The Alfred Medical Research and Education Precinct – AMREP – was established in 2002 as a partnership between Alfred Health, Monash University, Baker IDI Heart and Diabetes Institute and the Burnet Institute. La Trobe University and Deakin University joined the partnership in 2005.

AMREP is located on the campus of The Alfred hospital, Melbourne. At AMREP are:
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Since my last report, the benefits of Academic Health Science Centres have become widely discussed in Australian health and medical research organisations. The development of a virtuous spiral of healthcare delivery, education of clinical professionals and clinical research all enhancing each other to the benefit of patient care and clinical outcomes is starting to influence the way in which groups of organisations relate to each other to have an impact on the health of a population.

AMREP, established in 2002, is Australia’s first and longest existing example of such an endeavour, although when created no one at the time would have thought – Academic Health Centre. Although of long standing, high quality and successful in many ways, on a world stage AMREP remains relatively small when considering patient volumes, research funding and outputs. Over the last six months, a larger collaboration has begun to emerge. The collaboration between AMREP and Monash Health Translation Precinct brings together Alfred Health with Southern Health, Monash University, Baker IDI Heart and Diabetes Institute, Burnet Institute, Prince Henry’s Institute, Cabrini Health and Epworth with their education and research institutes. This group will be the largest such grouping in Australia and is well equipped to be recognised for its clinical service, research and education activities on a world stage. The partnership will grow to include primary care and other education partners as it develops.

Within the AMREP family, we will continue to make a strong and often leading contribution to the emerging themes of this new organisation, with particular emphasis on

- Heart disease and diabetes
- Infectious diseases and immunity
- Blood diseases and cancer
- Trauma and critical care
- Older people and rehabilitation

The AMREP Council will continue to promote and coordinate activities on our Commercial Road campus, and to that end I am delighted to welcome Professor Stephen Jane as Director of Research for Alfred Health and Head of the Central Clinical School for Monash University.

This year has seen three major grant awards funded from The Alfred Research Trusts, each to a maximum of $500,000. I am delighted we attracted such high quality applications, and look forward to hearing the results of these awards made to Professor Peter Cameron in Emergency, Professor Paul Fitzgerald in the Monash Alfred Psychiatry Research Centre, Associate Professor Andrew Davies in Intensive Care and their respective research teams.

In 2010, AMREP’s external competitive research revenue increased to almost $95 million from $90.9 million in 2009. Of this, half came from the National Health and Medical Research Council (NHMRC) and the US National Institutes of Health. The number of publications (referred journal articles, book chapters and books) rose from 1171 in 2009 to 1463 in 2010. Both research revenue and publication numbers have trebled since AMREP’s establishment in 2002.

AMREP researchers were successful in gaining almost $44.8 million in new direct NHMRC grant funding commencing in 2011. The major highlight was an unprecedented 57 new Project Grants totalling $35.3 million, several with budgets well in excess of $1 million. This level of Project Grant funding placed AMREP fourth highest in Australia for the 2010 funding round. Our early career scientists secured salary awards in a highly competitive environment, with seven new Career Development Fellowships and three Early Career (Postdoctoral) Fellowships, including the highest ranked nationally (awarded to Dr Pamela Davern of Baker IDI).

A further funding highlight announced in March was a $1.5 million NHMRC Partnership Projects Grant awarded to Professor Sharon Lewin (The Alfred Infectious Diseases Unit and Burnet Institute) to undertake a trial of interactive self-care plans to prevent and manage chronic conditions in people living with HIV. Recently, Professor Lewin was one of a group of seven of the world’s best HIV researchers (and the only Australian) to be awarded a $20 million grant by the US National Institutes of Health to find a cure for HIV.

Several AMREP staff and affiliates were recognised for outstanding contributions to their respective fields in this year’s Australia Day and Queen’s Birthday Honours. Those honoured were:

- Professor Hatem Salem, Member of the Order of Australia (AM)
- Professor Gregory Snell, Medal of the Order of Australia (OAM)
- Professor Jeffrey Rosenfeld, Member of the Order of Australia (AM)
- Professor Suzanne Crowe, Member of the Order of Australia (AM)
- Professor Andrew Tonkin, Medal of the Order of Australia (OAM)
- Alastair Lucas, Chair of Burnet Institute Board of Directors, Member of the Order of Australia (AM)
- Natasha Stott Despoja, member of Burnet Institute Board of Directors, Member of the Order of Australia (AM)

Alfred Health recently achieved membership with the World Health Organization’s International Network of Health Promoting Hospitals and Health Services. This status recognises the health service’s achievements to date, as well as its commitment to future health efforts.
Kristan Corben has been appointed as Lead for Population Health and Health Promotion to facilitate the integration of a health promotion philosophy throughout the organisation.

The Minister for Mental Health and Ageing, the Hon. Mark Butler, opened Baker IDI’s Healthy Lifestyle Research Centre in November 2010. The centre, supported by the Commonwealth Government, will develop health programs that will prevent, manage and treat obesity, diabetes and cardiovascular disease.

Internationally-recognised teams at CSIRO and Baker IDI collaborated to produce The CSIRO and Baker IDI Diabetes and Lifestyle Plan, launched in May 2011. The book offers comprehensive plans to support a healthy lifestyle and covers every aspect of diabetes prevention and control. Features include exercise plans to increase physical activity, practical assistance for smart shopping and tips for healthy food choices when eating out, as well as recipes for creating healthy meals.

Promotion of Research at AMREP

The annual Alfred Week Research Poster Display, held each October for many years, showcases research carried out across AMREP. The 2010 display attracted 175 posters and generous prizes were awarded for those posters judged to be the best in their category. Thanks are extended to our prize sponsors, as well as to the many AMREP staff who judged the poster prizes. Details of the winning posters are in the back section of this report.

At the award ceremony, Melbourne Health Executive Director of Research, Professor Ingrid Winship, delivered a stimulating keynote address entitled ‘The future of clinical research in Victorian hospitals’, and followed by presenting the 2010 AMREP Research Prize to Associate Professor Andrew Davies (Intensive Care Unit, The Alfred). This annual prize is awarded to the AMREP first or senior author whose original research paper was published in the previous year in the journal with the highest impact factor. Dr Davies’s article entitled ‘Extracorporeal membrane oxygenation for 2009 influenza A (H1N1) acute respiratory distress syndrome’ was published in the Journal of the American Medical Association (impact factor: 30.718).

AMREP Honours Scholarships

The AMREP Honours Scholarships scheme, implemented three years ago, was devised to attract outstanding Science and Biomedical Science students to undertake their Honours year at AMREP. The scholarship recipients for 2011 were Jodie Abramovitch (Monash Department of Immunology) and Elyse Di Marco (Baker IDI). Photographs of Jodie and Elyse are on page 95 of this report.

Finally, I would like to place on record my thanks to our two very dedicated support teams in the research office and the ethics office, without whom much of what AMREP achieves would not be possible.

The AMREP Council

The AMREP Council has a major governance role in providing the infrastructure and environment in which research at AMREP can flourish.

Members

Andrew Way (Chair)
Alfred Health

Professor Stephen Jane
Alfred Health

Professor Steve Wesselingh
Monash University

Professor Hatem Salem
Monash University

Professor Garry Jennings
Baker IDI Heart and Diabetes Institute

Hilary Bolton
Baker IDI Heart and Diabetes Institute

Professor Brendan Crabb
Burnet Institute

Professor Mark Hogarth
Burnet Institute

Professor Mari Botti
Deakin University

Professor Karen Dodd
La Trobe University

Dr Lee Hamley
Chief Medical Officer, Alfred Health

Associate Professor Sharon Donovan/Janet Weir-Phyland
Chief Nursing Officer, Alfred Health

Professor John McNeil
Chair, The Alfred Human Research Ethics Committee

Dr Andrew Giddy
Chair, AMREP Animal Ethics GAP Committee

Professor Mark Cooper
Chair, AMREP Scientific Advisory Committee

In attendance

Heather Gallichio (Secretary)
General Manager, Alfred & Baker IDI Research Office

Bill O’Shea
Alfred Health Corporate Counsel

Geoff McDonald
Director, Capital and Infrastructure, Alfred Health
In 2010, AMREP researchers published original research articles in top-ranking international journals including:

- *New England Journal of Medicine* [IF: 53.484]
- *Nature Genetics* [IF: 36.377]
- *Nature* [IF: 36.101]
- *The Lancet* [IF: 33.633]
- *Cell* [IF: 32.401]
- *Journal of the American Medical Association* [IF: 30.011]

The average impact factor of all journal articles published in 2010 was 4.298. 25.1% of all articles were published in journals with an impact factor of $\geq 5$. *Note: 2010 impact factors.*

For a complete list of publications by AMREP staff in 2010, see page 107 of this report.

**Higher degree completions**

- 34 PhD completions
- 4 Other doctoral completions
- 130 Masters completions

In 2010, there were 324 PhD and 50 other doctoral at AMREP.

For details of all current doctoral students in 2010, see page 96 of this report.
External research funding includes funds received from peer reviewed funding schemes (e.g. NHMRC, National Heart Foundation, NIH), other government grants (e.g. Department of Human Services), industry and university grants. Funds received from commercially sponsored clinical trials/contract research are not included.

Commercially sponsored clinical trial income

Publications

Abstracts, conference proceedings and 'in press' articles are not included.

Completed and passed higher degrees

Masters Doctoral
Clinical Registries

AMREP has become home to the largest concentration of clinical registries in Australia. At present over 20 major registries are located on site, mainly within the Centre of Research Excellence in Patient Safety (CREPS). CREPS was established as an NHMRC Centre within the Monash University School of Public Health and Preventive Medicine (SPHPM) to provide national leadership and research into the measurement of quality of care.

Registries provide measurement and benchmarking of the outcomes of high significance clinical procedures. They are also used to monitor the safety of new drugs, devices and surgical procedures. New registries currently under development at AMREP include lung cancer, cardiac procedures, major transfusion and breast implants.

Clinical registries collect an identical minimum data set from patients treated at participating hospitals. Outcomes of treatment are also measured in a systematic way using identical definitions. The data is fed back to clinical teams to allow their performance to be measured against other units, nationally and internationally.

Some registries also collect details of treatment allowing the measurement of compliance with treatment guidelines and exploring variations in care which are still prevalent, even for common conditions such as prostate cancer.

Professor John McNeil, Head of SPHPM, says that one reason for the School’s national role in registry development is its data centre. This provides a unique capacity to handle large clinical data sets involving thousands of patients with high security, which is matched by only one or two other units in Australia.

In addition, CREPS has become a leader in registry science, focusing on areas such as risk adjustment, registry governance and funding models. The unit worked closely with the National Commission for Safety and Quality of Healthcare to develop national guidelines for registries which have now been widely adopted throughout Australia.

The School’s registry program has provided an excellent example of collaboration between Monash SPHPM and clinical units within The Alfred hospital. Professor McNeil says, “Registries rely on a combination of clinical and research skills. Several senior Alfred clinicians including Jeremy Millar (prostate cancer), Peter Cameron (trauma, burns) and Robert Stirling (lung cancer) work with the School’s clinical epidemiologists, biostatisticians and data management staff to provide clinical leadership of each individual registry."

Professor Peter Cameron says, “The registries provide a great example of how specialised skills within the university and the hospital can produce a high profile national program. The registries will also provide the campus with a clinical research resource unique to the campus.”

Registries managed include:
• Australian Society of Cardiac and Thoracic Surgeons (ASCTS) Database
• Australian Rheumatology Association Database (ARAD)
• Bosentan Patient Registry
• Haemostasis Registry
• Melbourne Interventional Group (MIG) Interventional Cardiology Registry
• REduction of Atherothombosis for Continued Health (REACH) Registry
• Population-based prostate cancer clinical registry
• Surveillance of Australian workplace Based Respiratory Events (SABRE)
• Victorian Cardiac Arrest Registry
• Victoria Lung Cancer Registry
• Victorian Orthopaedic Trauma Outcomes Registry (VOTOR)
• Victorian State Trauma Outcomes Registry (VSTORM)

For more information, visit www.med.monash.edu.au/epidemiology/research/registries.html
The Healthy Lifestyle Research Centre at Baker IDI

In a bid to combat the epidemic of obesity and diabetes as well as subsequent development of heart and vascular disease, Baker IDI opened the Healthy Lifestyle Research Centre (on level 4 of the Alfred Centre) in May 2010.

The Healthy Lifestyle Research Centre’s research program encompasses physical activity and nutrition underpinned by basic and clinical physiology. A principal aim is development of evidence-based, sustainable, interventions to combat obesity and its consequences.

Physical Activity Research

The physical activity program builds on a strong Baker IDI track record in research underpinning national and international exercise guidelines. More recently, time spent sitting has been identified as an independent risk factor for metabolic and vascular disease. The centre has a comprehensive program focused on sedentary behaviour reduction, including understanding mechanisms and development and evaluation of sustainable interventions to reduce sedentary time.

Nutrition Research

Diet and nutrition are important factors in the promotion and maintenance of good health throughout life. Their role as determinants of chronic non-communicable diseases is well established and consequently, they occupy a prominent position in prevention activities.

Lifestyle modification is the cornerstone of treating and preventing diseases of obesity. The nutrition program will examine and endeavour to optimise diets for people with obesity, cardiovascular disease, insulin resistance and Type 2 diabetes.

Access

Enquiries about accessing facilities at the Healthy Lifestyle Research Centre should be directed to Professor Bronwyn Kingwell (bronwyn.kingwell@bakeridi.edu.au).

Ian Potter Library

The Ian Potter Library provides a single integrated library and information service to staff and students of AMREP. Acting as the hub of the Alfred Health Library Service, the Ian Potter Library also supports the local library services at Caulfield Hospital and Sandringham Hospital.

The library organises its information resources to support patient care, educational training and research activities of the AMREP institutions. Supporting research is a major focus for the library, and keeping abreast of new research programs and developments is important. With representatives of all the AMREP institutions, the Library Advisory Committee advises on information services and resources required by research scientists and students. Key resources include access to full-text electronic journals, bibliographical databases in biomedicine, technical monographs, specialist reference texts and overseas document requests.

The trend towards replacing library print journal subscriptions with online-only journal subscriptions continued apace in 2010. Library subscriptions from publishers Elsevier, Nature, Springer and Wiley experienced a major change. At the same time, the library was able to generally expand access to the range of titles offered by these important scientific publishers. With online archival access to journal content locked-in, it is possible to consider disposing of back-runs of print journals when extra library shelving space is required. Full-text article downloads from library resources totalled 167,000 in 2010.

The library teamed up with research staff from National Information and Communications Technology Australia (NICTA) based at the University of Melbourne, and RMIT University’s Department of Computer Science, to conduct a study titled ‘Improving Tools for Searching Medical Literature’. The library asked for volunteers to participate in testing a variety of online search systems, which would gather data on the efficiency of database searching models.

The library provides a busy schedule of training classes for library users. The most popular training classes in 2010 were for EndNote and Medline. The library also provided classes for EMBASE, CINAHL, Cochrane Library and general library orientation. There were 151 training classes conducted, which provided training to 469 people.
Monash Micro Imaging at AMREP (MMI@AMREP)

Monash Micro Imaging at AMREP manages core imaging resources within Baker IDI Heart and Diabetes Institute, Monash University Central Clinical School and the Burnet Cell Imaging Facility. Stephen Cody coordinates and facilitates microscopy developments, and is responsible for microscopy training and research support.

Currently, MMI@AMREP manages three confocal and several conventional fluorescence microscopes within PC2 laboratories. There is also a dedicated deconvolution microscope within a PC3 laboratory forming part of the Burnet Cell Imaging Facility. MMI@AMREP staff are available to help with experimental design, and techniques such as: live and fixed cell imaging, time-lapse, 3D, high resolution of large areas, fluorescence, brightfield, phase, DIC, ion imaging such as Ca\textsuperscript{2+} and pH.

Training on microscopes is conducted on request and is usually coupled with a discussion on the imaging requirements of the research project. This ensures that the training is targeted to the needs of the project, and that the experimental design is appropriate. Training seminars and workshops are also conducted to help broaden the understanding of imaging. MMI@AMREP staff are keen to assist when purchasing a new microscope, ensuring researchers order the right technology to suit their needs and have expertise in negotiating discounted pricing.

Contact Stephen Cody (stephen.cody@monash.edu) for microscopy related issues, including training, research support, instrument demonstrations and promotions, and new technology, or visit www.microimaging.monash.org

Burnet ImmunoMonitoring Facility

The Burnet ImmunoMonitoring Facility (IMF) is a certified NATA Research and Development (R&D) accredited facility. Under the direction of Associate Professor Rosemary Ffrench, the facility develops optimised and validated immunological assays for clinical trials and pre-clinical research compliant to ISO/AS17025. The development of vaccines and immunotherapies requires the sophisticated assessment of immune responses in both animals and in human clinical trials. Cell-mediated immunity is a key biomarker for most vaccines and immunotherapies and involves the activity of specialised cells including macrophages, dendritic cells, natural killer cells, antigen-specific cytotoxic T-lymphocytes, helper T-lymphocytes and the release of various cytokines in response to antigen stimulation.

The Burnet IMF aims to support both internal and external research in vaccine development by conducting and validating relevant immunological assays to Good Laboratory Practice standards. Increasingly, regulatory authorities request that assays showing markers of vaccine efficacy are robust and standardised. These assays are often difficult to complete and require a high level of operator skill and specialised equipment.

Analysis of the biological samples is performed using the following appropriately validated analytical techniques and processes: isolation and cryopreservation of mononuclear cells, plasma and serum; ELISpot assays; multiplex bead array systems; ELISA; neutralisation activity assays; phagocytic function and oxidative burst activity analysis.

Enquiries about the Burnet IMF should be directed to Associate Professor Rose Ffrench, Facility Director (ffrench@burnet.edu.au) or Kylie Goy, Facility Coordinator (kgoy@burnet.edu.au).
Dr Alexandra Ziegler utilises the LSR II, one of AMREP’s most advanced cell analysers.

**Omnics (DNA and Blood Profiling)**

The DNA and Blood Profiling Facility at Baker IDI has a systems biology theme integrating the genomics, epigenomics, metabolomics and proteomics laboratories with the bioinformatics group.

The facility contains state-of-the-art instruments, including the Illumina Genome Analyzer II (next generation sequencing) and iSCAN System (gene expression microarrays), the Sequenom MassArray for genotyping, as well as a number of specialised mass spectrometers for lipids profiling, peptide mass fingerprinting, biomolecule separation and protein profiling. The team also offers bioinformatics support for the relevant platforms and offers Sanger/capillary DNA sequencing as a regular service.

For more information on the platforms available and the services offered, contact Dr Farhad Shafiei (farhad.shafiei@bakeridi.edu.au), or visit www.bakeridi.edu.au/core_facilities/OMICS/

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**Mouse Metabolic Phenotyping**

Devising new therapies to combat obesity is challenging due to the complex nature of metabolic disease, which involves the interaction between genetics and the environment. Mice provide an essential model for studying metabolic disorders since the whole mouse genome has been sequenced and candidate genes for coronary disease, cardiomyopathy, diabetes, obesity and other disorders of metabolism have been identified. Transgenic technology and gene targeting protocols have allowed researchers to create new mouse lines with specific phenotypes and well-defined DNA structural changes that enable diseases of metabolism to be better understood.

The Mouse Metabolic Phenotyping Facility at Baker IDI Heart and Diabetes Institute was established to provide services to scientists using mice to study obesity, diabetes, cardiovascular disease and other metabolic diseases. Using state-of-the-art tools and methods, the facility provides sophisticated, standardised, high quality metabolic and physiologic phenotyping services for rodent models of obesity, diabetes and related disorders. This service enables scientists to identify and study new mouse models of complex metabolic diseases. By manipulating candidate genes in mice, scientists will gain a better understanding of the genetic origins of obesity and related diseases, and the effects of different environmental factors.

For more information, contact Professor Mark Febbraio (mark.febbraio@bakeridi.edu.au) or Dr Clinton Bruce (clinton.bruce@bakeridi.edu.au).

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**Flow Cytometry**

The AMREP Flow Cytometry Facility is a state-of-the-art, world class cell sorting and cell analysis laboratory, catering for the scientific research community based at AMREP and broader Melbourne. The facility is located in the Monash Department of Immunology, with some instruments located within the Burnet Institute.

The Flow Cytometry Facility offers comprehensive training and education, experimental design and protocol guidance specifically targeting effective data generation and interpretation. Services catering for both animal and human cell sorting in a PC2 environment are offered. The facility can also handle infectious sample sorting (e.g. HIV, Hepatitis C) in a dedicated PC3 environment, which is unique to Melbourne. The facility offers two FACSAria high throughput sorting platforms and five flow cytometers: an LSR II, a FACSCanto II with a 96-well High Throughput Sampler and three FACSCalibur units.

For more information on the platforms available and the services offered, contact the Manager of the facility, Geza Paukovics (paukovic@burnet.edu.au) or Assistant Manager Michael Thomson (thomson@burnet.edu.au), or visit www.amrepflow.org.au

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Dr Farhad Shafiei uses the Sequenom MassArray.
Ethics Committee

Applications
The Ethics Committee received 400 research projects for review in 2010. Of these, 98 were health and social sciences applications, 115 drugs and interventions applications and 187 ‘low risk’ applications, which pose such little risk to participants that they do not need to be reviewed by the full Ethics Committee.

Streamlined Review
Eighteen applications were submitted to the Ethics Committee for review under the new Victorian Government Streamlined Ethical Review Program (SERP). Nineteen SERP projects to be conducted at Alfred Health and reviewed by another certified human research ethics committee (HREC) were authorised for commencement at The Alfred. SERP was developed with the expectation that the time for ethics approval will be reduced and research will commence more quickly than under the previous system where applications were reviewed by the HREC of each study site.

HoMER
The committee also took part in a trust building pilot for the NHMRC’s national initiative to streamline the ethical review of multicentre research – HoMER (Harmonisation of Multicentre Ethical Review). The pilot was designed to demonstrate the potential for a single review process, and to encourage confidence in the review of other HRECs. This HREC participated both as a ‘reviewing’ and an ‘accepting’ site. HRECs wanting to be part of HoMER will undergo certification to provide a single ethical review for research that may be conducted in different states of Australia.

