite these reported benefits, clinicians continue to deliver little more than half of the enteral nutrition (EN) they plan to provide, partly due to patient intolerance and clinical interruptions. To date there is sparse data on nutrition in adult ECMO patients. Two previously published papers have shown that enteral nutrition is possible, however patients on ECMO receive significantly less nutrition, require prokinetics earlier than would have been expected and are slow to commence and progress nutrition. The reasons for this are not well-understood, however, there are several plausible explanations which we need to confirm to understand the consequences of inadequate nutrition therapy in this group and develop solutions.

PHARLAP-RCT (Permissive Hypercapnia, Alveolar Recruitment and Limited Airway Pressure – Randomised Controlled Trial)

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Updated July 2012
The PHARLAP-RCT is a prospective, multi-centre, randomised controlled trial of the clinical efficacy of a ventilation strategy (called PHARLAP) compared to standard mechanical ventilation in acute respiratory distress syndrome (ARDS) patients across Australia and New Zealand.

**Goal:** PHARLAP is a ventilation strategy we have designed that combines Tidal volume (Vt) and plateau pressure (Pplat) limitation with a comprehensive open lung strategy. The study will investigate the clinical efficacy of the PHARLAP strategy compared to standard mechanical ventilation in ARDS patients across Australia and New Zealand. The primary outcome is ventilator free days at day 28. In addition, physiological, inflammatory, clinical and economic outcome variables will be compared between both groups. In a prospective, multi-centre, randomised controlled trial we will enrol 340 adult patients who have developed ARDS within the past 48 hours and randomly allocate them to either the PHARLAP or a control ventilation strategy.

**Rationale:** ARDS is an inflammatory condition of the lung, which is associated with devastatingly high morbidity and mortality. Vt and Pplat minimisation have been shown to decrease mortality in these patients.

**POLAR-RCT: Prophylactic Hypothermia Trial to Lessen Traumatic Brain Injury – Randomised Controlled Trial**

**Tony Trapani**

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The POLAR-RCT is a prospective, randomised controlled multi-centre trial of early and sustained prophylactic hypothermia in patients with severe traumatic brain injuries.

**Goal:** To determine whether early cooling of patients with severe traumatic brain injury (TBI) is associated with better outcomes.

**Rationale:** TBI is a leading cause of death and long term disability, particularly in young adults. Studies from Australia have shown that approximately half of those with severe TBI will be severely disabled or dead 6 months post injury. Given the young age of many patients with severe TBI and the long term prevalence of major disability, the economic and more importantly the social cost to the community is very high.

Pre-hospital and hospital management of patients with severe brain injury focuses on prevention of additional injury due primarily to lack of oxygen and insufficient blood pressure. This includes optimising sedation and ventilation, maintaining the fluid balance and draining cerebrospinal fluid (CSF) and performing surgery where appropriate. In recent years there has been a research focus on specific pharmacologic interventions, however, to date there has been no treatment that has been associated with improvement of neurological outcomes.

Updated July 2012
One treatment that shows promise is the application of hypothermia (cooling). This treatment is commonly used in Australia to decrease brain injury in patients with brain injury following out-of-hospital cardiac arrest. Cooling is thought to protect the brain using a number of mechanisms. There have been a number of animal studies that looked at how cooling is protective and also some clinical research that suggests some benefit. However, at the current time there is insufficient evidence to provide enough proof that cooling should be used routinely for patients with brain injury and, like all treatments, there can be some risks and side effects.

**POLAR-BEAR: Prophylactic hypothermia trial to Lessen traumatic brain injury – Basal Energy Assessment Research**

Emma Ridley  
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The POLAR-BEAR Study is a sub-study of 40 patients enrolled into the POLAR-RCT Study (a prospective, randomised controlled trial).

**Goal:** The primary objective is to assess the daily energy expenditure (as measured by indirect calorimetry) in traumatic brain injury (TBI) patients over the first 72 hours after enrolment in the POLAR-RCT Study so as to compare patients who receive induced hypothermia with those who receive normothermia. The secondary objective is to assess the daily energy expenditure (as measured by indirect calorimetry) in TBI patients who receive either induced hypothermia or normothermia until the end of their period on mechanical ventilation.

**Rationale:** TBI is one of the leading causes of hospitalisation, death and disability worldwide, particularly in young adults. Hypothermia is one of the most promising interventions to improve outcomes and may well become a standard of care if the POLAR-RCT Study shows improved outcomes due to induced hypothermia. Nutrition therapy is also a powerful intervention although determining the optimal amount remains a challenge especially as the various interventions such as hypothermia that are used can affect the energy expenditure of the TBI patient. By knowing how energy expenditure changes both in response to hypothermia and throughout the course of the post-hypothermia period, clinicians will have significantly more knowledge about nutritional goals. Optimising nutritional delivery requires clinicians to know the patient's nutritional needs accurately so as to meet their true needs as closely as possible, thereby avoiding the complications of over- and under-feeding. This study will provide us with this information so that intensivists and dietitians can improve nutritional delivery, a principle that is vital to improving patient outcomes in the ICU.

SPHPM Honours Handbook

Updated July 2012
SPICE: Sedation Practices in Intensive Care - A Prospective Randomised Controlled Pilot

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The SPICE Pilot Study is a prospective randomised controlled clinical trial. The study will be conducted in 8 ICUs in Australia and New Zealand and will recruit 60 patients, with a maximum of 12 patients being recruited from any one site. The pilot study aims to evaluate the feasibility of conducting a large scale multi-centre trial comparing current sedation practice with a dexmedetomidine based sedation regime.

Goal: The main objective of this study is to evaluate the feasibility of recruiting patients soon after commencement of invasive mechanical ventilation and assess the process of delivering dexmedetomidine as a primary sedative agent while avoiding benzodiazepines. The study will measure the separation between the intervention group (dex) and control group (usual practice) with respect to administration of sedative and analgesic drugs; evaluate measurement of RASS and CAM-ICU in both groups.

Rationale: Observational studies report an association between administration of the commonly used primary sedative agents, particularly benzodiazepines, and a number of potentially adverse outcomes including increased duration of mechanical ventilation, increased duration of ICU admission, incidence and duration of delirium, and cognitive dysfunction after recovery from critical illness. Dexmedetomidine has been proposed as an alternative to midazolam as a primary sedative agent and may be superior to sedative agents that are in widespread use currently. Therefore, there is a rationale to conduct a phase III randomised controlled trial comparing dexmedetomidine (alpha-2 agonist) based sedation vs standard care sedative agents, with sufficient power to determine if there are differences in patient centred end-points.

Supplemental parenteral nutrition in critically ill patients: a pilot randomised controlled study

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Goal: The specific aim of this initial pilot study is to assess whether a supplemental parenteral nutrition strategy delivers increased energy amounts to ICU patients with either confirmed or a high
likelihood of enteral nutrition insufficiency, without significant adverse effects, when compared to a standard enteral nutrition strategy.

**Rationale:** Early initiation of enteral nutrition (EN) improves clinical outcomes in critically ill patients and the provision of EN is now established as an important aspect of management in most Intensive Care Units (ICUs). Many studies have demonstrated that patients often receive insufficient amounts of their predicted nutrition requirements (i.e. underdosing) from EN for reasons which include delays in commencement, intestinal dysfunction, and the need to withhold EN for concurrent medical procedures. Because EN leads to insufficient nutritional intake, the early commencement of PN as a supplement to EN would seem a useful solution to increasing this amount. Currently clinicians are unable to make sound clinical decisions about the role of supplemental PN as current guidelines provide conflicting recommendations, mostly because few studies have addressed this issue. The delivery of PN to critically ill patients risks overnutrition, which can lead to increased metabolic stress, hyperglycaemia and derangements in liver function. Energy intake needs to be carefully administered in conjunction with adequate blood glucose control to prevent these potentially detrimental effects. Hence, it is imperative that studies are conducted to identify patient populations that may benefit.

**TEAM: A Trial of Early Activity and Mobility in ICU**

**Dr Carol Hodgson**  
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The TEAM study is a prospective, observational, inception cohort study to gather data to inform the design of a pilot randomised controlled trial (RCT) of early mobility in ventilated Intensive Care Unit (ICU) patients.

**Goal:** Patients who are mechanically ventilated for greater than 48 hours in ICU in Australia and New Zealand are not mobilised out of bed with active weight bearing while they are ventilated. The overall purpose of the study is to gather data to inform the design of a pilot RCT of early mobility in ventilated ICU patients. Specifically we aim to:

1. Describe current mobility practice, including the incidence, duration and intensity of mobilisation in mechanically ventilated patients
2. Identify patient, site, and treatment related factors that are associated with successful mobilisation in mechanically ventilated patients.

**Rationale:** Patients in the ICU traditionally receive bed rest as part of their care. They develop muscle weakness even after only a few days of mechanical ventilation that may prolong their time in ICU and in hospital, but the nature of such weakness is poorly understood.

The weakness that develops in ICU is more substantial than that which would result from bed rest alone and is referred to as ICU acquired weakness (ICUAW). This weakness might be due to the combination of inflammation and immobility. The exact mechanisms leading to the nerve and
muscle damage which occurs in critical illness are not yet fully understood and require further investigation. However, it is known that ICUAW has an effect on a patient’s ability to breathe without a ventilator, walk and perform simple activities (like washing and toileting) and often results in longer mechanical ventilation time and hence, longer hospital stays than might otherwise be expected. It may also affect a patient’s ability to return home after their hospital stay. The recovery period in Australian and New Zealand ICU patients is unknown but a trial from Canada has reported ongoing weakness five years after leaving ICU. Weakness in survivors of intensive care is known to be a substantial problem. It is currently not known whether ICUAW may be avoided or its severity reduced with simple strategies of early exercise in ICU.