First-time-in-human Applications
Eight first-time-in-human applications were reviewed and included:
- a new drug to stimulate neutrophil production, which may shorten the duration and reduce the severity of neutropenia after chemotherapy
- a new drug to treat secondary hyperparathyroidism (excessive secretion of parathyroid hormone) in patients who have chronic kidney failure
- an experimental compound being investigated for its potential to regulate airway smooth muscle, which may help in the treatment of patients with asthma
- a new protein developed to treat sensitivity to cat allergens

General Ethical Issues Sub-committee

The General Ethical Issues Sub-committee (GEI S-C) provides a forum within Alfred Health for the discussion of a wide range of ethical issues: internal matters relating to human research and health care more generally, as well as externally initiated enquiries such as government reviews. The sub-committee met ten times in 2010.

Ethical Issues in Human Research

Research that potentially involves legal risks for participants and researchers
Research that intends, or is likely, to collect information about someone’s involvement in illegal activities needs to be designed and conducted with the associated risks in mind. Guidelines were developed in consultation with a range of stakeholders including ethics committee members, researchers from Alfred Health and the Burnet Institute, and Alfred Health legal counsel.

www.alfredresearch.org/ethics/ecguidelines.htm

Accurate information for research participants
A cornerstone of ethical research is informed consent, and participants need clear and accurate information to make an informed decision. The wording in the standard Participant Information and Consent Form templates is periodically reviewed and updated, in step with changing community standards, institutional requirements, laws, etc.

In 2010, the sub-committee focused on the clauses describing:
- (a) compensation for injury sustained through research participation
- (b) limitations to the confidentiality of participants’ information

Both relevant clauses have been revised, trialled and implemented.

Other research-related issues included:
- Research conducted in private practice settings
- Witnessing a person’s consent to participate in research – what is required?
- Informing GPs about their patients’ participation in research
- Evaluating research projects involving complementary and alternative medicines
- Intellectual property and student researchers

Wider Institutional Ethical Issues
- Educational/promotional activities conducted by pharmaceutical companies which involve the collection of hospital information
- Clinical ethics services and the service at Alfred Health

Public Consultations

Victorian Law Reform Commission’s Enquiry into the Guardianship and Administration Act 1986
The Guardianship and Administration Act provides for medical research to be undertaken with adult participants who are unable to give informed consent because of a temporary or long term impairment. However, the Act’s research provisions can make certain kinds of research difficult to undertake. The GEI S-C made a submission to the VLRC Enquiry in 2010 and has been closely involved in the subsequent consultation process.

Other public enquiries included:
- NHMRC/AHEC – development of a draft Process Chart to identify quality assurance activities requiring ethical review (submission made)
- Department of Health review of the Mental Health Act 1988 (no submission made)
**HREC MEMBERSHIP**

**Ethics Committee**
Professor John McNeil (Chair)
Professor Colin Johnston (Deputy Chair, Drugs and Interventions Group; member with knowledge of relevant research areas)
Roy Olliff (Chair, Health and Social Science Group)
Professor Mari Botti (Deputy Chair, Health and Social Science Group; nursing representative)
Dr Sharon Avery (member with knowledge of professional care and treatment – from February 2011)
Emily Bingle (laywoman – to December 2010)
Elizabeth Burns (laywoman)
Dr Catherine Cherry (member with knowledge of professional care and treatment)
Simon Cohen (lawyer)
Brad Crammond (member with knowledge of relevant research areas – to December 2010)
Dr Peter Douglas (layman; member with experience in analysing ethical decision-making – from January 2011)
Dr Judith Frayne (member with knowledge of professional care and treatment)
Peter Gallagher (layman)
Samantha Gault (laywoman)
A/Professor Richard Gerraty (member with knowledge of relevant research areas)
Reverend Sam Goodes (minister of religion)
Linton Harriss (member with knowledge of relevant research areas)
Reverend Marilyn Hope (minister of religion)
Linda Hornsey (laywoman)
A/Professor David Hunt (member with knowledge of relevant research areas)
A/Professor Peter Hunter (member with knowledge of relevant research areas – from August 2010)
Dr Michael Hurley (member with knowledge of professional care and treatment)
Professor Henry Krum (member with knowledge of relevant research areas)
Jim Mahoney (lawyer)
Maria McKenzie (member with knowledge of relevant research areas)
Stephen Moloney (lawyer)
Fr Ian Morrison (minister of religion)
Linda Murdoch (lawyer – from February 2011)
Shefton Parker (member with knowledge of relevant research areas)
Dr James Shaw (member with knowledge of relevant research areas)
Dr Michael Ward (member with knowledge of professional care and treatment – from November 2010)
Michael Wildenauer (layman)
Dr Fran Wise (Caulfield Hospital representative; member with knowledge of professional care and treatment – to May 2010)
David Zarfaty (layman)
Paul Zawa (lawyer – to December 2010)
Rowan Frew (Secretary)
Dr Angela Henjak (Assistant to Secretary – Drugs and Interventions Group)
Nicole Rosenow (Assistant to Secretary – Drugs and Interventions Group)
Kordula Dunscombe (Secretary – Health and Social Science Group)
Anna Parker (Secretary – Health and Social Science Group)
Tracey Scheller (Ethics Officer – Low Risk applications, Progress Reporting)

**General Ethical Issues Sub-committee**
Professor John McNeil (Chair)
Professor Paul Komesaroff (Deputy Chair)
Dr Susannah Ahern (Medical Administration representative – to November 2010)
Marta Ago
Dr Tracey Caulfield (to September 2010)
Simon Cohen
Brad Crammond (to December 2010)
Reverend Marilyn Hope
A/Professor Peter Hunter (Caulfield Hospital representative – from April 2010)
Peter Gallagher
Dr Cate Kelly (Medical Administration representative – from February 2011)
Dr Phoebe Mainland
Dr Roderick McRae
Elizabeth Mullaly (Caulfield Hospital representative)
Janine Roney
Professor Alison Street (to February 2011)
Dr Tim Sutton (to July 2010)
Professor John Wilson
Michelle Wright
Kordula Dunscombe (Secretary)
Rowan Frew (Ethics Manager)

**Research Review Committee**
Professor Colin Johnston (Chair)
Dr Sharon Avery
Dr Catherine Cherry
Dr Andrew Davies
Dr Amanda Davis
Dr Judith Frayne
A/Professor Richard Gerraty
Dr Andrew Haydon
Dr William Kemp
Professor Henry Krum
Anne Mak
Professor John McNeil
Dr James Shaw
Dr Alan Young (to August 2010)
Rowan Frew (Secretary)
Dr Angela Henjak (Assistant to Secretary)
Nicole Rosenow (Assistant to Secretary)

**Low Risk Sub-committee**
Maria McKenzie (Chair)
The low risk process was changed at the start of 2010 to an out-of-session process involving review by individual Ethics Committee members overseen by the Chair and without meetings or a sub-committee.

HUMAN RESEARCH ETHICS COMMITTEE MEMBERSHIP
The AMREP Animal Ethics Committee (AEC) assesses all proposals using animals for scientific purposes from the Baker IDI Heart and Diabetes Institute, Burnet Institute, Monash University Central Clinical School and The Alfred. The AEC decides, on ethical grounds, whether the proposal to use animals is justified, and whether the welfare of the animals will be adequately protected. For animal use to be justified, the AEC must be convinced that the benefits from the use outweigh the potential costs to the animal. As such, the AEC is at the interface between the scientist and the wider community.

The AMREP AEC must also ensure that all animal use for scientific purposes on the precinct complies with the NHMRC Australian Code of Practice for the Care and Use of Animals for Scientific (The Code), which sets out the responsibilities of investigators, institutions and AECs regarding the use of animals.

Applications in 2010
One hundred and twenty-six new experimental proposals were reviewed by the AMREP AEC. Many of the applications received were complex and innovative. The animals used were principally mice and rats, but a small number of rabbits, ducks and dogs were also used.

<table>
<thead>
<tr>
<th>Application type</th>
<th>Baker IDI</th>
<th>Monash CCS</th>
<th>Burnet Institute</th>
<th>Alfred Health</th>
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<tr>
<td>New experimental</td>
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<td>35</td>
<td>8</td>
<td>2</td>
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<td>Modifications</td>
<td>60</td>
<td>28</td>
<td>10</td>
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<td>Colony</td>
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<td>12</td>
<td>16</td>
<td>0</td>
</tr>
<tr>
<td>Antibody</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Animal Ethics Committees
To manage the large number of applications, there are two AECs in operation at AMREP. Each review committee meets on a monthly basis, with meetings staggered by two weeks. For consistency and efficiency, modifications and other project specific documentation relating to an approved project are reviewed by the same committee as reviewed the original application. The Chair, Animal Welfare Officer and a member of animal care staff attend all meetings to maintain uniformity across the committees.

The AMREP Animal Ethics Governance and Policy (GAP) Committee was formed in 2010 to provide governance and policy across both review committees and to assist the licence holders in meeting their obligations under The Code. In 2010, the GAP Committee focused on improving the quality of submissions to the AEC by introducing a pre-review process conducted by the AEC Chair. This process helped improve consistency and encourage the use of lay language in applications. AEC interviews with investigators were also introduced to explain experimental details where necessary. A review of process timelines by the GAP Committee showed that these initiatives resulted in a 60% improvement to animal ethics application approval times.

Standard Operating Procedures
A Standard Operating Procedure (SOP) is a detailed description of a standardised procedure. Using an SOP can allow researchers to reuse the description of a routine procedure in ethics applications and may save the AEC time in approving well-established procedures. A review and update of the library of Standard Operating Procedures commenced in 2010.

Communication
A GAP Committee Newsletter was established in 2010 to convey critical aspects of AEC activity and policy to researchers. A new Animal Ethics website amrepaecc.bakeridi.edu.au was launched to assist investigators with locating animal ethics resources.

Training
Following the Bureau of Animal Welfare’s recommendation, the GAP Committee implemented a training program in animal ethics legislation and animal welfare requirements for researchers. All active animal users are required to attend one training session each year. The training consists of a 1-hour refresher program for laboratory heads whose staff use animals and a comprehensive 3-hour training session for active animal users.

AMREP AEC Membership
Dr Alana Mitchell (Chair)
Dr Mandy Errington (Veterinarian)
Dr Kay Juliff (Veterinarian)
Dr Lucy Uren (Veterinarian)
Dr Clinton Bruce (Scientist)
Dr Judy de Haan (Scientist)
Dr Margaret Hibbs (Scientist)
Dr Ian Burns (Animal welfare)
Dr Alan Sherlock (Animal welfare)
Robyn Sullivan (Animal welfare)
Noel Ancell (Lay member)
Jim Gigas (Lay member)
Ashley Wolff (Lay member)
Debra Ramsey (Animal Care/Facility Manager)
David Spiteri (Animal Care)
Leia Demtschyna (Secretary)

AMREP Animal Ethics Governance and Policy (GAP) Committee Membership
Dr Andrew Giddy (Chair)
Patricia Baitz (Lay member)
Dr Mandy Errington (Veterinarian)
Heather Gallicchio (General Manager, Research Office)
Professor Stephen Jane (Licence Holder Nominee)
Professor Fabienne Mackay (Scientist)
Dr Alana Mitchell (Chair, AMREP AEC)
Debbie Ramsey (Animal Care/Facility Manager)
Robyn Sullivan (Animal welfare)
Leia Demtschyna (Secretary)
AMREP RESEARCH PROGRAMS
Allergy, Immunology and Respiratory Medicine (AIRmed) has a comprehensive spectrum of expertise covering advanced adult lung diseases, clinical and basic allergy, and non-HIV clinical immunology. Specific disciplines include allergic diseases, severe asthma, primary and acquired immune deficiencies, chronic obstructive pulmonary disease, interstitial lung diseases, sleep apnoea and sleep disordered breathing, cystic fibrosis (CF), bronchiectasis, pulmonary vascular disease and adult and paediatric lung transplantation programs.

AIRmed integrates clinical services with extensive human and experimental research programs, linking senior clinician scientists, bench scientists, allied health professionals, primary care physicians and the community.

Clinically driven hypotheses direct the laboratory-based human research and subsequent translation into changes in current best practice for improved health outcomes. The clinical and academic base of AIRmed is located at The Alfred hospital, with experimental and clinical research laboratories located within The Alfred and in the laboratories of Monash University at AMREP.

AIRmed has a very active clinical and biomedical research focus with considerable success in competitive NHMRC, ARC, Cooperative Research Centre and other research grant funding. High international and national profiles of senior personnel are reflected in roles on editorial boards of the highest discipline-specific international journals, committee memberships, numerous peer review publications and speaking invitations.

AIRmed is committed to delivering outstanding best practice clinical care, outcome driven professional education and community outreach, as well as translational research of international acclaim.

**Departmental Highlights**

- Greg Snell was awarded a Medal of the Order of Australia in 2011 for service to medicine in the field of respiratory science, to education and to professional organisations.
- Bruce Thompson, Frank Thien, Jo Douglass, Greg King (Woolcock Institute Sydney) and Robyn O’Hehir were awarded an NHMRC Project Grant to research the physiological aetiology of refractory asthma.
- Robyn O’Hehir and Jennifer Rolland (Monash Immunology) were awarded an NHMRC Project Grant to progress their research identifying a human CD4+ T-cell epitope based therapeutic for peanut allergy.
- Michael Abramson, Shyamali Dharmage, Geza Benke and Bruce Thompson were awarded an NHMRC Project Grant for their research ‘Third Euro-Australian Respiratory Health Survey’.
- Magdalena Plebanski (Monash Immunology), Robyn O’Hehir, James Friend (Monash Engineering), Jennifer Rolland and Charles Hardy (Monash Immunology) were awarded an NHMRC Project Grant to further their research into the mechanisms of nanoparticle mediated inhibition of asthma.
- Faizel Hartley, Christopher Stuart-Andrews, Brigitte Borg, Belinda Miller and Bruce Thompson were awarded a 2010 Alfred Small Project Grant for their research titled ‘Why do some patients with COPD desaturate on exertion, but others do not?’.
- Robyn O’Hehir, Jennifer Rolland and Sara Prickett were awarded a $100,000 Project Grant for 2011 from the Ilhan Food Allergy Foundation and the Gandel Foundation to progress their research towards a peanut allergy vaccine.
- Panyal O’Hehir was awarded a Life Governor award from the Board of Asthma Victoria.
- Jo Douglass became President of the Australasian Society for Clinical Immunology and Allergy 2010-2012.
- Robyn O’Hehir was awarded an Honorary Director of the Governing Board of Cabrini Health Ltd.
- Robyn O’Hehir was awarded to the scientific advisory committee of the Food Standards Australia and New Zealand, an independent statutory agency that works with the governments of Australia and New Zealand to set food standards.
- Jeremy Wrobel was awarded a NHMRC Postgraduate Scholarship for research on pulmonary hypertension in COPD.

**Tele-health Electronic Health Record**

At a visit to The Alfred, Professor John Wilson showcased Tele-health to Prime Minister Julia Gillard, the former Premier John Brumby and Victorian Local Member Tony Lupton. The team have worked on establishing an electronic health record for people with CF. Tele-health enables quick and easy access to the medical history of a person with CF. In conjunction with this electronic record, rural or isolated patients are also able to use a teleconferencing service to receive a specialised CF review with their doctor and the CF team without the burden of travel time.
AIRmed 1: Lung Transplant Service
Head: Professor Greg Snell
The service is one of the largest in the world, performing 3% of all lung transplants worldwide and covering the southern Australian states. It has strong links to clinical programs in severe interstitial lung disease, pulmonary hypertension and severe COPD and includes the Paediatric Lung Transplant Service.

Current Projects
• Mechanisms and predictors of chronic allograft rejection with emphasis on airway remodelling
• Immunological and clinical evaluation of viral (cytomegalovirus) infections
• Ex vivo evaluation of humanised transgenic GAL knockout porcine lungs
• Drug trials in pulmonary hypertension
• Investigation of novel bronchoscopic and surgical treatments for emphysema

AIRmed 2 Cystic Fibrosis Service
Head: Professor John Wilson
The Alfred Cystic Fibrosis Service cares for the needs of over 280 patients. The service is actively engaged in clinical and basic research centred on stem cell therapies, host organism interaction, airway remodelling, nutritional needs, airway function and psychosocial issues.

Current Projects
• Airway remodelling and growth factors in CF
• Advanced glycation end-products in renal injury in CF
• Enhanced nutrition and anti-reflux therapy on clinical and physiological outcomes
• Nocturnal hypoxia and consequences for outcomes in CF
• Electronic health records to audit clinical outcomes
• The use of telemedicine to improve access to care
• Improved care models including palliative care

AIRmed 3 General Respiratory and Sleep Medicine Service
Head: Professor Matthew Naughton
The General Respiratory Service cares for patients with general respiratory diseases including pneumonia, chronic obstructive pulmonary disease, acute and chronic respiratory failure, post-ICU recovery, tracheostomy care, interstitial lung diseases and lung cancer. The Sleep Service manages acute and chronic sleep disorders across a wide cross-section of pulmonary, cardiac and neurological conditions.

Current Projects
• Sleep disordered breathing in heart failure and impact of ventilatory support on mortality
• Non-invasive ventilation support (acute and chronic)
• Role of sleep disorders in motor vehicle collisions
• New management algorithms for sleep disordered breathing
• Premature lung disease in marijuana smokers
• Development of smoking cessation courses
• Relationship between sleep and mood disorders
• Relationship between sleep apnoea and Type 2 diabetes
• Acute and chronic effects of oxygen toxicity

AIRmed 4 Allergy, Asthma and Clinical Immunology Service
Head: Associate Professor Jo Douglass
The service cares for patients with asthma, allergic diseases, systemic autoimmune disorders and primary and acquired immune deficiencies. It includes a node of the national Cooperative Research Centre for Asthma and Airways.

Current Projects
• Asthma in the ageing population
• Physiology and treatment of severe asthma
• Development of non-invasive methods for assessing airway inflammation
• Novel strategies for immunomodulation including nanoparticles
• Drug allergy: clinical and laboratory studies
• Immunological and molecular characterisation of peanut allergens
• Clinical and immunological mechanisms of subcutaneous injection and sublingual allergen immunotherapy
• Investigations of immunodeficiency in non-cystic fibrosis bronchiectasis

Physiology Service
Head: Associate Professor Bruce Thompson
The Lung Function Laboratory underpins many of the AIRmed clinical and research programs. It takes a leading role in the evaluation of new diagnostic tests and the evaluation of lung function testing devices.

Current Projects
• Novel non-invasive measures of small airways disease in asthma, BOS and cystic fibrosis
• Using MRI to measure ventilation and perfusion heterogeneity
• Lung function in the ageing lung
• Gas mixing and lung mechanics in patients with severe asthma
• Quality control of lung function testing

Lung Health Promotion Centre
Manager: Adrienne James
This centre provides innovative education programs and resources for health professionals in all aspects of respiratory disease, but particularly asthma and the development of smoking cessation programs.

Postgraduate Students
12 PhD Students
1 MD Student

Publications
61 Journal Articles
1 Book
2 Book Chapters
The Department of Anaesthesia and Perioperative Medicine is amongst the largest in Australia, consisting of 29 fulltime and over 50 visiting specialist anaesthetists, as well as 40 registrars in training. The department provides anaesthesia, perioperative care, pain management, resuscitation and referral services for Alfred Health. Academic affiliation with Monash University is strong, with Professor Paul Myles appointed as Chair of the Academic Board of Anaesthesia and Perioperative Medicine.

A dynamic research unit within the department focuses on patient safety, quality of care, improving pain relief and avoiding serious complications after surgery. The research unit is headed by Paul Myles (supported by an NHMRC Practitioner Fellowship) and funded through a number of large NHMRC grants. Dr James Tomlinson and Dr Joel Symons were appointed as senior lecturers and Dr Georgina Thompson is the department’s first research fellow.

In 2010, Paul Myles was awarded the Australian and New Zealand College of Anaesthetists’ prestigious Robert Orton Medal for distinguished service to anaesthesia. Paul was successful with two new NHMRC Project Grants commencing in 2011: continued funding of $3.3 million for the ATACAS trial (as CIA) and $1.1 million for POISE-2 (as CIB).

Current Projects
The unit is currently coordinating four multicentre international trials and participating in a further five trials, including randomised clinical trials, audits and surveys. The larger trials, led by Paul Myles, include:

ENIGMA-II Trial www.enigma2.org.au
One of the biggest research initiatives of the department is to investigate the safety of nitrous oxide in 7,000 patients undergoing major surgery who have risk factors for coronary artery disease. It is expected that avoidance of nitrous oxide will reduce the incidence of cardiac complications or death when compared with otherwise identically managed surgical patients receiving a non-nitrous oxide anaesthesia regimen. This multicentre international trial, funded by a $2.8 million NHMRC grant, commenced in May 2007.

Coordination of the trial is by the department together with the ANZCA Trials Group. Collaborating research groups are in Australia, New Zealand, Hong Kong, Canada, USA, India, Saudi Arabia, UK, Malaysia, Switzerland and Singapore.

The ATACAS Trial www.atacas.org.au
The Aspirin and Tranexamic Acid for Coronary Artery Surgery (ATACAS) Trial is a multicentre, randomised, controlled trial established to answer whether aspirin or tranexamic acid, or both, should be used in people having heart bypass surgery. This NHMRC and ANZCA funded trial is jointly coordinated by the ANZCA Trials Group and the department, and aims to enrol 4,600 patients. Collaborators are based in Australia, the UK, India and Canada.

Despite some concern that recent aspirin ingestion increases blood loss after coronary artery surgery, there is some evidence that this may reduce thrombotic complications. In contrast, antifibrinolytic drugs can reduce blood loss in this setting, but there is concern that they may increase thrombotic complications. Published guidelines are limited by a lack of large randomised trials addressing the risks and benefits of each of these commonly used therapies in cardiac surgery.