There are no data about the level of activity and mobility in critically ill patients in Australian and New Zealand ICUs. These data are urgently required to plan a program of research to test whether increasing the level of mobility and activity in our critically ill patients is safe, feasible and efficacious in terms of reducing the severity of ICUAW and improving patient-centred outcomes. The program of research will first include a study to observe the mobility levels in ICUs across Australia and New Zealand to determine safety, barriers to mobility and what type of activities are undertaken by our patients.

From the observational data we plan to develop a pilot randomised controlled trial of early mobility and activity in intensive care units across Australia and New Zealand. This simple, cost-effective strategy may improve functional ability, decrease time on mechanical ventilation and improve long term outcomes in this patient group. By initiating such a program, ANZ investigators might be able to change future patient outcomes worldwide.

TRANSFUSE-RCT (STandaRd Issue TrANsfusion versuS Fresher red blood cell Use in intenSive carE (TRANSFUSE) – a randomised controlled trial)

Bridget Ady
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TRANSFUSE-RCT is a multi-centre, randomised, controlled trial, testing the effect of the freshest available red blood cell (RBC) unit compared to standard practice, on mortality in critically ill patients who require RBC transfusion.

**Goal:** The hypothesis is that in critically ill patients who require a RBC transfusion, compared to standard practice, administration of the freshest available compatible RBC decreases 90-day patient mortality. Patients will be randomised to either the "Freshest available blood group" or the "Standard care group". Freshest available blood group: These patients will receive the freshest available group-specific compatible RBC unit in the transfusion service. Standard care group: These patients will receive standard practice, which is the oldest available group-specific compatible RBC unit in the transfusion service.
**Rationale:** RBC transfusion is a very common and potentially life-saving treatment in intensive care units (ICUs). However, RBC transfusion has also been associated with an increased risk of morbidity and/or mortality in critically ill patients. Although this association may reflect a variety of factors, attention has increasingly focused on the possible adverse impact of transfusing RBCs stored for a prolonged time, and have developed a so called "storage lesion". The term "storage lesion" refers to the fact that during the 42-days storage, in a way that increases over time, red cells develop important biochemical and structural derangements. These age-related changes in transfused RBCs may have important clinical consequences. However, clinical studies on this fascinating topic remain observational, often retrospective and have very conflicting results. Moreover, systematic reviews have been inconclusive.
**Pre-hospital Emergency and Trauma Unit**

**Prof Judith Finn**
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Prof Finn is a clinical epidemiologist, who is the Director of the Australian Resuscitation Outcomes Consortium (Aus-ROC).

**Australian Resuscitation Outcomes Consortium (Aus-ROC) project**

The aim of the Aus-ROC Centre for Research Excellence is to improve outcomes from out-of-hospital cardiac arrest through the conduct of high quality multi-centre clinical trials and epidemiologic studies. It is a collaborative venture involving three States (Vic; SA and WA); with partnerships between three Universities (Monash Uni; Flinders Uni and the Uni WA) and the Ambulance Service in each State; and International collaborators in North America and the UK. We intend to conduct research projects that address each ‘link’ in the ‘chain of survival’, namely: early recognition of cardiac arrest and appropriate ambulance dispatch; early (and effective) cardiopulmonary resuscitation (CPR); early defibrillation; and post-resuscitation care. Honours projects can focus on the community; pre-hospital (ambulance) or in-hospital aspects of the management of out-of-hospital cardiac arrest. They may include the analysis of existing ambulance / hospital clinical data or the collection of new data; and involve quantitative or qualitative analysis, depending on the interests of the student.
Monash Applied Research Stream including Women’s Public Health Research, Diabetes and CVD Research, Monash Aging Research Centre and Centre for Clinical Effectiveness Research.
Diabetes and CVD research

Assoc Prof Sophia Zoungas
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A/Prof Sophia is a clinical endocrinologist at the Monash Applied Research Stream, SPHPM and Diabetes Research Director, Southern Health. Her research interests lie in diabetes and cardiovascular risk in high-risk populations.

Diabetes Renal Project
Inconsistent care, delayed and inadequate complication screening, increasing requirements for hospitalisation, polypharmacy and an inadequate focus on lifestyle factors highlight the need for improved care in patients with diabetes and Chronic Kidney Disease (CKD). An interdisciplinary health care model that provides multifaceted intervention with shared goals, an agreed care plan and optimal communication is urgently required. This research programme proposes to 1) comprehensively examine the complex health needs of people with diabetes and CKD, and 2) develop, implement and evaluate a new health service that addresses these complex needs across a range of health services. This program is led by

Dr. Jennifer Wong
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Dr Jennifer Wong is a consultant endocrinologist and the current Deputy Director of Diabetes, Southern Health. Dr Wong is a research fellow at the Monash Applied Research Stream, SPHPM.