MASTER Recurrence Trial
This study will test the hypothesis that intraoperative and postoperative epidural analgesia for high-risk (ASA III-IV) patients undergoing major abdominal surgery and complete resection of cancer results in a significant decrease in cancer recurrence and death in the 7 to 12 years after surgery. The study was built on the MASTER trial, which was a large multicentre, randomised trial 1996-2001 that compared epidural regional block with opioid-based analgesia with standard, non-epidural analgesia in 915 high-risk patients having major thoracic or abdominal surgery. A majority of these patients underwent surgery for intra-abdominal cancer. Those patients who underwent cancer surgery were followed up to determine if their cancer has returned, when it returned, and their survival status.

Enhanced Recovery After Surgery (ERAS)
The aim is to evaluate an enhanced recovery after surgery (ERAS) program for abdominal surgical patients in three Victorian hospitals. The project was funded though the Department of Health. The implementation of a comprehensive ERAS program took place over two months and included the education of surgeons, anaesthetists, nurses and allied health professionals.

Data were collected on 154 patients in the pre-implementation cohort and 169 in the ERAS cohort. The conclusion of the project showed that preoperative and surgical practices can be readily modified to incorporate an enhanced recovery program. Training of doctors and nurses in the application of this program improved the quality of care for these patients.
Research Activities

HIV neuropathogenesis and HIV reservoirs in the brain Dr Katherine Thompson: Research in this department has shown that the brain perivascular macrophage is the main reservoir for HIV and is pivotal in relation to spread of infection from the blood into the brain when the immune system deteriorates. Macrophages therefore represent a focus for targeted treatments to prevent cognitive decline from HIV infection in the brain. It is hypothesised that treatment should begin prior to systemic immunosuppression. This work was presented at the 10th International Symposium on Neurovirology, Milan, Italy, 2010.

Pathogenesis of HIV-associated neurocognitive impairment in the era of effective antiretroviral therapy Dr Katherine Thompson in collaboration with Professor Ian Everall and the HIV Neurobehavioral Research Centre, University of California, San Diego. This study is the first to quantify latent viral infection in circulating macrophages and resident brain cells in HIV-positive patients with mild neurocognitive dysfunction, including those using antiretroviral therapy, and will look at associations between latent infection, neuropathology and clinical status.

Progressive multifocal leukoencephalopathy (PML) pathogenesis Dr Julianne Bayliss: Establishment of latent reservoirs of JC virus in the brain, blood, and kidney of healthy and immunosuppressed patients is studied using histology and molecular biology techniques. Specific aims are to determine the cellular sites of viral latency during immunocompetence, delineate the role of immunosuppression in viral reactivation and mobilisation from latent reservoirs prior to the development of PML and to investigate the role of viral genotype in establishing latency and the development of PML.

Biomarkers of JC virus reactivation in immunosuppressed patients Dr Julianne Bayliss: Collaborating with Dr Catherine Cherry, this study investigates the association between specific genes of JC virus within the plasma of HIV/AIDS patients who later develop PML.

Prostate specific antigen (PSA) levels in cyclists over 50 Dr Julianne Bayliss: This study, in collaboration with the Victorian Institute of Sport, investigates the role that long distance road cycling plays on PSA levels in men over the age of 50 through measurement of PSA before and after cycling.

Breast cancer sub-typing and epidemiology Professor Catriona McLean in collaboration with the Cancer Council Victoria. This multinational study (with Cambridge University) highlights the relationship of various subtypes of breast cancers with diet, environmental factors and a new prognostic marker in breast cancer.

The role of phosphatases in breast cancer Professor Catriona McLean in collaboration with Professor Christina Mitchell.

Characterisation of TCPTP as a tumour suppressor in breast cancer Professor Catriona McLean in collaboration with Professor Tony Tiganis.

The Australian Breast Cancer Family Study Professor Catriona McLean in collaboration with Professor John Hopper.

Australian Brain Bank Network (ABBN) Professor Catriona McLean is Director of the ABBN, overseeing the coordination, neuropathological diagnosis and research activities of the ABBN and the Victorian arm of the network. Over 1,000 fully pathologically analysed brains are available for research (www.nnf.com).

Neurotrauma brain bank Dr Tony Frugier (NTRI), Professor Catriona McLean

Neuroimaging (using novel binders) of neurodegenerative diseases

A study of TDP-43 in motor neurone disease

The role of LRRK2 in Parkinson’s disease

A study of FHL1 in muscular dystrophy

A study of filamin C in myopathy

A study of the use of mesenchymal stem cells in an ovine model

Major Achievements

Professor Catriona McLean is CIA of a five-year ($2M) NHMRC Enabling Grant to facilitate continued brain banking for neurodegenerative diseases. She is also CIA on a continuing ($800,000) grant into neurotrauma through the Victorian Neurotrauma Initiative (VNI) and is a CI on four NHMRC Project Grants. Professor McLean is one of multiple national and international investigators on a ($6M) five-year NIH grant that will investigate genetic causes of familial breast cancer. She was invited to present her work in latent virus of the brain at the International Society of Neuropathologists Congress in Salzburg, Austria.

Dr Julianne Bayliss received the Donald H Gilden Lectureship award for excellence in Neuroscience at the 10th International Symposium on Neurovirology, Milan; travel grants from the Ian Potter Foundation, Monash University and the International Society for Neurovirology, and best poster prize at the Brain Awareness Week Symposium, Monash University.

Colleen D’Arcy received a Monash University travel grant.

Colleen D’Arcy (left) and Professor Catriona McLean examine tissue sections using a dual header microscope.
The Australasian Cochrane Centre (ACC) coordinates activities of the Cochrane Collaboration in Australia and the region by providing training and support to authors of Cochrane systematic reviews, working with policy makers, advocating on behalf of the Collaboration regionally and promoting the use and uptake of The Cochrane Library.

The region supported by the ACC encompasses East Asia, South East Asia, New Zealand and the Pacific Islands. The Centre works closely with many Cochrane people in the region and has established branches in Korea, New Zealand, Singapore and Thailand, and supports networks in Malaysia, the Philippines and East Asia.

Training and Support of Review Authors
The Cochrane Collaboration continues to grow worldwide, and Australasian review authors are widely recognised as active and productive contributors to The Cochrane Library. Over 2,700 authors contribute to the Cochrane Collaboration from countries supported by the ACC, of whom 2000 are based in Australia.

In 2010, ACC conducted seven ‘Introduction to writing a Cochrane review’ courses around Australia and overseas, plus several review completion workshops. ACC’s training team also has a leading role in the development and quality improvement of training internationally through the Cochrane Collaboration’s Cochrane Training initiative.

Current Research
ACC has a program of research exploring effective ways to inform health care decisions through the uptake of evidence. It has projects investigating the synthesis, interpretation, dissemination and implementation of research evidence for clinical practice and policy.

SEA-URCHIN
SEA-URCHIN (South East Asia – Using Research for Change in Hospital acquired Infection in Neonates) is an NHMRC-funded collaborative project (2011-2015) between Thailand, Malaysia, the Philippines, Indonesia and Australia. The project aims to address whether neonatal infection rates can be improved by increasing the capacity for research synthesis and improving the implementation of effective interventions into practice.

From left: Visiting Fellow Charoonsak Somboonporn (Thailand), Co-Director Steve McDonald, Endeavour Fellow Kun Hyung Kim (Korea) and Systematic Review Trainer Miranda Cumpston.

PLI
The PLI (Policy Liaison Initiative) is an ongoing collaboration between the ACC and the Federal Department of Health and Ageing that aims to encourage and support evidence-based approaches to policy making. The initiative aims to address barriers to using research evidence, particularly Cochrane reviews, through the provision of policy-appropriate summaries of Cochrane reviews and a program of training and support in research use for Department officers.

CIPHER
In partnership with the SAX Institute in Sydney, CIPHER (Centre for Informing Policy in Health with Evidence from Research) is an NHMRC-funded project investigating ways to increase and measure research use in policy decisions.

ALIGN
Chiropractors and physiotherapists provide much of the care for acute low back pain in Australia. The development and publication of the NHMRC clinical practice guidelines for acute low back pain has provided recommendations with the potential to improve the quality of care and safety for people with acute low back pain. ALIGN (Acute Low-back pain Implementing Guidelines iNto practice) investigates the effectiveness of a targeted, theory-based implementation strategy developed to implement clinical practice guidelines in practice.

IRIS
IRIS (Investigating Research Implementation Strategies) investigates the care of people with dementia in general practice, and the effectiveness of a targeted, theory-based implementation strategy to implement evidence-based recommendations into clinical practice. IRIS explores ways of changing practice in line with recommendations and measuring the benefits to health outcomes of people with dementia.

NET
Scientific research continually produces new findings that improve health care. However, research cannot improve health outcomes unless health professionals and health services incorporate the findings into their practice and policies. Successfully changing practice and policy in line with new research relies on strategies that overcome specific barriers. NET (Neurotrauma Evidence Translation), funded by the Victorian Neurotrauma Initiative, develops and tests strategies to increase the uptake of research into policy and practice, facilitating improved outcomes for people after traumatic brain injury.

2010 Highlight

Postgraduate Students
3 PhD Students

Publications
16 Journal Articles
1 Book Chapter
The Australian Centre for Blood Diseases (ACBD) is a leading national and international blood diseases centre with recognised research, treatment, and educational programs for blood diseases. ACBD is affiliated with Monash University, Alfred Health, Eastern Health and Southern Health, and is organised into three integrated divisions:

- Clinical and Diagnostic Haematology/Oncology
- Clinical and Basic Research Programs
- Teaching and Education

Thrombosis Research Unit

Head: Professor Shaun Jackson

Blood clotting diseases are Australia’s major healthcare problem affecting more than 50% of the adult population and killing one Australian nearly every 10 minutes. Despite intense investigation over the last 40 years into the discovery and development of more effective anti-clotting drugs, the impact of these therapies on mortality rates has remained disappointingly low, with less than 1 in 6 patients taking anti-clotting therapies avoiding a fatal clotting event. This situation is likely to worsen in the future due to the rapidly growing incidence of obesity and diabetes. People with diabetes are typically more resistant to the benefits of anti-clotting therapy; thus there is a pressing need for the identification and development of more effective approaches in the prevention of blood clotting.

Underlying the formation of blood clots are platelets: small, specialised blood cells that stick to areas of injury in blood vessels in order to stop bleeding, in a process known as haemostasis. When triggered within diseased blood vessels, this normally protective process becomes exaggerated and results in an abnormal platelet plug that blocks blood flow through the vessel (arterial thrombosis). Thus, platelets represent a key ingredient in the development of blood clots (thrombosis) that lead to devastating diseases such as heart attacks and strokes.

The unit aims to further our understanding of the basic principles surrounding normal haemostasis, with the ultimate goal to discover a “magic bullet” that selectively targets pathological thrombosis without compromising haemostasis. The laboratory also investigates the important cross-talk between blood clot formation and inflammation. A major highlight for 2010 was the award of an NHMRC Australia Fellowship to Professor Shaun Jackson.

Current Projects

- Novel insights into platelet function and thrombus formation
  - Novel approaches to regulate blood clot contraction and arterial thrombolysis (S Schoenwaelder)
  - Mitochondrial pathways in procoagulant platelet function and survival (S Schoenwaelder)
  - The prothrombotic implications of diabetes (S Al-Daher)
  - Dynamic interplay between thrombus formation and inflammation (Y Yuan)
- Biochemical and physical factors regulating platelet function
  - A role for Dok2 proteins in regulating haemostasis and thrombosis (S Hughan)
  - Disturbed blood flow and blood clot formation (W Nesbitt)

Serpin Biology Unit

Head: Professor Paul Coughlan

The prevention and treatment of blood clots is a delicate act: too much anti-platelet or anti-coagulant therapy can lead to unwanted bleeding, which can have catastrophic consequences (such as haemorrhagic stroke), while fibrinolysis therapy can cause brain damage. The unit examines alternative ways of treating and preventing blood clots, by focusing on the serpin (serine protease inhibitor) superfamily of proteins.

When blood clots form in response to injury, a naturally occurring process of dissolution is also activated. This leads to the clearance of clot from blood vessels during the healing process. Similarly, in diseases such as heart attack, stroke and deep vein thrombosis, clots are usually dissolved over time. In many people this mechanism is inefficient. In the past, activators of clot dissolution have been exploited to treat people with thrombosis. There is a balance in blood between the main clot dissolving factor, plasmin, and its regulator, antiplasmin. The unit studies the ways that these proteins recognise each other and bind together, and has shown that by interfering in this interaction, the clot dissolving process can be accelerated. Ongoing work involves the development of agents which will ultimately be used to treat blood clots and thereby hasten the recovery from thrombotic diseases.
Fibrinolysis and Gene Regulation
Head: Associate Professor Robert Medcalf
The removal of blood clots from the circulation and the turnover of extracellular matrix proteins are facilitated by specialised enzymes. One of the most important enzymes in this setting is plasmin, which is the end product of the fibrinolytic system. Plasmin performs many functions but it is generally accepted that its primary role is to degrade fibrin, the structural scaffold of a blood clot.

The main interests of the unit are in the molecular and cellular biology of this enzyme system, particularly in gene regulation in various cell types. Efforts are also devoted to understanding the biology and pathophisiology of the plasminogen activator system in the central nervous system, particularly in relation to ischemic stroke and neurotrauma and modulation of the blood brain barrier.

Current Projects
- Regulation of tissue-type plasminogen activator gene expression in vitro (R Medcalf, A Samson, M Sashindranath)
- The role of t-PA in the central nervous system (R Medcalf, A Samson, M Sashindranath)
- To understand the means by which t-PA modulates the blood–brain barrier (R Medcalf, B Niego)
- Regulation of the plasminogen activator inhibitor type 2 gene expression (S Stasinopoulos)
- The modulatory effect of the plasminogen activating system on the immune response (R Borg, A Samson, R Medcalf)

Malignant Haematology & Stem Cell Transplantation
Head: Associate Professor Andrew Spencer
A diverse range of translational and clinical research activities exploring improved therapeutic approaches to a variety of blood cancers continued.

Myeloma Research Group
- Epigenetic targeting of haematological malignancies (D Mithraprabhu, A Spencer)
- Small molecule development program (T Khong, A Spencer)
- Cell adhesion mediated drug resistance in multiple myeloma (K Monaghan, A Spencer)
- Tissue array as a predictive tool in multiple myeloma drug response (A Kaff, A Spencer)
- Heat shock proteins as targets for anti-myeloma therapy (E Nichols, A Spencer)
- Impact of CD45 expression on drug resistance and disease progression in multiple myeloma (C Lin, A Spencer)
- Dual kinase inhibitors to target acute myeloid leukemia (AML) (M Guthridge, A Wei)
- The role of inositol phosphatides in regulating PI3K in AML (A Wei, S Rijal, C Mitchell)
- A platform technology for prognostication in AML (A Wei, D Irwin, J McManus)

Stem Cell Transplantation Research Group
- Late Effects Clinic (P Walker, S Avery)
- Immune reconstitution following novel reduced intensity conditioned stem cell transplantation (SCT) (P Walker, A Spencer)
- Longitudinal audit of invasive fungal infections in SCT and acute leukaemia induction (P Walker)

Haematology Clinical Research Unit
Clinical trial activities remained at a high level in 2010, with 34 open trials, with an increasing proportion of Phase 1 and first-time-in-human studies being conducted. Throughout 2010 and into 2011, a suite of multicentre investigator-initiated trials of novel therapeutic approaches to both multiple myeloma and AML were initiated. The Clinical Research Unit acted as the national coordinating site for the ALLG-GIMEMA MM11 myeloma trial.

Eastern Clinical Research Unit
The Eastern Clinical Research Unit (ECRU) is an initiative of the Monash University Department of Medicine and is based at Box Hill Hospital, Maroondah Hospital and The Alfred. ECRU has been involved in clinical trials since 1996 and employs over 50 medical and nursing staff who are involved in the management of over 150 clinical trials in both medical and surgical specialties. ECRU is now the largest multidisciplinary clinical trial unit in Australia. ECRU has particularly distinguished itself in its ability to recruit, collect statistical data and retain trial participants.

ECRU Biotechnology Research Division
ECRU Biotechnology (ECRU Biotech), headed by Dr Anthony Dear, aims to expand the capabilities of ECRU beyond clinical research to a better understanding of the activity of existing pharmaceuticals and the development of new treatments. This in turn promises to deliver better treatment than is currently available. Active contributors to ECRU Biotech include members of several disciplines from the clinical activity at ECRU including endocrinology, neurology and oncology together with significant support from the pharmaceutical industry.

ECRU Biotech also seeks to foster an environment supportive of ongoing academic endeavour, offering biotechnology research projects for Honours and PhD students.

Selected ECRU Biotechnology Collaborative Research Projects
- Assessment of novel small molecule treatments in in vivo models of abdominal aortic aneurysm, atherosclerosis and neointimal hyperplasia (R Widdop, Department of Pharmacology, Monash University)
- Effects of liraglutide on vascular endothelial peptide expression in in vitro and in vivo models of vascular disease (K Lynch, Celgene Corporation)
- Effects of novel HDAC inhibitors and azacytidine in the myelodysplastic syndrome (J McKendrick, Department of Medicine, Box Hill Hospital; G Leone and M Voso, Catholic University, Italy; K Lynch, Celgene Corporation)
- Effects of incretins on severity of acute thromboembolic cerebrovascular accident (C Bladin, Department of Neurology, Box Hill Hospital)

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The Australian Centre for Health Innovation (CHI) provides health technology evaluation, innovation and simulation education services that enhance patient safety and quality of care. CHI plays a key role in providing health services with access to innovative technology and education services. Over 7,500 clinicians, managers and technology developers from across Australia used CHI services in 2010.

**Key Findings**

**Reducing Patient Harm from Blood Transfusion – Wrong Blood in Tube (WBIT)**

A report prepared for the Victorian Managed Insurance Authority (Jeffcott S, Steele C, Cameron P)

The potential for serious problems in blood labelling exists at each step of the transfusion process. The most common error is known as ‘wrong blood in tube’ (WBIT), where the patient identification information belongs to one person but the blood belongs to another. The Victorian Managed Insurance Authority (VMIA) sponsored an observational study of existing strategies to combat WBIT across three public hospitals in Victoria. The human factors involved in WBIT incidents were examined through direct observations, interviews and identification of where and how processes might fail. The development of recommendations for reducing patient harm from blood sample collection and a toolkit for hospitals to evaluate their safety systems are the key outcomes from this work.

**Radiofrequency Identification (RFID) Scanning of Implants: Improving Logistics and Efficiency**

CHI worked with Stryker and Magellan to demonstrate a proof of concept for RFID enabled tracking of orthopaedic implant equipment on consignment to a hospital. The RFID tunnel developed by Magellan can accurately read multiple passive RFID tags in three dimensions within each stock container to enable staff to track stock in seconds rather than hours using the current manual recording systems. As a result, three Victorian hospitals commenced trials of the equipment in 2010.

**Clinical Requirements for Videoconferencing and Clinical Communications**

A series of evaluation workshops was held for clinicians and their information and communication technology colleagues from across Australia to determine the functional requirements for clinical videoconferencing. This project was commissioned by a group of national health chief information officers to better inform their decision making about videoconferencing technologies for clinical consultation.

**Simulation Education**

New courses at CHI included:

- Patient safety for fifth year medical students from Monash University, Malaysia
- Introduction to trauma care: interdisciplinary simulation course

**Current Projects**

- The use of sensors to protect privacy and security in patient bedrooms
- Collaboration tools for palliative care and degenerative neurological conditions
- Development of further trauma courses with The Alfred Trauma Unit and NTRI
- A comparison of tablet functionality for use in health services
- Advising on information and communications technology developments for digital hospital design
- Models of cloud services for healthcare
- Rapid roaming authenticated desktop access for clinicians

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Medical simulations at the Australian Centre for Health Innovation.
Baker IDI Heart and Diabetes Institute is a world renowned medical research facility. Our work extends from the laboratory to hospital research and wide-scale national and international community studies with a focus on diagnosis, prevention and treatment of diabetes and cardiovascular disease.

Our mission is to reduce death and disability from cardiovascular disease, diabetes and related disorders, two complex diseases responsible for the most deaths and the highest costs in the world in terms of treatments and hospitalisation.

Our main laboratory facilities located at AMREP are complemented by a network that includes a research facility in Alice Springs dedicated to Indigenous health, a preventative health laboratory in South Australia with a focus on nutrition and community intervention research, as well as expanding research operations in Singapore.

The institute’s work covers five broad themes of research, each of which supports groups of scientists who work in a laboratory setting as well as researchers who work in the community. This integration of basic scientists with epidemiologists, clinicians and public health professionals is central to Baker IDI's strategy to perform research that is directly informed by community needs and to translate discoveries into everyday clinical practice.

Population Studies and Profiling
This group works at understanding the prevalence of disease and disease risk in the population and improving the health of the community. The focus is on prevention and education, as well as development of better profiling tools.

Metabolism and Obesity
The group explores the complex relationship between physical activity, weight regulation and the genetic and environmental underpinnings of metabolism to address the causes and complications of metabolic disorders and obesity.

Diabetic Complications
Diabetes is a chronic, insidious disease that is on the rise in the community. Among its many debilitating complications are heart and vascular disease, kidney and eye disease. This group focuses on understanding which people are most at risk of the complications of diabetes and discovering ways to mitigate the effects of the disease.

Vascular and Hypertension
This group brings together studies on high blood pressure, kidney disease, the neurobiology of the relationship between depression and heart disease, as well as research into the damage to arteries caused by atherosclerosis, and the damage caused by heart attack.

Cardiology and Therapeutics
Heart failure, acute coronary syndromes and better treatment options for atrial fibrillation are among the research areas for this group. These forms of cardiovascular disease are increasing the health burden of communities. The focus is on taking laboratory findings and translating them into better drugs, surgical and therapeutic devices for people suffering from heart disease.

As well as these research themes, we have a strong presence in health care which includes a multidisciplinary, evidence-based diabetes clinic, diabetes education, and the Healthy Hearts Clinic, providing cardiovascular disease risk assessments to the community.