Health Service research in diabetes including the Diabetic Foot Service at Southern Health
The Diabetic Foot Service at Southern Health, also referred to as ‘Happy Feet’ is a comprehensive acute and ambulatory care program based at Dandenong Hospital. The main components of the service are the Multidisciplinary High Risk Foot Clinic and the inpatient Diabetes Foot Unit that are both aimed at addressing the high demand for specialised care for individuals in the south-east with foot related conditions resulting from diabetes complications. A number of projects are available in this area.

Dr Georgia Soldatos
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Dr Georgia Soldatos is a Clinical endocrinologist with Monash Applied Research Stream and is the current Deputy Director of Diabetes, Southern Health.

Updated July 2012
Diabetic Emergencies Research

Diabetes mellitus can be associated with a number of severe, life threatening diabetic complications which include hypoglycaemia, diabetic ketoacidosis (DKA) and hyperglycaemic hyperosmolar state (HHS). There are national and international guidelines for the management of diabetic emergencies in both adults and children. Although the guidelines are partly evidence based, many are from consensus statements only. What is not known is how well these guidelines are adhered to in clinical practice. By establishing local and state prevalence data for diabetic emergencies, identifying common precipitating factors and usual management, we can begin to recognize areas of concern. It is hoped that this pivotal data will inform the development of clinical pathways/guidelines and standards of care that optimize patient-centred outcomes and inform appropriate resource allocation. A number of projects are available in this area.
Women’s Public Health Research
Prof Helena Teede
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Professor Helena Teede is the Head of the Monash Applied Research Stream at the School of Public Health and Preventive Medicine. Professor Teede’s work focuses on the prevention of chronic disease starting with poor lifestyle choices, through to obesity, insulin resistance (and insulin resistant syndromes such as polycystic ovary syndrome), prediabetes, diabetes and heart disease.

Reproductive Women’s Health and PCOS
This program focuses on reproductive women’s health with a strong focus on preconception health, polycystic ovary syndrome and pregnancy health. Prof Helena Teede leads this program which is closely linked to Southern Health, one of Australia’s largest health services with over 8000 deliveries per year. This program has a focus on CaLD and refugee women’s health in pregnancy. A range of honours projects are available across these areas.

Dr Jacqueline Boyle
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Dr Boyle is an obstetrician and public health researcher and the head of the Indigenous Women’s Health Program, Women’s Public Health Research. She provides a clinical service at Jean Hailes Medical Centre and in remote communities in the Top End of the Northern Territory. She is active in both education and research in Aboriginal and Torres Strait Islander Health. Her research interests are in reproductive and public health issues, particularly for young Aboriginal and Torres Strait Islander women.

Indigenous Women’s Health
Indigenous women have poor maternal health outcomes. The Indigenous women’s health program has a number of projects evaluating birth outcomes, identifying key determinants of maternal health, aiming to optimise pregnancy health in Indigenous communities, optimising contraception and addressing other aspects of reproductive women’s health. For further information contact Dr Boyle.

Dr Cate Lombard
Tel: 9594 7559 Email: catherine.lombard@monash.edu

Dr Cate Lombard is an Accredited Practicing Dietitian (APD) and Senior Research Fellow in the area of prevention of weight gain and the promotion of healthy lifestyles in women. Her research focuses on prevention of obesity, understanding and promoting healthy eating and physical activity, particularly in high-risk target groups such as young women.
Healthy Lifestyles and Public Health Nutrition

Obesity is the greatest public health challenge facing Australia. Young women are gaining the weight at a high rate and health implications are major. The Healthy Lifestyle program has a number of projects focused on healthy lifestyles for young women across many settings and populations.

Dr Amanda Vincent
Tel: 9594 7556 Email: amanda.vincent@monash.edu

Dr Amanda Vincent is an endocrinologist at the Jean Hail’s Foundation. Her research interest lie in the following areas: of menopausal medicine and specifically in premature menopause, Turners syndrome and clinical nutrition

Menopause and Midlife

This program focuses on areas including premature menopause, menopause after breast cancer and metabolic health at midlife with a focus on prevention. Research in these areas is strongly focused on women’s experiences and optimal holistic management strategies in me

Collaborative projects with the Burnet

Burnet Projects

Dr Mark Stoove

Head, Head of HIV, AIDS and STI Research, Centre for Population Health, Burnet Institute

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Dr Mark Stoove is a Senior Research Fellow and Head of the HIV and Sexual Health Program in the Centre for Population Health at the Burnet Institute. He has researched sexually transmitted and blood borne virus infection risk for more than 10 years. His primary area of expertise is the epidemiology of communicable disease transmission and the associated public health, behavioural and socio-cultural influences.

Key strategies for engaging users of Social Networking Sites for health promotion

We recently conducted a review of social networking sites (SNS) to assess their use for sexual health promotion purposes. We found that, although many organisations involved in sexual health promotion have begun to use these websites, there has been very little formal study and evaluation of them. We identified a number of organisations that appear to be using SNS more effectively than others but we were unable to further investigate the strategies that these organisations used.

This Honours project will aim to identify strategies for success in this growing area. More specifically, the findings from this study will help us better understand the content, features and approaches that successfully encourage social engagement within a SNS health promotion context. Methods will include interviewing organisations with active health promotion activities on SNS and conducting an
independent comparative evaluation of these sites. Quantitative and qualitative research will be used and the project will involve novel online recruitment methods.

Dr Mark Stoove

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Providing testing reports to general practitioners as an intervention to increase chlamydia screening

Chlamydia is the most commonly notified infection in Australia. An important component of chlamydia control is screening and testing; the majority of which occurs in general practice. Encouraging GPs to offer more chlamydia tests to young people is vital.

This is a study to look at the effectiveness of providing GPs with individual testing/positivity reports to examine if such reports change testing behaviour. This study would use a pre-post-test design, looking at number of tests requested in 2012 following receipt of a report presenting the number of chlamydia tests requested in 2011, and the number of positive tests. The study will use data from the Australian Collaboration for Chlamydia Enhanced Sentinel Surveillance (ACCESS).

Dr Mark Stoove

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Chlamydia epidemiology in Australia

Sentinel surveillance systems that provide key indicators of testing rates, positivity rates, prevalence and incidence can enhance the capacity of Australia to evaluate interventions in priority populations to control the spread of infection. The ACCESS project is such a surveillance system; it is a comprehensive surveillance system developed to evaluate the impact of national and local strategies designed to control genital chlamydia infection in Australia and to underpin Australia’s strategic response to chlamydia. Data collected through the ACCESS project is available for analysis to measure chlamydia infection and reinfection in young Australians.

Dr Mark Stoove

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Risk environments and injecting drug use – the impact of CCTV

The risks associated with injecting drug use are determined by complex interactions between individual behaviours, drug using networks, socio-political influences, legislative responses and service provision. These factors combine to create an overall risk environment for people who inject drugs that mediate blood borne virus transmission, overdose risk, the frequency of drug use and other injecting drug related outcomes. This project offers an opportunity to examine risk environments for injecting drug use from a public health, epidemiological and/or policy perspective, in the context of the introduction of closed circuit television (CCTV) monitoring systems in key...
locations. Depending on the epistemological approach, this study will involve a combination of document review, media analysis, secondary data analysis, and primary quantitative and qualitative data collection from people who inject drugs and other key stakeholders.

Dr Mark Stoove

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Content analysis of the successful health promotion project “Queer as F**K” delivery sexual health to gay men on Social Networking Sites

Online social networking sites (SNS) such as Facebook have grown rapidly in popularity. The popularity of these sites, along with their interactive functions, offers a novel environment in which to deliver health promotion messages. Over the past three years the Burnet Institute, working with the VAC have developed the Queer as F**K project that aims to engage with gay males about sexual health and other issues impacting on their life. Using a mixed methods analytical approach (quantitative and qualitative), this honours project will monitor and analyse the ongoing ‘Queer as F**K’ health promotion project over seasons 1-5, assessing reach, interactivity and engagement.

Dr Mark Stoove

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Risk behaviours and HIV among young gay and bisexual men

In recent years, the notification of newly acquired HIV has increased among young gay men in Victoria. Studies have found that gay men in Australia are having anal sex much younger than in the past and do not test for HIV as often as older gay men do. This project will investigate reported sexual and testing behaviours of young MSM by consolidating and analysing data from various surveillance data sources, with the aim of better understanding what is contributing to the increased detection of HIV in this group.

Several ongoing projects conducted by the Burnet Institute collect behavioural data from young gay and bisexual men in Melbourne, such as the Big Day Out study, HIV passive surveillance, the Victorian Primary Care Network for Sentinel Surveillance on BBVs and STIs and focus groups conducted as part of a large campaign evaluation study. These data would be analysed and interpreted alongside other available behavioural surveillance data such as those collected annually for the Melbourne Gay Periodic Survey.

Dr Mark Stoove

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Barriers to successful reintegration among people with a history of injecting drug use transitioning from prison to the community

Although release from prison is a challenging and particularly vulnerable period for people with a history of injecting drug use, this transition also offers opportunity for intervention and support. This Honours project will involve a targeted epidemiological examination of health and social outcomes.
among a cohort of people who inject drugs recently released from prison. Individual and structural barriers and facilitators related to successful reintegration outcomes (e.g., avoidance of problematic drug use and recidivism, stable accommodation, accessing drug dependence treatment, supportive social relationships) will be examined.

Dr Mark Stoove

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Structural and environmental impacts on women's relationships with their children following imprisonment

Connection with family, particularly dependent children is often a key factor in the psychological and social welfare of women in prison and those transitioning from prison to the community. This project will examine structural and environmental factors such as the operation of the Victorian criminal justice and welfare systems and the way these factors impact on women's relationships with their children. The study will involve a desktop review of key policy documents and other 'grey literature' and interviews with key informants to identify systemic barriers and enablers to maintaining connection with children, and how these ultimately impact on the in contact with the criminal justice system.