Baker IDI is also active in training health professionals and collaborating on international projects in heart disease and diabetes.

Celebrating 85 Years
In 2011, we will celebrate 85 years since the Baker Medical Research Institute was established. Our researchers have been responsible for many groundbreaking advances including:

- proving that exercise can lower blood pressure
- proving that mental stress and cigarette smoking both provide powerful, selective and potentially harmful stimulation of the nerves of the heart
- developing techniques to assess stiffness of arteries, enabling the reliable early detection of atherosclerosis and hypertension
- establishing open heart surgery in Australia in collaboration with The Alfred hospital
- developing a method to repair heart valves without surgery
- identifying key factors involved in blood clotting
- defining the differences between Type 1 and Type 2 diabetes

The Baker IDI Research Framework
Baker IDI’s research agenda is based on the notion of a disease continuum from birth to death, with the opportunity of preventing the progression of disease at any stage. These themes encompass our activities ranging from cellular and molecular biology, to integrative physiology, population studies, preventative health initiatives and clinical services focused on:

- Early life: and the experiences during pregnancy and infancy that may be a determinant of an individual’s propensity to develop diabetes, metabolic syndrome and, subsequently, cardiovascular disease in middle age.
- Childhood and adolescence: with a view to informing policy and developing novel ways of altering the balance in an individual between energy expenditure, food intake and nutrient density, as well as providing better information on optimal diets and physical activity programs.
- Adults with risk factors: including assessment of cardiac and metabolic risk; the causes and treatment of the major cardiovascular risk factors particularly diabetes, hypertension and abnormalities of blood fats; and risk factor clusters such as the metabolic syndrome.
- Sub-clinical organ damage: with a focus on the time in life when asymptomatic risk factors cause measurable changes in the body particularly the arteries of the heart, brain, kidneys and eyes.
**Acute complications:** heart attack, stroke and sudden death; with a focus on understanding the mechanisms underlying the development and rupture of unstable plaques.

**Clinical complications:** angina, kidney failure, dementia; with a focus on the development of disease management programs, particularly in high-risk communities such as the Australian Indigenous community.

**Heart failure and terminal disease:** including work ranging from fundamental research on maintaining the viability and function of heart cells in the context of advanced disease, the prevention of complications of a failing heart such as arrhythmia, the development of new devices to cure atrial fibrillation, and stem cell research to replace damaged heart muscle or help arteries heal.

### Research Highlights

In an extremely productive and successful year, research has continued in a range of areas from cellular and molecular studies to wide-scale community screening and intervention programs, and the translation of research findings into the next stage of therapy development. Findings have been published in high impact journals including *The Lancet*, *New England Journal of Medicine*, *Journal of the American Medical Association*, *Cell Metabolism*, *Molecular Psychiatry*, *Circulation* and *British Medical Journal*.

#### Early Life

- Recent advancements by the Laboratory for Muscle Research and Therapeutic Development shed new light on the potential use of gene therapy to treat the complications of inactivity and advancing age, as well as a host of conditions that are caused or complicated by the loss of muscle mass and strength.
- Description of the molecular mechanism that explains how blood vessels are damaged by prior episodes of high glucose, a well-described clinical phenomenon, that is for the first time starting to be unravelled using modern molecular biology.

#### Childhood and Adolescence

- Discovery that a heat shock protein in muscle inhibits inflammation and prevents insulin resistance (pre-diabetes) in the context of obesity and high-fat feeding. Plans are now under way to test these findings in human clinical trials.
- Breaks in sedentary time have beneficial associations with metabolic risk. These findings suggest new public health recommendations regarding breaking up sedentary time that are complementary to those for physical activity. A range of studies are under way to examine the links between sedentary behaviour and metabolic risk in environments such as the workplace.
- Discovery that HDL cholesterol has an important role in glucose and fat metabolism. These findings suggest a potential role for HDL raising therapies beyond vascular disease to address key aspects of the metabolic syndrome. Research is now under way to see if there is a sustained benefit with prolonged HDL elevation.
- Development of a world-first urinary test with the potential to screen for heart disease long before any symptoms emerge.

#### Adults with Risk Factors

- In *The Lancet*, data from AusDiab (the largest Australian longitudinal population-based study ever conducted) was used to question the basis on which the diagnostic blood sugar levels for diabetes have been set. AusDiab also published the first ever national statistics in any developed country on the incidence of diabetes. AusDiab identified the potential for a novel intervention to improve metabolic health: in addition to reducing total sedentary time, any prolonged sedentary periods should be avoided. Funding was secured to facilitate the next stage of AusDiab by Associate Professor Jonathan Shaw and his team, which will track 11,000 Australians over 12 years to determine how many people develop diabetes, obesity, kidney and heart disease. A diabetes risk score instrument for assessing the risk of developing diabetes has been developed from AusDiab, and is now being used nationally (and as part of a new Medicare item) to select people for diabetes prevention programs.
  - An international conference held in Prato, Italy, attracted good audiences on the topical subject of the link between stress and heart disease. The conference on psychogenic heart disease served to further establish our reputation as leaders in this field.
  - The discovery of important interactions between cell compartments in generating potentially harmful reactive oxygen species which damage the kidney in diabetes. These findings have direct clinical implications emphasising the multiple sources of damaging molecules in the diabetic environment that need to be blocked or scavenged in order to reduce blood vessel and kidney injury in diabetes.
  - The demonstration that HDL has profound anti-inflammatory effects on monocytes, helping to explain why this ‘good cholesterol’ helps to avoid atherosclerosis.
  - The discovery of a novel treatment for patients with focal atrial tachycardia, which was published in the *Journal of the American College of Cardiology*. The abnormal focus for the arrhythmia was ablated and heart function returned to normal within three months.
  - Advancement of our work to develop a drug that can prevent the formation of atherosclerotic plaques by preventing changes in proteoglycans. Patents are in place and research is continuing on the development of this drug.
  - A world-first breakthrough in the treatment of high blood pressure was pioneered by Baker IDI researchers, with a study showing a new catheter-based treatment is delivering remarkable improvements in blood pressure levels to clinical trial participants. The procedure involves the insertion of a catheter through the femoral artery and uses radio frequency to ‘silence’ sympathetic nerves in the renal artery. The results of this study, which were published in *The Lancet*, are expected to revolutionise treatment options for high blood pressure around the world.

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*Baker IDI Associate Director and Head of Clinical Diabetes and Epidemiology, Associate Professor Jonathan Shaw, with a patient in the institute’s purpose-built Specialist Diabetes Clinic.*
Sub-clinical Organ Damage

- We developed a new poly-marker approach for the diagnosis of coronary artery disease using urine samples. Using capillary electrophoresis coupled to mass spectrometry, we defined proteome patterns that are highly specific for coronary artery disease.
- Identification of novel pathways that contribute to myocardial hypertrophy and cardiac fibrosis, key factors in the damaging effects of an enlarged heart in disease, and explaining how heart enlargement in athletes, which occurs through different pathways, is beneficial.
- The description of the role of two relatively recently discovered proteins, ACE2 and RAGE, which could potentially become new drug targets for cardiovascular and metabolic disorders.
- A short course of relaxin treatment in older rats with hypertension was found to lead to marked changes in the large artery structure and a reduction in blood pressure. This suggests a possible therapy in humans is worth exploring.

Clinical Complications

- Clinical trials of a medical device developed at Baker IDI in conjunction with Osprey Medical continued. The device allows people with kidney disease to have coronary angiography without further damaging their kidneys.
- Our staff were key investigators involved in the publication of two landmark studies in the *New England Journal of Medicine* on the best drug treatment for diabetes (ADVANCE) and for people at high risk after stroke, heart attack or other vascular event (ONTARGET, TRANSCEND).
- The Heart of the Heart program was launched in Central Australia in 2009. Dr Alex Brown and his team have screened 200 Indigenous adults as part of this landmark study of cardiovascular disease.
- We have continued to support the Heart of Soweto Study in South Africa with over 8,000 patients now captured via Africa’s largest study of heart disease.
- Discovery that inhibition of the hormone, angiotensin II, reduces aortic diameter in patients with Marfan syndrome.
- Development of a novel method for assessing cardiac fibrosis in the human heart using MRI. Further studies are now under way.
- Orthostatic intolerance is a disordered control of blood pressure and causes recurrent fainting and severe fatigue when people stand up. Our molecular research has uncovered a new mechanism that may be responsible for this that will form the basis for new treatments. Former Wiggle, Greg Page, is a sufferer and has supported our research by establishing a fund.

Acute Complications

- Research has uncovered what appears to be the basic cause of heart attack risk in depressive illness. This finding suggests specific treatment to protect patients with depression from heart attack beyond treating their depression alone.

Future Directions

New research initiatives planned for Baker IDI will enhance diabetes and heart disease research and management. Current facilities include:

Metabolomics

Devising new therapies to combat obesity is challenging due to the complex nature of metabolic disease. To develop treatments for metabolic disorders such as obesity, therapies must first be tested in isolated cell systems before progressing to clinical trials. The knowledge gained through research conducted in the planned new facility will allow researchers to devise more effective prevention and treatments. Once the gene functions and defects implicated in particular diseases are identified, researchers can develop ways to screen people for risk factors and design remedies that target the causes and complications of disease.

DNA and Blood Profiling

The establishment of this facility in 2008 represented a major advance in the area of personalised medicine. By more effectively understanding the genetic underpinnings of disease, clinicians will be able to diagnose, treat and care for their patients in a holistic manner. The central idea behind this facility is to integrate existing research disciplines so that health problems are understood and resolved in a way that takes into account individual responses to risk factors.

Clinical Metabolism: The Healthy Lifestyle Research Centre

Diet, exercise and genetics all play important roles in weight regulation. However, it is important to understand the specific underlying causes of obesity, which remain unclear. Opened in May 2010, the Healthy Lifestyle Centre, enables researchers to examine how genetic and environmental factors combine to influence body weight. This unique new facility helps improve understanding about the effects of physical activity and nutrition for the prevention, management and treatment of obesity and its complications, including diabetes and cardiovascular disease. Baker IDI has made several key appointments in the field of health behaviour, including Professor Neville Owen. Professor Owen’s research relates to the primary prevention of cancer, diabetes and heart disease, and deals with the environmental, social and personal-level determinants of behavioural risk factors, including television viewing, and desk and screen-bound work.

Specialist Diabetes Clinic

A dedicated clinic combining state-of-the-art facilities opened at AMREP in May 2010. With more than 8,000 patients, it is the largest facility of its kind in Australia. Originally located adjacent to Caulfield Hospital, the new facilities complement the high-quality education and clinical care of this service. The co-location of these clinical services with Baker IDI’s research facilities provides greater opportunities to link groundbreaking research with patient care.

Medicinal Chemistry

This facility promotes and enhances existing Baker IDI research projects by providing scientists with the tools they need to further examine the therapeutic potential of particular compounds. Medicinal chemistry is the science of providing small, technically accessible, synthetic molecules. These molecules can be used to induce a change to the human system or better facilitate scientific observations.
Bioinformatics
An internal, web-accessible workbench called Galaxy was established at Baker IDI to allow scientists to more easily study large data sets, support reproducible, translational genomic and genetic research and allow common analysis among researchers. The work sits at the intersection of biology and computer science, applying computational and mathematical methods to experimental biology. Galaxy was set up by Dr Ross Lazarus (Director of Bioinformatics at the Channing Laboratory, Harvard University) who joined Baker IDI in 2010.

Baker IDI Central Australia: Indigenous Health Research
As part of our mission to address the health inequalities of disease between Indigenous and non-Indigenous Australians, the institute established a dedicated Indigenous health research facility based at Alice Springs. Baker IDI’s research program is conducted in close consultation with local communities, working with existing community services and designed to have an immediate impact on vascular health, while improving mortality rates in future generations. In 2010, Baker IDI opened the W&E Rubuntja Research and Medical Education Building, which is jointly tenanted with Flinders University Rural Clinical School.

Dr Alex Brown and Professor Sandra Eades were among the chief investigators in the newly-established Centre of Excellence for Indigenous Primary Care Intervention Research in Chronic Disease. It is one of three specialist centres announced in late 2010 under the auspices of the Australian Primary Healthcare Research Institute to undertake research focused on key health reform challenges.

International Projects
By providing an extension of its Australian research to vulnerable societies around the world, Baker IDI improves the understanding of health and disease around the globe. Part of Baker IDI’s mission is to reduce premature ill health and mortality from diabetes and heart disease wherever it occurs. There is a great disparity in health outcomes between Western and developing communities. Poverty is one of the strongest indicators of poor health and it is this inequality that must be addressed. Projects under way include:

Mauritius: The institute’s long-standing relationship (over 25 years) with Mauritius passed a major milestone in late 2009 with the signing of a Memorandum of Understanding (MoU) between Baker IDI and the Mauritian government to extend our research into non-communicable diseases, in particular Type 2 diabetes in Mauritius. The objectives of this agreement are to improve the current understanding of the mechanism of Type 2 diabetes through family studies so that effective treatment is possible in the future. The relationship also provides a framework for training and exchange between Mauritian scientists and students with an interest in medical research.

The institute has provided support in the form of survey methods and execution, data analysis and sample preparation. This is an important partnership documenting premature ill health and mortality in a multi-ethnic society that reflects our global population. Projects on gestational diabetes and prevention of Type 2 diabetes are in the planning phase and the largest surveillance of diabetes complications in any developing nation has just been concluded and published.

Heart of Soweto: This landmark program of research is conducted by Baker IDI in collaboration with the University of the Witwatersrand and the Hatter Cardiovascular Research Institute, South Africa. The team documents emergent heart disease in Africa’s largest urban concentration of black people. Comprehensive data from more than 6,000 hospital cases (2006-2008) and 1,300 primary care cases (2009), have resulted in unique reports on emergent heart disease (The Lancet and European Heart Journal), heart failure (Circulation), hypertension (International Journal of Cardiology), rheumatic heart disease (European Heart Journal) atrial fibrillation (Heart) and primary care burden of heart disease (International Journal of Cardiology). These data have informed and influenced health care policy in that country. A new phase of research involving the Heart of Africa Study and the multicentre, international Big 5 Primary Prevention Trial aims to extend heart disease surveillance to other Sub-Saharan countries, and examine the impact of a family-based prevention trial in South Africa and Mozambique.

United Arab Emirates
Baker IDI has an MoU with the University of Sharjah. The United Arab Emirates (UAE) is the epicentre of the global epidemic of diabetes and a national study is in the planning phase. The University of Sharjah has been contracted to undertake the study, and Baker IDI will be advising on the survey methods and execution, training of UAE staff, data analysis and sample preparation.

Singapore
Baker IDI has an expanding base in Singapore as a result of key collaborations with organisations such as Duke University, SingHealth and the National University of Singapore (NUS), with the aim of fostering research in cardiovascular disease and metabolic disorders.

NUS has also established the NUS Initiative to Improve Health in Asia as part of its NUS Global Asia Institute. Baker IDI is represented on the International Advisory Board by Professor Paul Zimmet. The first collaborative project to look at the frequency of diabetes and risk determinants in Asian populations is under way between epidemiology groups at NUS, Baker IDI and two leading centres in Beijing.

Postgraduate Students
- 64 PhD Students
- 2 Masters Students

Publications
- 386 Journal Articles
- 3 Books
- 15 Book Chapters
The past 12 months have been an exciting time for the institute with a number of strategic initiatives and structural changes implemented, the completion of new laboratory facilities, and a strong performance against key organisational indicators.

Our newly articulated mission statement is ‘to achieve better health for poor and vulnerable populations in Australia and internationally through research, education and public health’. This statement best reflects who we are today and where we are headed. While it has a strong focus on the communities we serve, it provides us with the flexibility to address key health issues across our research and public health continuum.

Of great significance was the completion and occupation of the Alfred Centre Stage 2, which was the culmination of more than five years of planning and construction, involving the hard work and extraordinary commitment of many Burnet staff and board members. Our new state-of-the-art laboratory facilities located on Level 7 of the Alfred Centre have significantly enhanced our capacity and we are already seeing the benefits of expanded research and public health programs.

A number of new initiatives were implemented during the year. The institute developed a new ImmunoMonitoring Facility (IMF), the only NATA-accredited facility of its kind in Australia, providing biotechs access to support for clinical trials of novel vaccines and immunotherapies.

The Centre for Population Health and its collaborating partners have established a Centre of Research Excellence aimed at reducing the health, social and economic problems of injecting drug use in Australia. This was just one of a number of grant and fellowship successes received from the NHMRC in what was a record year of achievement. Research in human immunodeficiency virus (HIV), malaria, hepatitis C, immunity and vaccines, drug dependency and health of prison populations were just some of the areas supported at the institute this year.

In developing our key health themes, we made a number of strategic appointments to the institute. Professor Louisa Degenhardt has been appointed as Principal in Young People’s Health. Dr James Beeson and Dr Freya Fowkes and their team of researchers and epidemiologists joined our Centre for Immunology, significantly increasing the institute’s expertise focused on the global health issues associated with malaria. Dr Beeson has since become the head of the Centre for Immunology.

**Centre for Virology**

The Centre for Virology’s mission is to find innovative solutions for the world’s most serious viral diseases, focusing on understanding how viruses manipulate their host cells in order to infect them and persist in the body. Research in this area is vital in developing ways to block infection and to prevent viruses replicating and causing disease. The management of chronic viral diseases requires new drugs and diagnostic tools. Research within the centre investigates new drug targets at the molecular level.

**HIV-associated Neurological Disorders**

The Wright Group is focused upon HIV-associated neurological disorders in diverse international settings. We have undertaken important epidemiological work on NeuroAIDS in both Asia and the Pacific, leading the international SMART Neurology Substudy that examined the neurocognitive performance of HIV-positive patients randomised to receive continuous versus intermittent treatment for HIV infection. We found that cardiovascular risk factors correlated strongly with poor neuropsychological performance. As a result, we recommended that patients be screened and treated for cardiovascular risk factors and disease to offset any potential contributory effects upon their cognition.

**Identifying New Therapeutic Targets**

The Viral Fusion Laboratory investigates how two major human pathogens, HIV and hepatitis C virus (HCV), attach to and enter cells. Proteins on the surface of viral particles mediate attachment to cellular receptors and then fusion of the virus and cell membranes, which are essential steps leading to viral entry. Understanding these processes at the molecular level enables us to identify ways in which we can block viral attachment and membrane fusion using antiviral agents. It also enables us to design novel vaccines based on the viral surface proteins to elicit an antibody response capable of blocking attachment of viruses to cells. We successfully used this approach to synthetically construct a modified form of the HCV attachment protein and showed that it elicits a neutralising antibody response that can prevent infection with HCV in in vitro studies. This modified form of the HCV attachment protein is now a lead vaccine candidate, and further studies will examine its potential for use as an HCV vaccine.

**The Life Cycle of HIV**

The HIV Molecular Pathogenesis Laboratory, headed by Associate Professor Paul Gorry, aims to understand the very earliest steps in the life cycle of HIV, namely how the virus interacts with cellular receptors and epidemiologists joined our Centre for Immunology, significantly increasing the institute’s expertise focused on the global health issues associated with malaria.
to enter cells. We are demonstrating how alterations in this process accelerate the destruction of CD4+ T-cells in HIV-infected people and how this also renders macrophages susceptible to infection. Moreover, we study how alterations in the way HIV engages cellular receptors facilitates viral escape from new drugs that block virus entry.

Developing the Burnet AX-2 CD4 Test Reader

Associate Professor David Anderson and Professor Suzanne Crowe have continued development of a rapid point-of-care test for measurement of CD4+ T-cells in HIV-infected patients – an essential tool for management of drug therapy. A major focus during 2010 has been the development of the Burnet AX-2 CD4 test reader, together with Melbourne-based Axxin. This simple robust instrument provides enhanced accuracy for samples near the assay cut-off, and allows for improved quality control in assay design and manufacturing.

The Central Nervous System as a Viral Reservoir

The major obstacle to eradicating HIV-1 is the ability of proviral DNA to persist latently in cellular reservoirs. Resting memory T-cells are the best characterised HIV-1 reservoirs, but other cells such as astrocytes in the brain are also latently infected. Unique regulatory mechanisms directing HIV-1 persistence in astrocytes, and the critical nature of these cells for maintaining normal brain function, pose important challenges to strategies that aim to completely eradicate HIV-1 from the body. Led by Dr Melissa Churchill, the HIV Neuropathogenesis Laboratory aims to understand the mechanisms by which HIV-1 infects the brain and persists in the central nervous system.

Growth of Influenza B Viruses for Vaccine Use

Seasonal vaccines against influenza usually consist of the surface antigens of specific epidemic strains of influenza A of the H1N1 and H3N2 subtypes, and influenza B viruses. The growth of seasonal influenza A viruses can be improved by the inclusion of certain genes in the virus. Unfortunately, a similar approach is difficult to achieve with influenza B viruses. Several reports have suggested the use of adaptation to growth at lower temperatures (25°C; cold-adaptation) as a means of enhancing influenza B virus yields. In this project, supported by CSL Ltd, the properties of recent influenza B viruses were compared under different growth conditions to identify reasons for erratic growth in eggs. Several high-yielding, cold-adapted strains continue to be examined by the Tannock Laboratory as potential high-yielder donor strains in the preparation of vaccine reassortants.

Centre for Immunology

The Centre for Immunology’s mission is to develop novel ways to prevent or treat major infectious diseases, cancers, and autoimmune diseases. The centre brings together outstanding research groups and integrates fundamental and applied research programs to understand the way the immune system functions in health and disease. This knowledge is used for the development of novel treatments and vaccines for major human diseases.