Professor Margaret Hellard

Head, Centre for Population Health, Burnet Institute

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Professor Hellard’s work has centred around infectious diseases, preventing their transmission and identifying the impact of these infections in vulnerable populations. A researcher and clinician her principal research interests are in the epidemiology of blood-borne viruses (HIV, hepatitis B and hepatitis C), sexually transmitted infections and improving the management of individuals who already have the infection.

She has considerable experience in undertaking community-based research involving young people, injecting drug users (IDUs) and vulnerable populations, and experience in research in tertiary care institutes.

There is growing media interest and public concern about the practices of ‘SEXTing’ and posting of explicit images and text to social media sites among young people.

This project will use data from the Big Day Out project surveys to determine the frequency of such behaviours. Further investigation of the practices will elucidate who engages in SEXTing, who SEXTs are sent to, and the type of content that is shared. It will determine young people’s opinions and attitudes towards SEXTing and sharing of explicit content, and measures they undertake to maintain
control of content and ensure its privacy. These data could be collected from online surveys, in-depth interviews, and thematic analysis of social network pages.

**Professor Margaret Hellard**

Email: [Hellard@burnet.edu.au](mailto:Hellard@burnet.edu.au)

Sex, drugs and rock’n’roll: Young people and risk behaviours in a survey at the Big Day Out music festival

Note: This project is available for mid-year enrolment only.

Sexually transmitted infections (STI) are on the rise among young Victorians. Since 2005, we have surveyed over 9,000 people aged between 16 and 29 years of age at Melbourne’s Big Day Out about sexual risk behaviour and drug use. Questions have covered participant’s sexual histories, condom use, knowledge and perceptions of STIs, and STI testing histories. We ask about alcohol and other drug use, and other risks and behaviours such as diet and exercise, contact with police, mental health, and smoking. The Big Day Out festival also gives us an excellent opportunity to inform this population group about sexual health and behaviour that may place them at risk of sexually transmitted infections. Showbags containing safer sex and other harm reduction information are distributed to survey participants and other Big Day Out patrons.

In this project the student will manage and organise recruitment of participants at the Big Day Out. They will then use the data collected to investigate patterns of sexual risk behaviours, knowledge, and attitudes. This will involve quantitative analysis of the relationship between variables such as condom use, number of sexual partners, drug and alcohol use, and perceptions of risk. These findings, in the context of current public health measures, will be used to advise on the design of future sexual health promotion campaigns.

**Professor Margaret Hellard**

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The feasibility of paying people who inject drugs a modest financial incentive to remain free of hepatitis C (HCV) infections

The predominant blood borne virus (BBV) transmitted through injecting drug risk practices in Australia is hepatitis C (HCV) and it leads to substantial morbidity and mortality in people who develop chronic infection. There are currently no vaccines for these infections, and whilst treatments are improving, prevention of transmission in people who inject drugs (PWID) remains vitally important. Various education and behavioural interventions have been trialled but to date no-one has provided a financial incentive to PWID to remain HCV free.

This project will explore the feasibility of providing a financial incentive to current PWID who have not been exposed to HCV to remain HCV free. It will also explore what would be considered a reasonable incentive to ensure PWID remain HCV free. A series of focus groups and one on one
interviews will be conducted with current PWID, community based organisation representing PWID and relevant government officials.

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Who’s talking about whom? An evaluation of techniques used to match individuals who inject drugs who have named each other in a research study

The Networks Study aims to understand how hepatitis C is transmitted between people who inject drugs (PWID) by modelling the structure of the injecting network. We have collected five years of social network data from PWID including first names, nicknames and some other characteristics of the people with whom participants inject drugs. A number of links have been made between named injecting partners and study participants but some may have been missed and multiple participants may have named the same partners who have not been recruited into the study. This project aims to identify more matches using (a) traditional probabilistic matching techniques, (b) a technique that explicitly accounts for whether the participants have other common injecting partners? What is the influence of the additional matches on the structure of the social network? Is the second technique biased because it assumes social clustering and what are the implications of this for social network analysis?

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Understanding the social structures of relationships between people who inject drugs: a mixed-methods project

We have conducted an empirical study of a drug injecting network and identified a number of social-structural features of that network. Some of these were unexpected: for example, we found that there were many people who reported injecting with two other participants but the two injecting partners did not report injecting with each other (this is surprising because usually there is a high propensity for two people with a friend in common to also be friends). This project would include interviewing networks study participants in more depth about relationships that they have already reported in the past in order to understand some of the structural features. Quantitative methods would be used to identify potential interviewees and describe profiles of people with similar positions in the social network.
A systematic review of the structural features of injecting networks

Hepatitis C and other blood-borne viruses are transmitted through sharing needles and other injecting equipment. These risk behaviours are embedded in social relationships but there is little known about the types and structures of social relationships in which these behaviours take place. A number of empirical studies have been conducted of injecting networks. This study would involve systematic searches of scientific literature in order to identify published empirical injecting networks, characterising common structural features of injecting networks (if these exist), and describing how these injecting networks differ from other types of contact networks.

Why do some people with hepatitis C continue to drink?

Whereas injecting drug use is the most significant risk factor for acquiring hepatitis C (HCV) in the developed world, once infected with HCV, alcohol use is the strongest known modifiable determinant of HCV disease progression. Alcohol consumption has been found to raise the viral load and accelerate hepatic fibrosis in the context of HCV infection, and heavy alcohol consumption is a risk factor for premature death from HCV. Moreover, as well as impacting on liver disease progression, heavy alcohol use may influence the likelihood of successful HCV treatment.

The proposed project involves in-depth interviews with up to 25 consenting participants living with HCV from the Melbourne Injecting Cohort Study (MIX). Interviews will address alcohol use and other related exposures and outcomes, including participants’ alcohol consumption prior to and after HCV diagnosis, any medical advice regarding alcohol consumption they may have received, advice from peers with HCV regarding alcohol consumption, perception of alcohol consumption practices amongst peers with HCV, participants’ understanding of the relationship between alcohol-related and injecting drug use-related behaviours, clinical symptoms and other effects of HCV on relationships and self-perception, current self-management strategies for living with HCV.
Dr Freya Fowkes
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Identifying antigen targets of the acquired immune response during severe malaria

Malaria caused by Plasmodium falciparum is a leading cause of mortality and morbidity globally, particularly among young children. After repeated exposure, individuals develop effective immunity that controls blood-stage parasitaemia, thereby reducing clinical symptoms and life-threatening complications. Antibodies are important mediators of this acquired immunity. The demonstration that naturally acquired antibodies are associated with protection from malaria is one of the criteria used to objectively prioritize malaria antigens for malaria vaccine development.

We have recently completed a case-control study of severe malaria in children living on the North coast of Papua New Guinea. Cases were identified at Madang hospital and were defined as having severe malaria according to the World Health Organization criteria. Each case of severe malaria was matched to a healthy community control. Blood samples were taken from cases at the time of hospital admission and when the patient had recovered. For controls, samples were taken at the time of enrolment into the study. We would like determine levels of antibodies to a range of malaria antigens by Enzyme-linked immunosorbent assay (ELISA), flow cytometry and functional antibody assays. The levels of these antibodies will then be related to clinical outcome using statistical analysis including regression techniques.

These findings will help us understand how immunity contributes to protection from severe malarial disease progression. The findings are valuable for advancing vaccine development by providing evidence supporting certain malaria antigens as targets of protective immunity in humans.

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Investigating the acquisition and maintenance of immunity to malaria in infants and pregnant women

Immunity to infectious diseases during pregnancy remains an intriguing area with immunologic and physiologic changes during pregnancy rendering pregnant women to be more susceptible to, and more severely affected by, infectious diseases. Malaria is one of the most important pathogens in pregnancy and world-wide it is estimated that 50 million women living in malaria endemic areas become pregnant. Despite acquiring substantial pre-existing blood-stage immunity pregnant women typically develop higher parasite densities compared to non-pregnant adults, placental infection and
associated complications. Very little is known about antibody acquisition, maintenance and boosting during or after gestation. Furthermore little is known about maternal transfer of antibodies and subsequent maternal antibody decay and infant antibody acquisition in infants born in malaria endemic areas.

We have samples from several established longitudinal cohorts of pregnant women and infants that can address questions of antibody acquisition and maintenance through antibody assays and epidemiological analyses. Findings will help us understand how immunity develops and is maintained against infectious diseases.

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Immunity, drug efficacy and the spread of anti-malarial drug resistance

Malaria caused by Plasmodium falciparum remains a major cause of morbidity and mortality globally. It is now extremely alarming that resistance to the first-line treatment for falciparum malaria, artemisinin-based combination therapy (ACT), has recently been reported in Asia. The assessment of antimalarial resistance is severely impeded by the presence of host immunity to malaria in patients living in malaria endemic regions. Naturally acquired blood-stage immunity increases the probability of parasite clearance independently of the drugs used, and regardless of their antimalarial resistance. However, the precise immunological targets and mechanisms which enhance antimalarial drug efficacy are unclear. The overall objective of this project is to identify and quantify immunological biomarkers that determine ACT therapeautic efficacy in a malaria endemic area of Thailand, both in the context of clinical disease and malaria transmission.

Laboratory techniques will include ELISA and functional antibody assays. Findings will help assess to what extent immunity in populations can mask the presence of drug resistance and are vital for monitoring the global spread of drug resistance.

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Is the impact of intermittent preventative treatment of malaria in infants (IPTi) dependent on iron status?

One approach to help reduce the burden of malaria caused by Plasmodium falciparum is intermittent preventive treatment (IPT), which involves periodic therapeutic doses of antimalarials to reduce the incidence of malaria and prevalence of anemia. IPT in infants (IPTi) has been shown to decrease malaria episodes by 22%–59% and substantially reduce the prevalence of anemia. However it is not known whether this population-level intervention is dependent on iron status and whether it is more effective in those that are iron replete compared to those that are iron deficient.