HIV-1 Interactions with Macrophages

A cross-cutting collaboration between the laboratories of Dr Paul Ramsland and Associate Professor Paul Gorry has established a computational approach for predicting three-dimensional structures of an HIV-1 surface glycoprotein, gp120, which mediates entry into cells. Dr Jasminka Sterijevski and Michael Roche (PhD student) examined the structural mechanisms for engagement of the host receptors (CD4 and co-receptors CCR5 and CXCR4) by a series of gp120 variants isolated from HIV-1 infected people. The initial experiments examined the capacity of the gp120 variants to mediate CCR5-dependent viral entry into human monocyte-derived macrophages (MDM). This finding suggested that the gp120 interaction with CCR5 may differ in strength or architecture between different primary HIV-1 isolates. The capacity of gp120 to tolerate mutations at key positions of CCR5 was tested and compared against viral entry into MDM. Critical sites were found to be located in the N-terminal region (first segment of the protein) and the extracellular loop region 2 of the coreceptor. Our ongoing structure–function studies should lead to a detailed structural understanding of viral cellular entry and pathogenesis.

Production of Interferon-λ by DC Subsets

Dendritic cells (DCs) sense pathogen invasion via specific receptors expressed on the surface and inside the cells, known as pattern recognition receptors (PRR). Dr Meredith O’Keeffe and her group have further clarified exactly what PRR are expressed by DCs by analysing the proteome (entire suite of proteins) expressed by different subsets of DCs, in collaboration with colleagues in Munich at the Max Planck Institute for Biochemistry and Bavarian Nordic GmbH. They have also shown that a particular type of DC (CD8+ in mice and CD14+ in humans) is a major producer of interferon-lambda (IFN-λ) in response to viral RNA. These DCs are known to be important in inducing potent T-cell responses in viral infections. IFN-λ has been shown to play an important role in protection against mucosal viral infections and may be important for clearance of hepatitis C infection and the cells that make IFN-λ have been ill-defined. We are now investigating how IFN-λ production by these DC subsets may promote or otherwise affect the immune response to infection.

A Role for NFκB1 in Immune Homeostasis

Mice lacking the NFκB1 gene, which is involved in cell signalling within the haematopoietic compartment, develop a lymphoproliferative disease with features that resemble autoimmune disease. Seven months after the transfer of NFκB1-deficient haematopoietic stem cells into normal wild-type host mice, 95 percent of mice developed a multi-organ lymphoid infiltrate resembling the human autoimmune condition systemic lupus erythematosus. Characterisation of these responses revealed a marked increase in specific immune cells (B-cells and CD4+ T-cells) in organs such as the liver, lungs and pancreas. In all cases tested to date, autoantibodies were detected in the sera of mice lacking NFκB1 within the immune system. Collectively, these observations reveal a vital role for NFκB1 in maintaining the normal integrity of the adaptive immune system, as the absence of this regulatory protein may lead to development of a severe autoimmune-like disease.

Designing New Vaccines and Therapies

Professor Geoff Pietersz and colleagues are involved in the design of novel drug and vaccine delivery systems for viral infections and cancer. They have successfully validated a new composition of their cancer vaccine, MFP, in animals and in vitro human cell culture. An approach involving the mixing of mannan with whole inactivated influenza vaccine developed by the group has been further optimised using an intramuscular/intranasal prime-boost immunisation strategy.
designed to enhance immune responses at mucosal surfaces like the lungs. Membrane translocating peptides were also successfully used to deliver multiple antigenic tumour peptides and confer protection to mice from tumour challenge. Furthermore, they have utilised a small chemical entity that activates an intracellular signaling pathway to increase the immunogenicity of DNA vaccines.

**Immune Responses in Hepatitis C Virus Infection**

It is still not understood why some people when infected with HCV are able to quickly clear the infection, while others go on to life-long infection and serious complications. Recent studies have shown that IFN-λ may be a critical factor in affecting this outcome and may influence the generation of effective immune responses. In collaboration with institute colleagues, Associate Professor Rose French and her group have studied immune responses and IFN-λ production in the Networks cohort of young injecting drug users. They have shown clear differences in the nature of the immune responses generated in those that resolve HCV infection compared to those with chronic infection, and further studies aim to elucidate the mechanism behind these differences.

**Dendritic Cell Development**

Studies by Professor Vasso Apostolopoulos and her lab have revealed that reactive oxygen species (ROS) may be responsible for the development of DCs, which play key roles in immune responses. ROS have been implicated in various physiological activities; however, their role in DC activation and generation had not been investigated. Induction of ROS correlated with inflammatory DC and functionality.

**Infection, Cancer and Autoimmune Diseases: Identifying New Therapies**

A newly discovered white blood cell type, Th17, may have major roles in infection, cancer and autoimmune diseases. These cells normally fight infection but also appear to promote destructive inflammation in autoimmune disease or inflammation that assists cancer cell growth. Professor Mark Hogarth and colleagues aim to identify new therapies and understand mechanisms of disease development. They isolate Th17 cells from mice expressing human Fc receptors that develop destructive autoimmunity and from patients with inflammatory autoimmune diseases like rheumatoid arthritis or lupus.

Studies in mice suggest that infection may trigger a series of events leading to the development of Th17 cells that results in arthritis and a lupus-like syndrome. Indeed, changes in white blood cell hormone levels, especially IL 21 and IL 23, are part of this process and precede disease. In patients, and with the CRC for Biomarker Translation, they have analysed 34,000 genes and surface proteins from Th17 cells to find unique molecules associated with disease that can be targeted for novel therapies that eliminate these cells in arthritis, lupus and cancer.

**Centre for Population Health**

The Centre for Population Health (CPH) improves the health of the community by conducting high-quality, policy relevant and innovative research into major public health problems associated with infectious diseases, drug use and related behaviours. Specific interests include HIV, hepatitis C, sexually transmitted infections (STIs), malaria, tuberculosis, drug and alcohol misuse and justice health – all serious health concerns in Australia and in the Asia and Pacific regions predominantly affecting highly vulnerable populations.

**Chlamydia trachomatis**

*Chlamydia trachomatis* is an STI predominantly affecting young heterosexual men and women, with over 74,000 new notifications in Australia in 2010. CPH aims to reduce the impact of chlamydia by reducing transmission and increasing the number of young people tested and treated. As part of this work, CPH explores the use of new technologies such as mobile phones and social networking websites for health promotion.

**Scaling up Diagnosis and Treatment of Drug-resistant Tuberculosis in Khayelitsha, South Africa**

Tuberculosis bacteria, resistant to commonly used antibiotics, are causing increasing morbidity and mortality in resource-poor settings. Although different drugs can be used to treat drug-resistant tuberculosis (DR-TB), treatment continues for almost two years, side effects are common and treatment outcomes remain poor, particularly among HIV-infected individuals. There are also significant problems with access to diagnosis for DR-TB. Working collaboratively with Médecins Sans Frontières in the large township of Khayelitsha, South Africa, Burnet epidemiologist, Dr Helen Cox has helped to integrate DR-TB diagnosis and treatment into the primary care health system through a more patient-centred approach. Key successes include diagnosis and treatment of approximately half of the estimated cases in Khayelitsha, a dramatic improvement on the three percent global figure. The program demonstrates that most patients with DR-TB can be diagnosed and treated at local primary care clinics, thus avoiding expensive hospitalisation.

**Health Intervention for Adult Ex-prisoners**

The Passports project (Passports to advantage: health and capacity building as a basis for social integration) is led by Dr Stuart Kinner, head of the Centre for Population Health’s Justice Health research program. Passports is the world’s first randomised clinical trial in its field, and aims to evaluate the impact of an innovative health and psychosocial intervention package for adult prisoners being released to the community in Queensland.

Major research foci are post-release physical and mental health and risk behaviours, access to and use of health services, and the incidence and timing of recidivism. Over 1,300 prisoners were recruited into the cohort, and are being re-interviewed approximately one, three and six months post-release. We anticipate that Passports will lead to significant gains in our knowledge of how to improve the health of Australian ex-prisoners, a large and growing population.

**Malaria**

Scientists working in the Gilson/Grubb Malaria Laboratory are interested in how malaria parasites attach to and then invade red blood cells.
blood cells (RBCs) in order to develop new drugs and vaccines that block invasion. They study the parasite surface protein, AMA1, that helps the parasite strongly and irreversibly attach to the RBC surface. They have discovered that the short stubby tail of AMA1 that pokes back inside the parasite needs to be modified by one of the parasite’s kinase enzymes before RBC invasion will occur. If the AMA1 tail modification is blocked, then the parasites can attach to but cannot invade the RBC. This is a novel and important finding and was recently published in a high profile parasitology journal. The group believes that the modification of the AMA1 tail is part of a complex chain of signal transduction events that help parasites make decisions about which cell types to invade and when.

Drug Reporting Systems – IDRS/EDRS
Since 2008, Burnet Institute has run the Victorian arms of the Illicit Drug Reporting System (IDRS) and the Ecstasy and Related Drugs Reporting System (EDRS) in partnership with the National Drug and Alcohol Research Centre. This work provides important surveillance information on patterns of drug use and related harms in Victoria using standard methods that have been applied since 1997 (IDRS) and 2003 (EDRS). These methods include a survey of people using particular types of drugs, interviews with key experts and analysis of secondary data sources. The importance of these systems in picking up new trends in drug use is highlighted by the 2010 Victorian EDRS, through which a large increase in the use of the drug mephedrone (street name: miaow miaow) was documented for the first time in Victoria.

Hepatitis C
Our research into HCV continued largely through our ongoing Networks study and the development of models for the integrated management of hepatitis C in the community. Since commencing in 2005, Networks researchers have followed a cohort of people who inject drugs (the major risk group for HCV infection in Australia) with the primary aim being to better understand the transmission of hepatitis C. Important findings include the identification of very high rates of hepatitis C reinfection and associations between the probability of an individual being infected with hepatitis C and the nature of their injecting network.

Centre of Research Excellence in Injecting Drug Use
CPH successfully applied to NHMRC to establish a Centre of Research Excellence in Injecting Drug Use (CREIDU). CREIDU brings together Australia’s leading researchers on injecting drug use (IDU), along with partners and key experts from the non-government sector and policy sectors, to generate new evidence on ways to ameliorate the health and social burden of IDU. With a focus on translating research into policy and practice, CREIDU aims to reduce the key harms associated with IDU by identifying ways to reduce blood-borne virus transmission (particularly hepatitis C), prevent overdoses, and improve justice health and psychiatric health.

Informing HIV Prevention
Burnet Institute has conducted HIV surveillance for the Victorian Department of Health since 1986. In 2010, after four years of historically high annual HIV notifications, new diagnoses of HIV in Victoria declined by 15 percent to 228. An increasing proportion of these notifications were newly acquired in the past 12 months. These data suggest that health promotion activities designed to increase HIV testing, particularly among gay men, may be having an impact. This outcome is supported by Burnet’s evaluation of HIV prevention initiatives in Victoria. In a report provided to the Victorian Government in 2010, Burnet staff outlined their findings that recent social marketing campaigns were successful in raising gay men’s awareness of the importance of testing and prompted a meaningful proportion to present for HIV testing. Burnet’s sentinel surveillance data also showed a significant increase in monthly HIV testing rates among gay men attending high caseload clinics over the campaign period.

Centre for International Health
The Centre for International Health (CIH) leads practical action to improve the health of people in low-income countries. Our expertise spans HIV prevention and care, women’s and children’s health, sexual and reproductive health, drug use, primary health care, strengthening national health systems, and education about all these fields. We work with local communities, governments, the UN system and international organisations including Australia’s development agencies. We have overseas offices in Papua New Guinea (PNG), Indonesia, Lao PDR, Myanmar (Burma), China (including Tibet), Mozambique and Thailand and also work in other countries through Burnet’s local partners.

CIH staff members were engaged to help develop: HIV strategic plans in Fiji, Solomon Islands, Federated States of Micronesia, and Marshall Islands; a national plan to prevent and control emerging infectious diseases in Vietnam; and a national health promotion policy in Samoa. We led a review of the Australian-funded Pacific Malaria Initiative and are in the process of designing a second phase of the program. Our staff also designed a new Clinton Foundation program focusing on AIDS in children in PNG. Burnet staff were active in a number of regional and global harm reduction networks and provided technical assistance to the Tanzanian Government to reduce the HIV risks associated with the escalating wave of injecting drug use in Zanzibar. The centre’s HIV prevention work included an innovative sexual network modelling study of bisexual men in Vientiane and Hanoi.

As a partner in the AusAID-funded Women’s and Children’s Health Knowledge Hub, CIH undertook research to: analyse the barriers and enablers to adolescents accessing sexual and reproductive health information and services in Vanuatu; develop competencies for community health workers to provide quality services to adolescents; identify effective community interventions to save the lives of mothers and babies; increase the counselling and communication skills of maternal care providers; and assess health systems interventions for improving access to maternal and child health services in urban areas of the Philippines.

With AusAID, Burnet co-hosted a roundtable on developing a maternal and child health strategy. Burnet also hosted a technical consultation, sponsored by the WHO, on best practices and tools for preventing Lao women and children benefit from Burnet’s maternal and child health projects.
perinatal transmission of hepatitis B. CIH staff members were on the organising committee for the annual UN-DPI NGO conference held in Melbourne in September, and the institute co-sponsored a conference workshop on the unfinished agenda of sexual and reproductive health rights. Burnet hosted 16 participants from India, Mongolia, Sri Lanka, Indonesia, Fiji and Malaysia for a three-week program on healthy ageing, with the aim of establishing a Healthy Ageing Research Hub for Asia and the Pacific. Professor Mike Toole, Head of CIH, was appointed by the Director-General of the WHO to the Independent Monitoring Board of the Global Polio Eradication Initiative.

Myanmar (Burma)

Burnet has successfully completed the first year of co-implementation with three community-based partners to provide antiretroviral therapy to HIV-positive people with clinical AIDS. In collaboration with Myanmar Interfaith Network on AIDS, Burnet co-facilitated workshops to develop a common platform among religious organisations to respond to HIV and AIDS in communities, and from this, four religions reached a consensus on caring for people living with HIV with loving kindness and preventing stigma and discrimination against vulnerable people. To commemorate World AIDS Day, Burnet, in conjunction with Myanmar Anti-Narcotics Association, hosted an event named ‘HIV/AIDS Knowledge Quiz with Celebrities and Entertainment’. The event attracted an audience of more than 1,000 people from all walks of life.

China (including Tibet Autonomous Region)

China-Australia Health and HIV/AIDS Facility (CAHHF) is now in its fourth year of implementation. The continued tightening of CAHHF’s strategic focus towards funding policy-oriented research relevant to China’s current health reform process has ensured the facility remains highly relevant to China’s national health priorities. The AusAID-funded Tibet Health Sector Support Program (THSSP) concluded in June 2010 after six years of operation, having successfully contributed to significantly strengthened health systems in the Tibet Autonomous Region of China, in the areas of HIV testing and counselling, STI testing and treatment, development of clinical management protocols, strengthened approaches to health promotion and outreach, and the first prevalence survey in the region covering HIV and other STIs. Burnet successfully negotiated the continuation of the Cooperation Agreement that allows us to continue our important work in Tibet.

Indonesia

In May 2010, Burnet, along with other consortium members, was awarded a five-year USAID project for ‘Scaling Up for Most-At-Risk Populations: Organisational Performance (SUM II)’ which focuses on improving organisational performance to expand coverage of effective, integrated HIV interventions that lead to substantial and measurable behaviour change among most-at-risk populations, such as sex workers, men who have sex with men (MSM) and people who inject drugs. Two programs concluded in 2010, including ‘Capacity Building for Local Responses to HIV Among Injecting Drug Users in Bekasi, West Java’. The evaluation showed that there is a marked increase in awareness of health risks and willingness to adopt harm reduction measures; however, there remains a reluctance to access public health services.

Sri Lanka, Vietnam and Malaysia

Burnet maintains its presence through partnerships in Sri Lanka (improving the health and well-being of elders), Vietnam (harm reduction and a sexual networking study) and Malaysia (harm reduction).

Mozambique

For more than 11 years, Burnet’s work in Mozambique has focused on building the capacity of local non-government organisations that provide vital services to very poor communities grappling with the impact of the HIV epidemic. These services typically include: counselling; home-based care for the sick, and care and support of orphans and other vulnerable children. Burnet has taken an intensive approach to capacity building and worked closely with 30 organisations in Manica Province to maximise the potential for positive change. We established and educated a local team to train and mentor the 30 organisations in a range of topics, according to their needs.

Papua New Guinea

Burnet completed its management of the AusAID-funded Tingim Laip HIV prevention project and entered a new phase including relocation of headquarters to the School of Medicine and Health Sciences, University of PNG. The East New Britain Sexual Health Improvement Project continues to strengthen the capacity of local services and communities to prevent and treat STIs. Positive outcomes associated with this project include reported shifts in religious and cultural beliefs and values relating to sexual health issues; strengthened relationships between health workers and community advocates (Stret Tokers); and individual behaviour change, such as health care-seeking behaviour, condom use and a reduction in the number of sex partners.

Lao People’s Democratic Republic

During its 12 years of operations, Burnet’s Lao office has developed a niche area of work in peer education with MSM. Further peer education programs also include sex workers and youth, funded by the Australian government, Global Fund and other donors. A major focus of effort in 2010 was a large regional infrastructure initiative funded by the Asian Development Bank. This project has developed provincial and district HIV prevention teams consisting of representatives from different government sectors that are responsible for project implementation. The teams work with youth in villages along a new highway and also with private sector employees. Initial findings show a strong increase in HIV knowledge across all target settings. Funded by an Australian government development research grant, Burnet conducts innovative research that identifies network maps of sexual relationships in Vientiane and demonstrates how even individuals deemed as being in low risk categories are directly linked to high risk categories such as MSM.

Pacific Program

Burnet engaged with a number of Pacific countries through operational research and capacity development in the fields of drugs and alcohol, adolescent sexual and reproductive health, and infectious diseases. The Pacific Drug and Alcohol Research Network maintained its research capacity-building focus, and in February, the Australian National Council on Drugs launched Burnet’s report ‘Situation Analysis of Drug and Alcohol Issues and Responses in the Pacific 2008-09’.

The Women’s and Children’s Health Knowledge Hub partnered with Vanuatu-based NGO, Won Smol Bag, to conduct operational research exploring barriers to accessing sexual and reproductive health services. Burnet continued to support HIV programming through partnerships with regional agencies, such as the Secretariat of the Pacific Community, governments, and civil society in five Pacific countries reviewing and developing national strategies to respond to HIV and STIs. Preliminary work to establish research on HIV prevalence in Fiji’s prisons was completed.

Postgraduate Students

| 46 PhD Students |
| 11 Masters Students |

Publications

| 159 Journal Articles |
| 1 Book |
| 2 Book Chapters |
| 6 Comissioned Reports |
Donor Heart Preservation
Improved techniques of preservation can enhance the current results of cardiac transplantation and reduce the incidence of primary graft failure once a transplant has been done. Primary graft failure often necessitates the use of mechanical support for the heart to allow the patient to survive and recover. Improved preservation may also allow the use of a new source of donor hearts, namely donation after cardiac death (DCD) hearts. DCD donors are patients who have technically died because of cessation of heart beat followed by brain death. However, with improved techniques it may be possible to restart the heart, revive it and subsequently use it as a transplant. Our new technique of preserving transplant hearts is to perfuse them continuously between donation and transplantation with a novel protective solution. We have shown that perfusion preservation is highly superior to conventional storage in ice.

Integrative Medicine
Improving cardiothoracic surgery patients’ pain and anxiety after surgery has been the main focus in 2010. A randomised study comparing massage therapy delivered on the wards to an equivalent period of rest time was conducted. The study also determined feasibility of providing such a service on a busy ward and assessed patient and staff satisfaction with the intervention.

Major Findings
We have shown that preservation of donor hearts by perfusion is superior to the conventional technique of cold storage. This perfusion enables prolonged preservation of normal donor hearts and resuscitation of donation after cardiac death hearts.

We have shown that massage given to patients after cardiac surgery significantly reduced perceived pain, anxiety and muscle tension and induced relaxation and increased patients’ hospital experience when compared to an equivalent amount of rest time. In particular, a highly significant 52% reduction in pain was reported after a 20 minute massage delivered to patients on days 3 or 4 after surgery. A significant reduction in pain was also observed when massage was applied on days 5 or 6, thereby confirming the original result. Acceptance of the therapy by nurses and physiotherapists was excellent. Over the study period, an additional 91 referrals were made for the massage service, predominantly by physiotherapy staff, indicating an unmet need for this therapy.

Due to the significant benefits of massage therapy on pain, anxiety, muscle tension and relaxation, and interest from nursing and physiotherapy staff to implement a service, we have been negotiating with Endeavour College to provide massage to patients free-of-charge. We have developed a 2-day induction program for potential massage therapists to provide orientation to cardiac surgery, the cardiothoracic patients needs and medications, working in a hospital environment and OHS issues. Massage therapists will be supervised by an experienced supervisor with experience working at The Alfred hospital. This will directly translate the research findings into practice and shortly benefit patients.

Current Projects
- Donor heart preservation by perfusion – Franklin Rosenfeldt
- Heart donation after cardiocirculatory death – Franklin Rosenfeldt
- Cardiac Wellness Project – Lesley Braun and Franklin Rosenfeldt
- Rib plating for chest trauma – Silvana Marasco
- Stress reduction after cardiac surgery by massage – Lesley Braun
- Evaluation of carbon dioxide insufflation during cardiac surgery – Silvana Marasco

Postgraduate Students
- 2 PhD Students
- 2 Masters Students

Publications
- 20 Journal Articles
- 1 Book
- 4 Book Chapters
Research activities in the Department of Cardiovascular Medicine span the continuum from prevention and early disease detection to the management of end-stage cardiac disease. A particular feature in recent years has been the growth in research in the cardiac catheterisation laboratory particularly in relation to the evaluation of devices of which some have originated through work at AMREP. In addition, there has been expansion in research into novel cardiac imaging, particularly cardiac MRI and CT angiography.

**Effects of Good Cholesterol**

In relation to prevention and risk factor management, work has continued on the effects of HDL (good) cholesterol and the metabolic and inflammatory changes which accompany obesity. Collaborative studies between Professor Anthony Dart and Professor Jaye Chin-Dusting at Baker IDI have examined some of the inflammatory and endothelial changes which accompany severe obesity and their amelioration by treatment. These studies have focused on novel findings with endothelial microparticles and have demonstrated that obese individuals have higher levels of these particles in the blood than do their lean counterparts, indicating the presence of damaged vascular endothelium.

Professor Bronwyn Kingwell and colleagues have demonstrated that reconstituted HDL infusion inhibits fasting-induced fat breakdown and oxidation in patients with Type 2 diabetes, potentially through both AMPK activation in adipose tissue and elevation of plasma insulin.

**New Hypertension Treatment**

Research into hypertension has concentrated on the management of patients who remain substantially hypertensive despite the use of multiple medications. A major finding in this area has been in relation to percutaneous renal denervation, with a first in man clinical trial led by Professor Henry Krum, Professor Murray Esler and Dr Tony Walton demonstrating this as a promising new approach to an intractable clinical condition. The procedure requires percutaneous placement of a catheter in the renal nerves, with subsequent radiofrequency induced interruption of the renal sympathetic nerves. The recent trial with the ARDIAN innovation device in such patients has been important and has indicated that blood pressure control may be achievable through this procedure.

In addition to clinical evaluation, this research has further examined the basic physiological mechanisms underlying the benefit from this procedure with evidence suggesting that both efferent and afferent renal sympathetic nerves may be contributing to the elevated pressures. This work has featured in publications in *The Lancet* and *New England Journal of Medicine*. Expansion into other fields where exaggerated renal sympathetic function is a likely factor is currently under way. In particular, it will include a major study into the effects of renal denervation as a possible treatment for heart failure, led by Professor David Kaye.

**Coronary Artery Disease**

Work in relation to coronary disease has concentrated on acute coronary syndromes and the management of acute myocardial infarction. Dr Stephen Duffy and Dr William Chan have completed a major trial into the effect of iron chelation on outcomes after primary angioplasty in patients presenting with an ST elevation acute myocardial infarction. The project has utilised cardiac MRI to estimate myocardial infarct size and to measure cardiac remodelling over the subsequent three months.

Using a lipidomic approach, eight plasma lipids have been identified from over 300 candidates which accurately distinguish unstable from stable coronary artery disease presentation in a study in collaboration with Associate Professor Peter Meikle at Baker IDI. In the next phase of these studies it is planned to examine prospectively the ability of this lipid subset to predict which patients with coronary disease are likely to present with myocardial infarction or unstable angina.

In other studies, Dr Karen Lu Fang and Professor Anthony Dart have demonstrated differences in circulating fibrocytes between patients with stable and unstable coronary disease. These may not only then serve as potential biomarkers but may also contribute mechanistically to the explanation of why some atherosclerotic plaques become unstable.

The department continues to be a major contributor to the Melbourne Interventional Group. Research from this group has identified peri-procedural atrial fibrillation as a poor prognostic sign in patients undergoing angioplasty. In addition, current studies are evaluating the outcome of patients treated with an intra-aortic balloon pump during emergency angioplasty. The ability of novel biomarkers to predict peri-procedural myocardial infarction in patients undergoing major vascular procedures has also been undertaken in a collaborative project with the Department of Vascular Surgery.
Antiplatelet Therapy
Research has also continued into evaluation of antiplatelet therapy, in particular its potential interactions with concomitant medications such as proton pump inhibitors. The problem of contrast-induced nephropathy has been studied with preliminary results from a newly developed device to effectively remove contrast from the circulation. Again, this resulted from an original development at AMREP from the work of Professor David Kaye.

Percutaneous Aortic Valve Replacement
In other work originating from the cardiac catheterisation laboratory, Dr Tony Walton and Dr Stephen Duffy have continued to evaluate the benefits of percutaneous aortic valve replacement contributing substantially to local and international research in this area. The catheter laboratory at The Alfred was the first in Victoria to undertake this procedure, which looks a promising alternative to cardiac surgery for aortic valve replacement in the elderly.

Cardiac Imaging
Research into cardiac imaging has continued particularly in cardiac MRI with the more recent initiation of research into coronary CT angiography. A particular finding in relation to cardiac MRI is the demonstration in subjects with heart failure that the likelihood of significant ventricular arrhythmias in patients considered for implantable defibrillators can be predicted from the extent of cardiac fibrosis detected by MRI. Multispectral cardiac MRI was used to detect acute and chronic rejection in heart transplant recipients, and also to predict response to cardiac resynchronisation therapy in heart failure patients. Given both clinical and research application for cardiac MRI, the department is fortunate to have recruited Dr James Hare, a second cardiologist with extensive experience and training in this modality, to complement the work of the head of this service, Dr Andrew Taylor.

Atrial Fibrillation
Associate Professor Peter Kistler continues to lead research in clinical arrhythmia development particularly atrial fibrillation and its relation to the development of heart failure and its management. An intriguing study completed during the year demonstrated that atrial fibrillation is rare in patients who had undergone double as opposed to single lung transplantation, reinforcing the need for complete pulmonary vein isolation when pulmonary vein isolation is used as a therapeutic modality.

Extensive collaboration between Professor Anthony Dart, Dr Silvana Marasco from the Department of Cardiothoracic Surgery and the laboratory of Associate Professor Liz Woodcock at Baker IDI has been evaluating the role of signalling molecules in the inositol pathway to the development of atrial fibrillation. Current studies in this translational research are concentrating on microRNAs – important regulators of gene function.

Cardiovascular Disease and HIV Infection
A particular feature of research in the department is close links with neighbouring AMREP partners, particularly the basic laboratories at Baker IDI and the Burnet Institute. A number of projects have evolved as collaborations with HIV researchers on the campus, reflecting the growing importance of cardiovascular disease to the natural history of HIV infection. The enhanced cardiovascular risk in this particular cohort likely reflects an enhanced inflammatory state. Collaborative studies with Professor Jennifer Hoy and colleagues in the Infectious Diseases Unit have been addressing this.

Clinical Trials
The department continues to contribute to a large number of externally originating clinical trials, including both commercial and non-commercial, and is fortunate to have a number of experienced and committed clinical trial nurses. Current trials include the exciting new approach of alternatives to warfarin in patients requiring anticoagulation, novel anti-inflammatory drugs in patients with unstable coronary disease, heart rate lowering medications in patients with stable coronary disease and new lipid lowering drugs. In addition the department contributes data to a number of studies involving new devices.

Major Achievements
In addition to the major findings already presented, researchers in the department have also achieved a number of noteworthy research related outcomes. Professor Dart and colleagues have been awarded a further NHMRC Centre of Research Excellence for five years for Training in Translational Cardiology. This is the third consecutive quinquennium in which investigators from the department have received this or a similar award.

Professor Dart is also an investigator with Associate Professor Dmitri Sviridov from Baker IDI on a new NIH grant in relation to atherosclerosis and HIV. Dr Jonathon Habersberger won the prestigious Ralph Reader Prize at the annual meeting of the Cardiac Society of Australia and New Zealand for his work under the supervision of Professor Karlheinz Peter. Dr Dani Michel’s work on the effect of high blood pressure on the adhesion of leukocytes to the vascular endothelium won first prize at the High Blood Pressure Council of Australia annual meeting. Dr James Hare has been the recipient of a CSANZ fellowship. Dr Peter Kistler has been appointed as an Associate Professor by the University of Melbourne. Himawan Fernando (BMedSc student) was awarded an H1 for his year’s work under the supervision of Dr James Shaw.

Postgraduate Students
19 PhD Students
1 MD Student

Publications
75 Journal Articles
The Centre for Obesity Research and Education (CORE) is dedicated to understanding and optimally managing the chronic disease of obesity, and measuring the effects of weight loss on health, quality of life and survival. CORE is unique in applying a multidisciplinary approach to the study of obesity, which integrates a major clinical obesity management program with strengths in clinical research, clinical epidemiology, public health, basic sciences and professional and community education. Through this integration, CORE is able to measure the health consequences of obesity, along with the unique capacity to evaluate the health benefits of weight loss.

Research Areas
CORE is, first and foremost, a research centre. Research is central to its mission and its clinical research capability is what sets CORE apart from most other similar research groups.

Basic Research
- Weight regulation – appetite control and energy expenditure
- Mechanisms of obesity related diseases

Clinical Studies
- Randomised controlled trials
- Observational studies
- Optimising therapy
- Measuring outcomes – health, quality of life and survival

Public Health
- Population health
- Prevention of obesity – secondary
- Health impact of weight loss
- Epidemiological modelling
- Cost-effectiveness and health economic studies

Awards
Mr Paul Burton – Royal Australasian College of Surgeons (RACS) Postdoctoral Fellowship
Dr Lisa Doyle – NHMRC Postgraduate Scholarship and RACS Foundation for Surgery Research Scholarship

Major Findings
- Adolescent study published in the Journal of the American Medical Association, the first randomised controlled trial of bariatric surgery versus conservative therapies in an adolescent population
- Physiology and pathophysiology of the LAP-BAND: a series of studies exploring the role of the oesophago-gastric junction on satiety
- The real incidence of depression and the utility of the Beck Depression Index in obese patients seeking bariatric surgery

Current Projects
- Type 2 diabetes and BMI 25-30 randomised controlled trial (RCT) (Professor Paul O’Brien)
- Physical activity and weight loss in laparoscopic adjustable gastric banding (LAGB) patients RCT (Kristine Egberts)
- Optimised nutrition program for weight loss in LAGB patients RCT (Kristine Egberts)
- Meal frequency, weight loss and dietary satisfaction in LAGB patients RCT (Kristine Egberts)
- Liquid versus solid nutrition study (Kristine Egberts)
- Cohort study of changes in metabolic syndrome with weight loss (Dr Lisa Doyle)
- Indigenous diabetes study (Professor Paul O’Brien)
- Survival study (Dr Anna Peeters)
- Intensive care study (Professor Paul O’Brien)
- Knee pain study (Dr Peter Baquie)
- Impact of treatment of obesity on cancer incidence and survival (Dr Sarah Birks)
- Psychological assessment study (Dr Melissa Hayden)
- Change in BDI factor scores (Dr Melissa Hayden)
- Anti-depressant medication study (Dr Melissa Hayden)
- Predictors of attrition in weight loss interventions (Dr Leah Brennan and Irina Moroshko)
- Nuclear medicine study: gastric emptying (Mr Paul Burton)
- Upper gastrointestinal symptoms study (Mr Paul Burton)
- Video manometry study (Mr Paul Burton)
- Physical activity and weight loss in LAGB patients – systematic review (Kristine Egberts)
- Erosions after LAP-BAND surgery – systematic review (Kristine Egberts)
- Nutrition programs for weight loss in LAGB patients – systematic review (Kristine Egberts)
- Cardiac study (Professor Paul O’Brien)
- Adipose tissue study (Dr John Wentworth)
- Obesity as an auto-immune disease (Dr John Wentworth)
- Cost-effectiveness review: diabetic study (Julie Playfair)
- Cost-effectiveness review: BMI 30-35 (Julie Playfair)
- Cost-effectiveness review: adolescent study (Cheryl Laurie)

Associate Professor Wendy Brown became Director of CORE in late 2010.
The Clinical Pharmacology Unit provides drug-related services to The Alfred, including advice to and membership of the Drug and Therapeutics Advisory Committee and the Human Research Ethics Committee, leadership on the Adverse Drug Reactions Committee and consulting on drug and toxicology related clinical problems.

The Clinical Pharmacology Unit has a very active program of basic and clinical research involving evaluation of new and established drug therapies.

Clinical Research
Clinical research is focused on drugs that may affect the cardiovascular system. Agents under current active research evaluation include COX-2 inhibitors, angiotensin receptor blockers, aldosterone receptor antagonists, clozapine and beta-blockers, as well as various experimental agents. Evaluations include assessment of autonomic and endothelial function as well as microcirculation tone in health and disease.

The unit also serves as a coordinating centre for multicentre clinical trials. Current ongoing trials include:

- **ANGLE-HF**: This study evaluates the utility of renal biomarkers in predicting worsened renal function and major cardiovascular events in patients with acute decompensated heart failure.
- **SCREEN-HF**: (SCReening Evaluation of the Evolution of New Heart Failure). The SCREEN-HF study has now recruited all 3,500 elderly (>60 years) subjects with at least one risk factor for heart failure and determined plasma brain natriuretic peptide (BNP) levels. Funding has been secured to longitudinally follow up all subjects for 5 years to assess for new heart failure development, and to randomise the highest BNP quintile to spironolactone versus placebo to lower BNP and reduce heart failure development.
- **Triple R (Reverse Remodelling Resynchronization) Study**: Patients with heart failure may be eligible to receive a biventricular pacemaker (cardiac resynchronization therapy) if they have evidence of dyssynchrony either on ECG or imaging. However, the mechanism by which cardiac function is improved is poorly understood and, furthermore, approximately 30% of eligible patients either have no response or deteriorate with this therapy. This randomised controlled trial seeks to determine mechanisms by which patients improve cardiac function and/or whether certain markers of disease predict non-response.
- **Renal denervation**: Assessment of a novel procedure to denervate renal sympathetic activation in resistant hypertension.
- **INTEGRATE**: Evaluation of a direct renin inhibitor in heart failure.

Basic Research
The unit also conducts a number of basic research programs within the Monash Central Clinical School research laboratories. Current programs include:

- Heart–kidney interactions in cardiac disease
- Role of soluble epoxide hydrolase inhibitors in cardiac disease
- Role of Rho kinase in cardiac fibrosis
- Role of novel agents in cardiac fibrosis and inflammation

**Postgraduate Students**
6 PhD Students

**Publications**
27 Journal Articles
Diagnostic and Interventional Radiology

Director: Professor Kenneth Thomson MD, FRANZCR, FRCR

The Alfred Radiology Department is one of the most advanced radiology departments in Australia and is committed to providing safe, efficient and cost effective diagnostic and interventional radiology services. State-of-the-art facilities include the first completely robotic digital radiography room and the lowest radiation dose computerised tomography (CT) scanner in Victoria. The commitment of our staff is underpinned by excellence and leadership in radiological practice, safety, teaching and academic research. Radiological imaging and minimally invasive image-guided interventional procedures are used across all medical disciplines. With support and governance through the Radiology Research Unit, internal, collaborative and commercially sponsored clinical trials are conducted.

Current Projects

Vascular Intervention
- Evaluation of the CRUX Biomedical™ inferior vena cava (IVC) filter system
- CORAL: Cardiovascular Outcomes in Renal Atherosclerotic Lesions
- 3D rotational angiography in stereotactic radiotherapy planning for arteriovenous malformations (AVMs)
- A randomised study to compare the technical difficulty of retrieval of the Bard G2™ X and the Cook Celect vena cava filter systems
- Percutaneous balloon angioplasty for the treatment of extracranial vein abnormalities in MS patients: a retrospective study
- PROTECT: PROphylaxis of ThromboEmbolism in Critical care Trial
- Splenic embolisation in blunt abdominal trauma
- Uterine vascular malformations
- Post-operative pain management in patients undergoing uterine artery embolisation for symptomatic leiomata
- Follow up of failed retrieval of IVC filters in trauma patients
- Catheter-directed thrombolysis of lower limb thrombosis
- Variant treatment for gastric varices with polidocanol foam using balloon-occluded retrograde transvenous obliteration: a pilot study

Neurovascular Intervention
- Reflection of intracerebral aneurysm identification of multislice computer tomography (64 slice) and digital subtraction angiography
- A Phase 2, multicentre, international, double blind, randomised, placebo-controlled, parallel group, dose finding study for the prevention of cerebral vasospasm after aneurismal subarachnoid hemorrhage by intravenous administration of clazosentan
- The epidemiology of blunt cerebrovascular injury

Trauma
- Correlation between MRI and operative findings in acute cervical spine injury: a retrospective review
- Occipital condylar fractures – incidence and clinical follow up
- Evaluation of the cervical spine clearance process in a level 1 trauma centre
- The incidence and severity of discoligamentous injuries with isolated facet joint injuries (fracture/dislocation) identified on CT scan of the cervical spine – is routine MRI required?
- TBI II protocol fluid resuscitation of critically ill patients with traumatic brain injury: potential mechanisms behind the detrimental effect of albumin resuscitation
- Focused assessment with sonography for trauma
- Persistent midline cervical tenderness after normal CT in alert, neurologically intact trauma patients

Renal Trauma
- Assessing the usefulness of delayed imaging in routine follow-up for renal trauma
- Predictors of outcome in blunt high-grade renal injuries treated with conservative intent
- Review of management of renal trauma

Tumour Ablation and Embolisation
- Irreversible electroporation (IRE) for the treatment of focal liver, kidney and lung cancer: a pilot study
- A Phase 2 randomised, double-blind, placebo-controlled study of sorafenib or placebo in combination with transarterial chemoembolisation for hepatocellular carcinoma

Cancer and MRI
- A prospective, open label Phase 1B study of single dose intravenous KDF-07002 administered as a tumour imaging agent with MRI in male subjects with head and neck cancer
- A review of MRI for rectal cancer reporting in The Alfred: is synoptic reporting required?
- Comparing clinical sigmoidoscopy and MRI measurements for rectal cancer location – is there a correlation?
- Practicalities of MRI screening for women at genetic high risk for breast cancer

Continued on page 37
The Emergency and Trauma Centre has an active research program that covers a broad spectrum of activity and involves collaborations with most inpatient units, the National Trauma Research Institute (NTRI) and the Monash University Department of Epidemiology and Preventive Medicine (DEPM).

Five emergency specialists and one nurse specialist are undertaking doctoral studies and a large number of nurses and doctors are undertaking postgraduate research training. The Emergency and Trauma Centre also takes a leading role nationally in hosting a research training course for emergency trainees. Publications have consistently increased over the last decade.

Major ongoing collaborative research projects with NHMRC research funding include:

• **Australasian Resuscitation in Sepsis Evaluation (ARISE)** – an NHMRC funded randomised controlled trial across more than 40 hospitals involving the emergency and intensive care areas, in collaboration with the Australian and New Zealand Intensive Care Society (ANZICS) research group. The study examines the role of early goal directed therapy in severe sepsis and will take a further two years to complete.

• **POLAR** – an NHMRC funded randomised controlled trial across six hospitals in collaboration with the ANZICS research group to determine the role of hypothermia in protecting patients with traumatic brain injury from further secondary brain injury has commenced enrolment.

• **MEDACT** – an NHMRC funded randomised controlled trial in collaboration with RMIT University across three hospitals. The study, which aims to determine the role of acupuncture in acute pain syndromes presenting to the Emergency Department, has commenced enrolment and is led by Dr De Villiers Smit.

• **HOLTT** – an NHMRC and Traffic Accident Commission funded study in collaboration with the Hyperbaric Unit examines the role of hyperbaric oxygen in lower limb trauma and continues to enrol patients.

• **RINSE** – a prehospital randomised controlled trial in collaboration with Ambulance Victoria assessing the outcomes of early cooling post cardiac arrest. This study has just commenced and will continue the extensive Melbourne based research that has already changed management in this area.

• **Patient Safety** – in conjunction with the DEPM, there has been an emphasis on improving the methodology for measuring and improving patient safety. This has involved research to improve outcomes in trauma, burns and cardiac arrest. Smaller projects have included investigation of human factors in areas such as wrong blood in tube and patient handover.

The Alfred Emergency and Trauma Centre is a leader in international emergency medicine and has received funding to undertake improvements to emergency and trauma care in Sri Lanka, India, China, Singapore, Hong Kong, Malaysia and other nations. A number of collaborative research projects are being undertaken to evaluate these programs.

Collaboration with Ambulance Victoria has been particularly important for the Emergency and Trauma Centre. As well as being involved in a number of large randomised controlled trials, collaborative research with Ambulance Victoria using the Victorian Ambulance Cardiac Arrest Registry (VACAR) has been integral to investigating the epidemiology, management and outcomes of out of hospital cardiac arrest. Dr Conor Deasy, an emergency specialist from Ireland, has undertaken a PhD studying improvements to out of hospital cardiac arrest management in Victoria. His work has involved evaluating outcomes in patients at the extremes of age – paediatrics and the elderly. Conor has also evaluated the impact of the changes to guidelines for resuscitating cardiac arrest victims.

**Patient receives acupuncture in the Emergency and Trauma Centre as part of the MEDACT Study.**

**Diagnostic and Interventional Radiology continued from page 36**

**MRI**

• A Phase 2, randomised, double-blind, placebo-controlled, study to evaluate the safety and efficacy of daunetide for the treatment of progressive supranuclear palsy MRI component

• Aspirin for the prevention of cognitive decline in the elderly: a neuro-vascular imaging study (ENVIS-ion) from ASPREE

**Other**

• The impact of norfloxacin on portal pressure and endotoxaemia and the role of vasoactive mediators in clinically significant portal hypertension

• Osseointegrated prosthesis for the rehabilitation of amputees

**Postgraduate Students**

- 3 PhD Students
- 50 Masters Students

**Publications**

- 33 Journal Articles
- 1 Book
- 1 Book Chapter
Research Activities

Mechanisms of Diabetic Complications
Professor Leon Bach

Patients with diabetes develop complications including damage to the blood vessels, eyes, nerves and kidneys. Although high glucose levels are necessary for the development of these complications, the precise mechanisms remain incompletely understood. Professor Leon Bach’s laboratory is studying the role of proteins that are modified by glucose (advanced glycation end products – AGEs). In particular, his laboratory has identified a novel interaction between AGEs and ERM proteins that are important for maintaining cell shape and function. Current studies are aimed at identifying the role of this interaction in mediating diabetes-induced tissue damage. In 2010, the group studied the relationship between proteases and AGE binding to ERM proteins with a focus on kidney tubule cells. The group also started studying the role of ERM proteins in podocytes, which are cells within the filtering apparatus of the kidney.

Professor Bach has continued a clinical study with Associate Professor Dmitri Sviridov and Associate Professor Merlin Thomas from the Baker IDI Heart and Diabetes Institute to investigate the effects of glucose modification on the anti-atherogenic properties of high density lipoprotein in diabetic patients.

Regulation of Growth Factor Activity
Professor Leon Bach

Insulin-like growth factors (IGFs) are important for normal growth and development, and the IGF system is perturbed in many disease states, including growth disorders, diabetic complications, cancer, and atherosclerosis. A family of six IGF binding proteins (IGFBPs) regulates their actions. For many years, Professor Leon Bach’s laboratory has focused on the biological role of IGFBP-6, particularly its role as an IGF-II inhibitor in cancer. These studies may lead to a new class of therapies aimed at modulating the IGF system, which may be relevant for IGF-dependent diseases.