Updated July 2012
We have recently completed a randomised controlled trial of 1000 IPT in infants living in Papua New Guinea. The trial included two treatment arms and one placebo arm. Blood samples were taken at the time of IPT/placebo administration. In one of the treatment arms and the placebo arm we would like to measure markers of iron deficiency such as soluble transferrin receptors and ferritin by Enzyme-linked immunosorbent assay (ELISA). The efficacy of IPTi in reducing malaria and anaemia will then be compared in those who are iron replete versus those who are iron deficient. The results of these studies can influence IPT policy in areas of high iron and nutritional deficiencies.

Dr Peter Higgs

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Dr Higgs has a background in community development (BSW, UNSW 1988), having worked with marginalised populations for over 20 years. He studied his MA at Victoria University which focussed on documenting the changes experienced across a group of footpath traders in a small neighbourhood in Hanoi, Vietnam. Peter completed his PhD within the DEPM at Monash University and his thesis was a qualitative study of risks and harms experienced by a group of ethnic Vietnamese heroin users from Footscray. Currently Peter is an NHMRC post-doctoral fellow with the Kirby Institute at the UNSW where he is investigating the risk and protective factors associated with hepatitis C transmission for long term drug injectors.

Low income as a barrier to opioid substitution therapy

People who inject drugs (PWID) often report low levels of income, with many reporting weekly incomes of less than $250. PWID on opioid substation therapy (OST) commonly describe an adverse impact from pharmacy dispensing fees for accessing OST. These fees are typically around $5 per dose, or $35 per week – for many a significant proportion of weekly income, especially after necessary expenditures (rent, food, etc.) are deducted.

This project would involve analysis of data from the Suboxone (a national year-long examination of a particular OST formulation, with a number of cross-sectional arms investigating the health domains of PWID and practices of prescribing pharmacists) and MIX studies (a Melbourne-based prospective cohort study running since 2008 with over 700 PWID as participants), examining the dispensing practice/cost for differing pharmacies, and personal in-depth interviews with PWID to further illicit the impact of dispensing costs and the extent that low income is a barrier to substitution therapy.

Professor Paul Dietze

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Paul is also an ARC Future Fellow, an Honorary NHMRC Senior Research Fellow and VicHealth Public Health Research Fellow.

Updated July 2012
With more than 10 years’ experience in the field he is particularly interested in changing patterns of drug use in Australia and is currently developing a large cohort study of primary heroin and methamphetamine injectors.

Paul also collaborates with researchers from a number of countries on GENACIS, a study of international perspectives on drinking patterns, gender and social roles.

The persistence of risk among people who inject drugs

The prevalence of risk behaviours such as sharing of injecting equipment among people who inject drugs (PWID) has been well described in the Australian context. However, little is known about transitions in risk behaviours among PWID over time and whether Australian PWID moderate their behaviours in response to their changing circumstances. In this study data from the Melbourne Injecting Drug User Cohort Study (MIX) will be examined to determine the extent to which risk behaviours change over time in the cohort and what impact any changes have on key health outcomes such as blood borne virus transmission.

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**Alcohol health promotion using mobile phones**

Binge drinking is a serious and common problem among Australian youth. Novel methods of health promotion are urgently needed to address this problem. This project is a scoping study investigating the potential uses of and acceptability of various health promotion approaches to binge drinking, including mobile phone SMS and smart phone apps.

The project will involve a mixed methods approach working with young people. The project will begin by scoping and evaluating existing health promotion interventions using smart phones. Studies will include quantitative methods - for example, online surveys and analysis of existing data. Qualitative methods including focus groups and in-depth interviews with young people will also be applied. The project could lead to or include the development of a smart phone app and testing of health promotion messages to be sent via SMS.

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**Street drinking in Footscray**

Public alcohol consumption is a major issue in many local communities. The Footscray Central Business District has been identified as a site in the City of Maribyrnong with public drinking issues, with pockets of drinkers identified across different parts of the CBD. This study will involve structured observation of the Footscray CBD along with interviews with in-depth
interviews with public drinkers about their experiences of drinking and choices of drinking locations.

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Mapping public injecting drug use in urban Melbourne

The risks associated with injecting drug use are determined by interactions between individual injecting behaviours and the ‘environment’ (e.g., physical, social, legislative) in which injecting occurs. Using a mixed methods approach, this project will undertake ethnographic mapping and quantitative secondary data analysis to document aspects of public injecting drug use in inner urban Melbourne. The ethnographic mapping exercise will involve neighbourhood-level observational research to examine sites of public injecting, levels of public injecting and document associated injecting practices and potential risks. Additional secondary data analysis will be undertaken to examine indicators of the impacts of public injecting, such as fatal and non-fatal overdose and impacts on public amenity.