The group has previously shown that IGFBP-6 promotes migration of cancer cells in an IGF-independent manner. Further work in 2010 has studied a number of intracellular signalling molecules involved in this effect and identified a possible cell surface protein that may also be involved.

Clinical Trials in Diabetes and Thyroid Care
Professor Duncan Topliss

ADVANCE-ON is a long term follow-up of participants in the now-concluded ADVANCE trial in Type 2 diabetes. It seeks to provide evidence of a late benefit (legacy effect) of tight glycaemic control versus standard control in macrovascular disease prevention.

The ORIGIN study is testing the effect of early insulin therapy using the new long-acting analogue glargine insulin to prevent macrovascular disease in Type 2 diabetes. It concludes in 2011 and its results are expected to be presented in mid-2012.

The HOPE study (Phase 2), which concludes in 2011, has examined the effects of a novel VEGF/multikinase inhibitor (E7080) on advanced thyroid cancers and suggests benefit. The Alfred will be a trial site for a Phase 3 randomised placebo-controlled trial of this agent commencing later in 2011.

Diabetes in Lung Transplant Recipients
Dr Kathryn Hackman and Professor Leon Bach

A collaboration has been established with Professor Greg Snell, Head of the Lung Transplant Unit, to document the incidence of diabetes in lung transplant recipients and to study the effects of diabetes on transplant outcomes.

Research Achievements

Professor Leon Bach gave an invited Meet the Professor lecture on ‘IGFs, diabetes and metabolism’ at the 14th International Congress of Endocrinology in Kyoto.

Professor Duncan Topliss gave an invited lecture at the World Congress of Internal Medicine in a seminar entitled Update in Topical Areas of Endocrinology, on ‘Challenges for the general physician in thyroid disease’ and an invited lecture at the Endocrine Society of Australia Seminar Meeting on ‘Thyroid cancer; the challenge of implementing modern guidelines’.

Dr Kathryn Hackman commenced an MD studying the causes and effects of diabetes in lung transplant recipients.
Epidemiology and Preventive Medicine is the largest department within the School of Public Health and Preventive Medicine at Monash University, with a focus towards disease and disability prevention. As one of our long-term goals of strengthening our ‘methodology core’ of epidemiology, biostatistics and data-management, we are progressively increasing our capacity to undertake high quality clinical, public health and health services research. The Clinical Informatics and Data-Management Unit and our Biostatistics Unit is capable of handling large health related data sets with high levels of sophistication, which has significantly contributed to our research performance. The research program of the department includes both clinical and public health research which takes place in remote communities, workplaces, ambulances and hospital wards internationally and in Australia.

The department has a strong research funding budget of $25 million, which includes NHMRC and ARC grant funding exceeding $10 million. Thirty-five new research grants started last year and the department currently holds 114 research grants, which provides a strong research environment for 2011 and beyond. We were successful in securing seven NHMRC grants in the 2010 Project Grant Round and three NHMRC Career Development Fellowships. Furthermore, several staff members received awards and distinctions for their achievements. Professor Flavia Cicutini was awarded the Parr Prize for excellence in rheumatology research during the Annual Rheumatology Association meeting. Dr Deborah Zion and Associate Professor Bebe Loff were finalists in the 2010 Eureka Prize. Dr Elizabeth Barr received the Mollie Holman Medal for the best doctoral thesis of the faculty. Judy Gold was first in the faculty Three Minute Thesis competition. Professor Peter Cameron was elected Chair of the International Society of Emergency Physicians.

During 2010, our staff (including adjuncts) authored a record number of publications. Of these, five were published in The Lancet, four in the New England Journal of Medicine and one in the Journal of the American Medical Association.

Research Highlights
Opening of the Michael Kirby Centre for Public Health and Human Rights
The Kirby Centre, named after the eminent jurist and High Court judge, The Hon. Michael Kirby AC CMG, was officially opened in 2010. Mr Kirby is a renowned human rights activist and was recently appointed to the new Global Commission on HIV and the Law. The centre was opened officially by Michel Sidibé, a UN High Commissioner. The centre is headed by Associate Professor Bebe Loff and focuses on human rights and public health, as a collaborative venture between scientists, lawyers, medical practitioners and academics at the school.

Appointment of Chair in Global Health
Professor Ajay Mahal was appointed to the Alan and Elizabeth Finkel Chair in Global Health. Born in India, Ajay holds a Bachelor of Economics degree from University of Delhi and a Masters degree. He moved into the area of health economics during his PhD studies at Columbia University, New York. As a consultant and adviser, Ajay has worked with the Harvard Institute for International Development in Gaza and West Bank, and the Indian government. He is an expert on issues related to health financing, social determinants of health, and economics of HIV/AIDS. This position was made possible through the philanthropy of Dr Elizabeth Finkel and Dr Alan Finkel, Chancellor of Monash University.

Commencement of the ASPREE Trial
Facilitated by a grant from the Victorian Cancer Agency, the ASPREE Trial commenced in 2010. Regional centres were established at Geelong, Warrnambool, Shepparton, Bendigo, Ballarat and Traralgon. ASPREE Biobank, funded by CSIRO, was of substantial value to the trial. Anne Murray (United States collaborator) and Brenda Kirpach (study coordinator), visited and shared their expertise during the trial, which we greatly value and appreciate.

Clinical Registries
The development and promotion of clinical registries has become an important agenda of the department. Although these registries are primarily used for improving the safety and quality of healthcare, they have significant potential in other forms of health services research and clinical investigations. Accordingly, under the outstanding leadership of Dr Sue Evans, new registries were established for burns, prostate cancer and lung cancer. Associate Professor Chris Reid, Carl Costello and Angela Brennan, together with our Data Centre, have contributed significantly to improving the ability to manage and develop such registries.

The Kirby Centre was officially launched on 29 August 2010 by Michel Sidibé, Executive Director of the Joint United Nations Programme on HIV/AIDS (UNAIDS), centre. Michael Kirby is pictured front left.

Postgraduate Students
- 89 PhD Students
- 12 Other Doctoral Students
- 371 Masters Students

Publications
- 420 Journal Articles
- 2 Books
- 17 Book Chapters
The main focus of research in the Gastroenterology Department in 2010 continued to be in the areas of chronic viral hepatitis, hepatocellular carcinoma and inflammatory bowel disease.

**Chronic Viral Hepatitis**

A number of novel therapeutic strategies for the treatment of chronic hepatitis C were evaluated, including:

- A study with an all oral interferon-free treatment involving combination therapy with hepatitis C viral polymerase and protease inhibitor demonstrating profound viral suppression without the development of viral resistance (published in *The Lancet*).
- A second all oral interferon-therapy study in hepatitis C genotype 1 patients involving the combination of a non-nucleoside polymerase and protease inhibitor.
- A Phase 3 study of Telaprevir in combination with peg interferon alpha-2a plus ribavirin in both treatment naïve and treatment experienced patients (the latter accepted for publication in *New England Journal of Medicine*).
- Transfusion of hepatitis C virus (HCV) lipopeptide-primed autologous dendritic cells in prior non-responders to treatment demonstrating enhanced T cell responsiveness in HCV patients (published in *Journal of Hepatology*).
- A Phase 2 study of novel protease inhibitor TMC435 in combination with peg interferon plus ribavirin in genotype 1 patients.

Several key investigator-initiated studies were performed, including:

- Evaluation of the mechanisms behind reduced response rates in subjects with hepatitis C-related cirrhosis to standard therapy (two key papers published in *Hepatology* and *Journal of Hepatology*).
- Investigation of the role of toll like receptors in the development of hepatitis C-related liver inflammation and fibrosis in hepatitis C and HCV-HIV coinfected patients (published in *Journal of Viral Hepatitis*).
- Assessment of the mechanisms by which GBV virus C protects against the development of progressive severe liver disease in subjects with HCV and HIV coinfection (published in *Journal of Hepatology*).
- The clinical impact of having minimal residual viraemia at week 24 of therapy on treatment response in HCV genotype 1 patients (published in *Antiviral Therapy*).
- Information on the outcomes of tenovir therapy in patients with chronic hepatitis B who had a suboptimal response to adefovir therapy (published in *Gut***).

**Hepatocellular Carcinoma**

A range of novel therapeutic strategies were studied in patients with hepatocellular carcinoma across all disease stages including:

- Sorafenib as adjunctive therapy in early stage disease following liver resection or local ablation and in intermediate stage disease following transarterial chemoembolisation.
- Evaluation of brivanib; and combination therapy with sorafenib and erlotinib as an alternative to sorafenib in advanced disease.
- Evaluation of survival outcomes in patients with early stage disease treated with radiofrequency ablation.

**Fibroscan Evaluation of Fibrosis**

The unit has expanded its clinical and research program evaluating the utility of Fibroscan in several patient groups including:

- Haemophiliacs with hepatitis C and HIV coinfection (published in *Haemophilia*).
- Type 2 diabetics in which Fibroscan was shown to be an excellent screening tool for the detection of steatohepatitis and significant liver fibrosis.
- Chronic liver disease showing liver stiffness measurement has good predictive value for the presence of clinically significant portal hypertension.
- Heart failure demonstrating those with acute and chronic heart failure have a significantly higher liver stiffness that is not improved by diuretics.

**Inflammatory Bowel Disease**

Novel biological treatment strategies were evaluated during 2010 in patients with Crohn’s disease and ulcerative colitis. These included golimumab for ulcerative colitis and the adhesion molecule blocker MLN002 for both acute and maintenance therapy in patients with severe Crohn’s disease. A large collaborative study established with St Vincent’s Hospital continued to assess the effectiveness of immunomodulator therapy with or without TNF-α blockade to reduce recurrence of Crohn’s disease following surgical resection.

The development of a large inflammatory bowel disease database was also a key initiative to facilitate investigator-initiated research. Several key studies included examination of the role of azathioprine metabolites as well as methotrexate metabolites in improving patient management in patients with Crohn’s disease, as well as investigating the role of capsule endoscopy in patients with quiescent Crohn’s disease.

**Endoscopy**

Two important investigator initiated research projects were performed in 2010 in the area of endoscopy:

- A multicentre study of the outcome of endoscopic mucosal resection of giant polyps in the colon (accepted for publication in *Gastroenterology*).
- A comparative assessment of the efficacy and safety of percutaneous endoscopic gastrostomy tube placement compared to radiologically inserted gastrosotmy tubes.

**Postgraduate Students**

1 PhD Student

**Publications**

14 Journal Articles
The General Surgery Department remains committed to clinical research, basic science research, databases, clinical registries, clinical trials, and audit and quality assurance processes. Those entering into surgical training are well supported in research projects, and will be invited to present at the DS Rosengarten Prize in December each year and often at the Annual Scientific Congress of the Royal Australasian College of Surgeons.

**Breast, Endocrine and General Surgery**

Databases in thyroid surgery, parathyroid surgery, adrenal surgery, parotid surgery, soft tissue tumour surgery and a dedicated thyroid cancer database are established and contribute to active clinical research projects.

**Current Projects**

- Ongoing study of the rate of bifurcation of recurrent laryngeal nerves and the location of the motor fibres of the recurrent laryngeal nerve in the anterior branch (Prof. J Serpell)
- Changes in the diameter of the recurrent laryngeal nerve during thyroid surgery and the relationship of this to voice changes following surgery: a collaborative project between Speech Pathology, ENT and Endocrine Surgery (Prof. J Serpell)
- A model examining differences in tension in the right and left recurrent laryngeal nerves in collaboration with the Faculty of Engineering, Monash University (Prof. J Serpell)
- Surgery in the patient with Hashimoto’s thyroiditis (Dr M Seifman, Dr S Grodski, Prof. J Serpell)
- Adrenal tumours, adrenal incidentalomas and phaeochromocytomas (Dr D Woon, Dr S Grodski, Prof. J Serpell)
- The diagnosis and management of adrenal trauma and adrenal incidentalomas detected in trauma patients (Dr S Woodruff, Dr M Yeung, Dr S Grodski, Prof. J Serpell)
- Bone metastases arising from minimally invasive follicular thyroid cancer in patients without a demonstrable primary thyroid tumour (Dr J Ban, Dr A Andrabi, Prof. J Serpell)
- The role of core biopsy in the diagnosis of thyroid lymphoma (Dr K Buxey, Prof. J Serpell)
- Epidemiology of thyroid cancer in Melbourne and establishment of a thyroid cancer registry (Prof. J Serpell)

**Colorectal and General Surgery**

**Current Projects**

- Multidisciplinary meetings in colorectal cancer: treatment outcomes and conformation to NHMRC guidelines (Dr P Carne)
- Prospective assessment of component training in laparoscopic colorectal resections (Dr S Bell)
- A classification system for causes of faecal incontinence and their relative incidences (Dr S Skinner)
- Development of a standard protocol for management of colonic pseudo-obstruction (Dr M Chin)
- Efficacy of dual therapy for anal fissure (Dr C Farmer)
- Examination of standards required for accreditation of endoanal ultrasound (Dr C Farmer)
- Sphincter preserving surgery for anal fistulas and fissures (Dr S Skinner)
- Utilisation of synoptic reporting for MRI in rectal cancer (Dr P Carne)

**Upper GI and General Surgery**

The Upper Gastrointestinal Unit has databases in hepatectomy, pancreatic surgery, oesophagectomy, gastrectomy and bariatric surgery. Along with their own research programs, this unit has significant collaborations with investigators at Baker IDI and Monash University School of Public Health and Preventive Medicine.

**Current Projects**

- Traumatic bile duct injuries/leaks (Dr C Pilgrim, Dr V Usatoff, Dr M Smith, Dr P Evans)
- Follow-up of patients following cholecystostomy (Dr B Gong, Dr V Usatoff, Dr M Smith, Dr P Evans)
- Algorithm for management of LAGB patients in the Emergency Department (Dr L Freeman, A/Prof. W Brown, Dr A Korin, A/Prof P Nottle)
- Outcome of patients with liver trauma (Dr P Evans, Dr V Usatoff, Dr P Burton)
- Survival following hepatectomy (Dr V Usatoff, Dr M Smith, Dr P Evans)
- Follow-up of liver resections for metastatic colorectal cancer (Dr V Usatoff, Dr M Smith, Dr P Evans)
- Motility disorders and LAGB surgery (Dr P Burton, A/Prof. W Brown, A/Prof. P Nottle)
- Motility disorders pre and post fundoplication (Dr P Burton, A/Prof. W Brown, Dr A Smith, A/Prof. P Nottle)

**Speech pathologists Miriam Voortman (left) and Jessica Hayward use the lingWAVES voice analysis system as part of the post thyroidectomy voice study.**

**Postgraduate Students**

- 2 PhD Students
- 1 Masters Student

**Publications**

- 10 Journal Articles
Conferences and Forums

World Health Day 2010

On 7 April 2010, the 4th Annual AMREP Conference was held on the topic of Health and the City. Reflecting the WHO’s theme for 2010, ‘Urbanisation and Health’, the conference focused on both the implications of urbanisation for the health of disadvantaged populations and approaches to improving maternal health in low-income countries.

Peers for Progress Forum

The International Public Health Unit (IPHU) hosted a successful forum for Global Peers for Progress (a global diabetes prevention program) in August 2010. Discussion at the forum focused on how to improve the provision of peer support programs for people with diabetes and other chronic conditions in Australia and other countries. More than 50 participants representing over 30 NGOs and other organisations from around Australia attended the half-day forum.

Compass Knowledge Hub

Since 2008, Burnet’s Centre for International Health, along with the Menzies School of Health Research and the Centre for International Child Health, has been contracted by AusAID to implement the Women’s and Children’s Health Knowledge Hub (Compass). In April 2010, Burnet hosted a useful round-table discussion for Bob McMullan, (then Parliamentary Secretary for International Development Assistance), AusAID, and a panel of maternal and child health experts, on how to reduce maternal and newborn mortality particularly focused on the Asia and Pacific countries.

United Nations Department of Public Information/NGO Conference: Making Health Global

This 2010 conference was held in Melbourne with the major theme being global health and the Millennium Development Goals. This is the third time this conference has been held outside of New York in sixty-three years. Burnet’s Centre for International Health was actively involved in the meeting. Monash University was represented by IPHU and Monash medical students from the IGNITE Global Health Group.

Research, Teaching And Capacity Building

Amphetamine Use in South East Asia

The Burnet Centre for International Health, in conjunction with the National Drug Research Institute (Australia), commenced a research project for the Australian National Council on Drugs on amphetamine use in South East Asia.

Asian Collaboration for Excellence in Non-communicable Disease Research Network

The Fogarty International Center at the US National Institutes of Health awarded more than US$1 million to Professor Brian Oldenburg and others from around the Asia-Pacific region over five years to combat the growing epidemic of chronic diseases in low- and middle-income countries.

Australian Development Research Award

This two-year innovative research study on mapping sexual and social networks of men who have sex with both men and women in Laos and Vietnam, countries with concentrated HIV networks, is undertaken by the Burnet Institute with a $330,000 ADRA grant.

Addressing Healthy Ageing

The Burnet Centre for International Health was successful in an application for funding under Round 7 of the AusAID-funded Australian Leadership Awards. In July 2010, 14 Fellows from seven countries came to Australia to participate in the Strengthening Public Health Leadership to Address Healthy Ageing program.

Kerala Diabetes Prevention Program (K-DPP)

With colleagues from Baker IDI and other international collaborators, the International Public Health Unit at Monash University received NHMRC funding to conduct the K-DPP, a cluster randomised controlled trial of a culturally-tailored and group-based lifestyle intervention program in Kerala, India over the next five years.

Bushbuckridge Water Project

This project concluded in 2010, having investigated the relationship between water, HIV and diarrhoea in South Africa, with funding from the Monash University Office of the Deputy Vice-Chancellor (International). The project involved researchers from Monash University (Australia and South Africa), The Alfred, Burnet Institute and University of the Witwatersrand (South Africa).

Heart of Soweto Study

Baker IDI in collaboration with the University of the Witwatersrand and the Hatter Institute, University of Cape Town, continues to undertake the Heart of Soweto Study in South Africa. This continues to be one of the largest most comprehensive studies of heart disease in Africa.

Surveillance and Monitoring Function of the National NCD Program of Vietnam

Baker IDI collaborates with Monash University to conduct this study and relies on three main institutes that include the Vietnam Ministry of Health, Menzies Research Institute and the World Health Organization. The aim of the study is to establish a sustainable system for NCD surveillance in Vietnam.
Research Activities
The Department of Immunology is internationally renowned for its combined expertise in research, teaching and service delivery in immunology and immunopathology. There are extensive research programs in basic and translational immunology, including highly successful collaborations with The Alfred and other AMREP partners.

The department’s research activities target diseases including allergy, asthma, autoimmunity, inflammation, diabetes, organ fibrosis, cancer and malaria. The department also focuses on engineering novel treatments such as nanoparticle-based vaccines in cancer and infection, as well as therapeutic proteins and monoclonal antibodies. Researchers are funded by NHMRC, ARC, Cooperative Research Centre and other research grants and have a strong publication output, patent portfolio and biotech activity. In 2010, 13 NHMRC grants were awarded to Department of Immunology researchers.

The department has extended its research activities at the Clayton campus establishing an effective link between basic science and translation/clinical trials at The Alfred. The department also regularly organises scientific retreats to promote scientific integration and spearhead new collaborations within the department.

Current Projects
Allergy, Immunology and Respiratory Medicine
Professor Jennifer Rolland and Professor Robyn O’Hehir (AIRmed, The Alfred)
Clinical trials and in vitro studies are used to investigate mechanisms of allergen immunotherapy and optimal strategies for down regulation of the adverse T-cell response to allergens in allergic individuals.

Research highlights
• Peanut allergy peptide immunotherapy development: Identification of the dominant T cell epitopes of the major peanut allergen Ara h 2. Published in the Journal of Allergy and Clinical Immunology (Prickett et al. 2010). Continued funding from the Ilhan Food Allergy Foundation and successful NHMRC Project Grant 2011-2013 on ‘Human CD4+ T-cell epitope-based therapeutic for peanut allergy’.
• Grass pollen allergy peptide immunotherapy development: Incorporation of a panel of grass pollen allergen T cell epitope-based peptides identified by this group into an immunotherapy product entering phase II clinical trial by Circassia Ltd. Mapping of T cell epitopes of the major Bahia grass pollen allergen, Pas n 1, funded by the CRC for Asthma and Airways.
• Follistatin therapy for cystic fibrosis and other lung inflammatory disorders: Proof-of-concept studies funded by the CASS Foundation show potential for follistatin to inhibit airway inflammation in cystic fibrosis using a murine model.
• Nanoparticles inhibit allergic airway inflammation: Optimal particle size and chemistry determined for nanoparticles that induce lung resistance to airway inflammation. Continued funding by the CRC for Asthma and Airways and an NHMRC Project Grant 2011-2013.

Autoimmune Diseases
Associate Professor Frank Alderuccio
Research centres on processes associated with the autoimmune response and loss of immunological tolerance, with the aim of devising strategies to prevent or reverse autoimmunity. Experimental models of autoimmunity are used to explore the potential of gene therapy strategies aimed at treating these diseases.
• Use of haematopoietic stem cell manipulation to induce immunological tolerance
• Understanding and utilising expression of AIRE for tolerance induction in autoimmunity
• The use of corticosteroids in strategies aimed at promoting disease remission
• Role of regulatory T-cells in experimental models of autoimmunity
• Induction of tissue specific antigen expression using retroviral vectors

Diabetic Retinopathy
Professor Jennifer Wilkinson-Berka
The contribution of vasoactive and growth factor systems to the development of diabetic microvascular complications is studied. Goals are to develop new, safe and effective treatment regimens for patients with diabetic retinopathy, providing a major advance over current invasive therapies such as laser treatment.
• The role of the proenin receptor in ischemic and diabetic retinopathy
• Aldosterone and angiotensin II: are they conspirators in diabetic retinopathy?
• Pathogenic associations between the microvasculature, glia and neurons in ischemic and diabetic retinopathy
• Do interactions between glyoxalase I and angiotensin contribute to pericyte and endothelial cell death in diabetic retinopathy?

Autoimmune Diabetes
Associate Professor Robyn Slattery
The Autoimmune Diabetes Group is focused on understanding the immunopathogenesis of Type 1 diabetes (T1D). The primary interest of the team is in elucidating the role of β2M and MHC class I in directing the autoimmune response in diabetes. This is crucial for our understanding of how to regulate the disease in predisposed individuals. Using a sophisticated genetic engineering tool called ‘cre/lox’, we have been able to track the development of autoreactive CTL from the time they first become activated to attack the beta cells, until the beta cells are destroyed, insulin production is lost, and diabetes develops. Current projects are focused on:
• The role of β2M and MHC class I on pancreatic ductal cells in the development of autoreactive CTL
• The role of β2M and MHC class I on B lymphocytes during the expansion of autoreactive CTL

The Autoimmune Diabetes team identified an important mechanism by which B lymphocytes contribute to the pathogenesis of Type 1 diabetes. Our finding demonstrates a crucial role for the CD19 molecule on B lymphocytes in the expansion of pathogenic CD8 T cells.
Molecular Signalling
Head: Associate Professor Jun-Ping Liu
Studies of the mechanisms regulating the maintenance of telomeres (chromosome ends) in health and disease:
• Cancer inhibition by targeting telomerase using peptide inhibitors
• Cancer inhibition by GAPDH signalling to telomeres
• Cancer inhibition by cytokine signalling to telomeres
• Immune senescence and the roles of telomere maintenance
• Studies of trace metal homeostasis in health and disease
• The roles of ATP13A2 P-type ATPase transporter in lysosomal homeostasis and neurodegenerative diseases

Leucocyte Membrane Protein
Associate Professor Mark Wright
The Leucocyte Membrane Protein Laboratory is fascinated by the role of tetraspanin cell surface proteins in the immune system. Tetraspanins play a vital role in the molecular organisation of the cell surface. Our analyses of tetraspanin deficient mice show a key role for these molecules in all aspects of immunity including pathogen recognition, antibody production, inflammation and cellular immunity. Key tetraspanins studied include CD37, TSSC6, CD82 and CD53.

Research highlights
• CD37 is important for plasma cell survival: Collaborative studies have shown that CD37-deficient mice make poor IgG responses to model antigens. This poor humoral immunity is caused by a failure to establish an adequate population of long lived plasma cells. Found evidence that a functional regulation of a4b1 integrin underlies this phenotype.
• Functional co-operation between tetraspanins CD37 and TSSC6 in adaptive cellular immunity: Analyses of mice lacking both CD37 and TSSC6 shows that these tetraspanins functionally co-operate to regulate both T cell proliferation and antigen presentation. Published in the Journal of Immunology (Garltan et al. 2010).
• A key role for CD37 in cellular immunity and dendritic cell migration: CD37-deficient mice make poor T cell responses to tumour antigens. This poor cellular immunity is caused by deficient migration of CD37-deficient dendritic cells from the periphery to draining lymph nodes.
• CD37 is necessary for neutrophil inflammation: Collaborative studies have shown an important role for CD37 in mediating adhesion between neutrophils and inflamed vascular endothelium.

Leukocyte Signalling
Associate Professor Margaret Hibbs
The Leukocyte Signalling Laboratory studies signalling pathways that play a role in immune system development and function. This group is primarily interested in regulation of the development of immunity and understanding the processes that are perturbed when autoimmunity and inflammatory diseases develop.

The group is also interested in understanding the regulation of blood cell development, and believe that it will lead to a greater understanding of the signals that go awry in the development of blood cell cancers. Another major interest is understanding the mechanisms underlying chronic inflammatory lung disease and they aim to identify key pathways or targets for therapeutic intervention.

Vaccines and Infectious Diseases
Professor Magdalena Plebanski
This group is investigating the development of novel vaccines against cancer and infectious diseases as well as immunoregulation (immune evasion and immune suppression).
• Development of malaria and cancer vaccines using a novel nanovaccine technology
• Investigation into the effect of nanoparticles on dendritic cells and other immune cells
• Nanoparticle induction of lung resistance to allergy and inflammation
• Understanding immunosuppression in malaria and cancer by studying changes in dendritic cells and regulatory T-cells (Tregs)
• Study of altered peptide ligand-mediated regulation of T-cell activity and the use of peptide superagonists to enhance malaria vaccine efficacy
• Discovery and validation of new surface markers to distinguish Th1, Th2 and Treg subsets and their use to monitor diverse infectious diseases and cancer

B-cells, BAFF and Autoimmunity
Professor Fabienne Mackay
BAFF is a cytokine from the tumour necrosis factor family that is essential for B-cell development and survival. BAFF production drives autoimmunity and is linked to many autoimmune conditions in humans. The BAFF gene was cloned by Professor Mackay in 1999 and her laboratory was the first to publish a role for BAFF in systemic lupus erythematosus (SLE). In 2009, the BAFF inhibitor belimumab showed efficacy in SLE clinical trials and on 9 March 2011, belimumab was approved by the FDA as a new treatment for lupus, the first new treatment in over 50 years.
• Investigation of the cooperation between BAFF and the innate immune system
• Studies on the role of BAFF in immunoregulation and immune tolerance
• Studies on the role of BAFF in human diseases
• Investigating new forms of autoimmune processes independent of T-cells
• Development of a chemokine receptor inhibitor for the treatment of fibrosis
• Studies of novel microRNAs involved in regulation of BAFF and its receptors in cancer and autoimmunity
• Investigations into the complex interaction between the gut microbiota and immune cell function
• Studies on the role of BAFF in regulating telomeric function and its role in immunosenescence

Postgraduate Students
30 PhD Students
1 Masters Student

Publications
53 Journal Articles
Research Activities

The Alfred Infectious Diseases Unit (IDU) incorporates a large clinical service with active research programs in the fields of HIV, viral hepatitis, infections in the immunosuppressed (such as those with malignancy, in intensive care and post-splenectomy), influenza, drug resistant organisms, antibiotic use and infection prevention and hospital epidemiology.

HIV

Our research in HIV ranges from basic laboratory studies through to clinical research and public health. We have significantly expanded our basic and clinical research programs aimed at understanding where HIV ‘hides’ in patients on treatment and how HIV can be eliminated in these long-lived cells. This work has recently attracted the award of three NHMRC Project Grants and a fellowship from the American Foundation for AIDS Research (AmFAR) to Dr Suha Saleh and an investigator-initiated Merck sponsored clinical trial on the role of vorinostat in eliminating latent HIV infection (awarded to Dr Lewin, Dr Elliott and Dr Hoy). In recognition of some of this work, Professor Lewin gave the plenary lecture at the opening ceremony of the World AIDS Conference in Vienna in July 2010 on ‘Strategies for HIV Cure’. This conference attracts over 25,000 delegates and 2,000 journalists and is the most widely covered health related conference globally.

We also investigate the genetic factors that play a role in recovery of the immune system following treatment of patients with HIV infection. PhD student Reena Rajasuriar has initiated two new international collaborations in Uganda (in collaboration with UCSF) and in Malaysia (in collaboration with the University of Malaya) to further understand a particular genetic mutation that controls cell division.

The Clinical Research Unit is actively involved in multiple international studies to evaluate new treatment strategies and antiretroviral agents. Dr Julian Elliott, head of the Clinical Research Unit, is currently establishing a Melbourne-wide prospective cohort of patients with HIV infection in collaboration with the Burnet Institute, the Victorian Infectious Diseases Reference Laboratory, several high case load GPs and other tertiary hospitals. We hope to better understand complications of anti-HIV treatment in this cohort. Dr Elliott, together with Professor Lewin, was also awarded an NHMRC Partnership Grant for $1.5 million to perform a randomised clinical trial of a new model of care for patients with HIV infection. The Alfred hospital, Australasian Society for HIV Medicine (ASHM) and the National Association for People Living with HIV are all financial partners in the project providing an additional $1.5 million over five years.

Our expertise in understanding the clinical impact and pathogenesis of HIV-related complications such as dementia, cardiovascular disease and bone disease was recognised with Dr Edwina Wright giving the plenary lecture at the 2010 national ASHM meeting and her receipt of an NHMRC Postdoctoral Clinical Training Fellowship. Kate Cherry was an invited speaker at the 3rd International Congress on Neuropathic Pain (Athens) and the 13th World Congress on Pain (Montreal) on the topic of ‘HIV associated neuropathy’.

Viral Hepatitis

Research in viral hepatitis combines basic laboratory and clinical work. We are determining how HIV and hepatitis B virus (HBV) may potentially interact in the same liver cell and how the immune system responds to HBV when a person also has HIV. Dr Megan Crane was awarded the highly competitive Mathilde Krim Biomedical Fellowship from AmFAR. We are continuing to collaborate on a multicentre international study investigating the natural history of HIV-HBV infection and have an active program to identify and characterise drug resistance to anti-HBV medication in Australia and Thailand under the supervision of Dr Jennifer Audsley.

Fungal Infections

Fungal infections are a major cause of death in patients with leukaemia and after transplantation. We completed a randomised controlled trial examining the impact of new diagnostic tests for deep tissue infection with Aspergillus on the earlier diagnosis of infection and patient outcomes. We started a project measuring levels of azole antifungal agents in lung tissue of lung transplant recipients to determine activity specifically at the site where infection usually occurs.

The fungus Cryptococcus is rarely seen in Australia but is the second commonest cause of death in HIV-infected patients in Africa. Dr Christina Chang is undertaking her PhD under Professor Lewin, Dr Elliott and Professor Martyn French (Royal Perth Hospital). Christina is based at the King Edward Hospital, Durban, and has established one of the largest prospective cohorts of HIV-infected patients with cryptococcal meningitis who are initiating anti-HIV therapy. She was awarded a Pfizer Neurosciences Grant and a grant from ANZ Trustees (with Dr Orla Morrissey) to fully characterise the cryptococci isolated from these patients.

Dr Suha Saleh works in the HIV and Hepatitis Immunopathogenesis Laboratory.

Professor Jennifer Hoy, Director of HIV Medicine, chaired the ‘HAART at 15’ symposium at the 18th Conference on Retroviruses and Opportunistic Infections. Edwina Wright and Jennifer Hoy are co-chairs of two substudies of the START Study, examining the effects of early versus deferred antiretroviral treatment on neurological disease and bone disease in patients with HIV infection. Professor Hoy and Kerrie Watson are members of the Steering Committee of the Australian HIV Observational Cohort study, which collects data from over 2,000 HIV patients and provides information on the trends of treatment, survival and disease progression.
General Infectious Diseases
Dr Anton Peleg was recruited to The Alfred as part of a joint appointment between the Departments of Medicine and Microbiology, Monash University, following a very successful postdoctoral fellowship at Harvard Medical School. As a result, several new research programs have been initiated in general infectious diseases.

Influenza
The Alfred, in conjunction with Australian National University, has led a national hospital-based surveillance system to provide real-time reporting of influenza hospitalisations, clinical data on influenza and pneumonia, and estimates of influenza vaccine effectiveness. Associate Professor Allen Cheng was a chief investigator on a study to monitor for serious complications of influenza vaccination.

Drug Resistant Organisms
PhD student Ching Jou Lim initiated studies to look at rates of bacterial resistance and antibiotic use in long-term care facilities and in patients presenting from the community to The Alfred Emergency Department. Such studies will assist in characterising reservoirs of antibiotic resistance and help guide initial antibiotic prescribing. Dr Peleg has also initiated studies to assess the long-term trends in antibiotic resistance in high-risk units at the Alfred, including the Burns, Respiratory and Haematology Units. Dr Peleg was invited to give a keynote address at the International Acinetobacter Meeting in Rome and a plenary lecture at the International Conference on Antimicrobial Agents and Chemotherapy in Boston. He was also chosen for the Monash Research Accelerator Program.

Dr Cheng led the development of national treatment guidelines for Clostridium difficile infection and designed a national period prevalence survey for this infection with colleagues at the University of Western Australia and the University of Queensland. A case control study was performed to examine risk factors for colonisation with vancomycin resistant enterococci, and the use of antiseptic washcloths to prevent transmission with this organism was evaluated.

Improving Antibiotic Use
Guidance, an electronic decision support system to improve antibiotic usage within the hospital, was rolled out over 2010 with considerable input from IDU staff. Multiple research projects related to appropriate use and appropriate dosing of antibiotics in collaboration with the Pharmacy Department are under way. Dr Cheng was an organiser of the Antibiotic Resistance Summit held in Sydney in February 2011 and performs studies on the toxicity of aminoglycoside antibiotics and the pharmacokinetics of vancomycin.

Spleen Registry
The Spleen Registry was involved in a number of studies to define risk in certain patient groups who have had their spleen removed. We have developed and evaluated a new test to measure the immune system after the spleen is removed. We are also evaluating optimal vaccine use in these patients as part of an NHMRC-funded study.

With Dr Mark Polizzotto in the Haematology Unit, we measured the added risk of splenectomy on infection risk in the HIV population. We measured changes in IgM memory B cells in patients with asplenia and in those patients with medical conditions that may result in asplenia.

Major Findings
• Fully characterised a novel in vitro model of latent HIV infection which is now being used to screen compounds that may reverse or eliminate latency
• Showed that dendritic cells assist HIV in establishing latent infection
• Showed that genetic markers that predict immune recovery following anti-HIV treatment are significantly different in Caucasians and Africans
• Showed that in HIV-HBV co-infection, there are high levels of gut-derived bacteria in the general circulation and this may contribute to worse liver disease in these patients
• In collaboration with the INSIGHT Network, we showed that the only adverse effect of continuous antiretroviral therapy in HIV infection is greater loss of bone compared to those treated to keep their immune function above the level at which opportunistic infections and malignancies occur
• Showed that interruption of antiretroviral therapy causes changes in lipids and lipoprotein subclasses associated with cardiovascular disease
• Characterised the risk factors for candidaemia-related mortality in cancer patients
• Characterised the current cost of a deep tissue fungal infection in Australia using novel economic modelling

Research Achievements
Researchers in IDU were awarded various NHMRC grants: six Project Grants, a Partnership Grant, two Early Career (Postdoctoral) Fellowships and a Career Development Fellowship. Other major grants included an AmFAR Mathilde Krim Postdoctoral Fellowship (Crane/Lewin), AmFAR Postdoctoral Fellowship (Saleh/Lewin) and a National Institutes of Health RO1 grant (Hoy) on the effect of untreated HIV versus early antiretroviral therapy on bone mineral density.

Awards
• Fiona Wightman (PhD student with Professor Sharon Lewin) received a Young Investigators Award to attend the Conference of Retroviruses and Opportunistic Infections (CROI) in San Francisco
• Dr Michelle Anada Rajah (PhD student with Associate Professor Monica Slavin) received an antifungal award from the Australasian Society for Infectious Diseases (ASID)
• Dr Anton Peleg received the Frank Fenner Award for Excellence in Infectious Diseases from ASID
• Associate Professor Margaret Hellard received the Fenner Award from the Burnet Institute
• Dr Edwina Wright received the Victorian AIDS Council/ Gay Mens’ Health Clinic Research Excellence Award

Current Projects
A complete list of current projects is available from http://www.alfredresearch.org/research/researchrep10.htm

Postgraduate Students
13 PhD Students
1 Masters Student

Publications
59 Journal Articles
3 Books
28 Book Chapters
In 2010, the Intensive Care Department expanded its position as a national leader in critical care research and education, with many major journal publications and projects spanning most areas of our diverse speciality. Areas of research included prehospital resuscitation, cardiac support devices, ICU outcomes, nutrition, traumatic brain injury, acute lung injury, renal failure, chest trauma, venous thromboembolism, sepsis and hypothermia.

As a result of an initiative between The Alfred and Monash University, the Intensive Care Department now has four intensivists who are 50% academic: Professor Jamie Cooper, Associate Professor Andrew Davies, Associate Professor Alistair Nichol and Associate Professor David Pilcher. Most of the other intensivists in the group are active in research and all intensivists now hold academic qualifications.

The ICU research team manager is Shirley Vallance (who, as part of the Alfred-Monash initiative, is now funded by The Alfred) and the department has two other research coordinators, Victoria Bennett and Jasmine Board. The group works closely with the Australian and New Zealand Intensive Care Society Clinical Trials Group (ANZICS CTG).

Major Highlights
- A three year NHMRC-funded randomised controlled trial led by Associate Professor Steve Bernard in Victoria concluded. It found that pre-hospital rapid sequence intubation in severe head injury patients improved long term neurological function. Published in *Annals of Surgery*, it is likely to have substantial international impact, translating into immediate changes in clinical practice.
- A $2 million Program Grant was received from the Victorian Neurotrauma Initiative to support two randomised trials in traumatic brain injury (Cooper, Bennett, Nichol).

Current Clinical Research Trials
The Intensive Care Department has up to 20 clinical trials running every year at any one time. Usually only one or two of these are commercial trials. The others are investigator initiated and frequently supported by the NHMRC. Key studies in 2010 included:

**DECRA:** This unique NHMRC-funded randomised trial of a neurosurgical procedure to reduce brain pressure in severe head injury patients was completed in November 2010 after seven years. Led by The Alfred in collaboration with the Neurosurgery Department, it was published in *New England Journal of Medicine* in 2011.

**STATINS:** A NHMRC-funded Phase 2 randomised trial testing atorvastatin therapy for severe sepsis patients concluded in 2010.

**RIBFIX:** A Phase 2 randomised trial with Silvana Marasco and other cardiac surgeons, testing a novel absorbable rib fixation technique for patients with traumatic flail chest nearled completion.

**PROTECT:** A multicentre randomised trial led by the Canadian Critical Care Trials Group and McMaster University testing two methods for thromboprophylaxis in critically ill patients. This study of 3,500 patients will be one of the largest randomised trials ever done in ICU patients, with Australia, particularly The Alfred, being responsible for one quarter of the total recruitment. This study was published in *New England Journal of Medicine* in 2011.

**PHARLAP:** An Alfred-initiated randomised Phase 2 trial of an improved package of care for mechanical ventilation of patients with acute lung injury was completed in 2010.

**ICU Outcomes:** David Pilcher, with the ANZICS Centre for Outcome and Resource Evaluation and Michael Bailey from ANZIC-RC, has undertaken projects investigating the epidemiology and outcomes of patients admitted to ICUs in Australia and New Zealand.

Education
The Alfred ICU is a leading centre for education and in 2010 ran:
- Four basic courses (introduction to ICU) for junior medical staff
- Advanced life support course
- Two extracorporeal membrane oxygenation (ECMO) workshops
- 3rd International ECMO Symposium
- Inaugural Nutrition in the Critically Ill Symposium
- 2nd Trauma ICU Symposium
- 4th Advanced Mechanical Ventilation Conference

Awards
- Associate Professor David Tuxen – ANZICS Honour Roll for lifetime contribution to Intensive Care
- Associate Professor Alistair Nichol – Irish Congress of Anaesthesia: best oral presentation
- Dr Lisen Hockings – GA Don Harrison Medal
- Associate Professor Andrew Davies – AMREP Research Prize for the article describing original research published in the journal with the highest impact factor in 2009

Dr Steve Philpot teaches the procedure of bronchoscopy at the inaugural Alfred ICU ‘Bronchoscopy for the Critically Ill’ course.
In 2010, the Medical Oncology Unit contributed to clinical research projects involving Phase 1, 2 and 3 trials, with both national and international sponsors, as well as collaborative trial groups. The collaboration between the Medical Oncology Unit and Cancer Trials Australia continues, offering us the opportunity to participate in and offer more trials to our patients.

Dr Andrew Haydon is the Australian/New Zealand Study Chair of a large international trial called the SCOT Study. It is a Phase 3, randomised, multicentre study of adjuvant chemotherapy in colorectal cancer, comparing a shorter course of chemotherapy treatment against the standard duration. This study is conducted by the National Cancer Research Network in the UK, and run locally by the Australasian Gastrointestinal Trials Group (AGITG).

Dr Jeremy Shapiro is the AGITG Study Chair of an international study run by the National Cancer Institute of Canada. The study is titled: a Phase 3 randomised study of brivanib alaninate (BMS-582664) in combination with cetuximab (ERBITUX®) versus placebo in combination with cetuximab in patients with K-Ras wild type tumours previously treated with combination chemotherapy for metastatic colorectal carcinoma. Recruitment to this study is now closed and there were 16 Alfred hospital participants enrolled.

In 2010, the Medical Oncology Unit successfully completed a Phase 1 malignant melanoma study, offering a promising new treatment to Alfred patients.

The unit has collaborated with the Monash University Women’s Health Program to evaluate a large contemporary cohort of Victorian women with invasive breast cancer, focusing on important psycho-social and quality of life issues which are often poorly addressed in the medical literature. The work resulted in three international publications in 2010.

The unit collaborated with the Palliative Care Units from St Vincent’s Hospital and The Alfred together with The Alfred Clinical Ethics Group in exploring the dynamics and outcomes of second medical opinions in cancer care, and their impact on patients and their doctors. The results were published in an international journal in 2010, and a second paper will be published in 2011.

Current Projects

- **SCOT** (Short Course Oncology Therapy) Study – a study of adjuvant chemotherapy in colorectal cancer (Dr Andrew Haydon)
- **QUASAR 2** – multicentre international study of capecitabine +/- bevacizumab as adjuvant treatment of colorectal cancer (Dr Andrew Haydon)
- **PETACC-6** – preoperative chemoradiotherapy and postoperative chemotherapy with capecitabine and oxaliplatin versus capecitabine alone in locally advanced rectal cancer (Dr Sanjeev Gill)
- **LAP07 study** – a randomised multicentre Phase 3 study in patients with locally advanced adenocarcinoma of the pancreas: gemcitabine with or without chemoradiotherapy and with or without erlotinib AGITG (Dr Andrew Haydon)
- A randomised Phase 3 study of weekly abi-007 plus gemcitabine versus gemcitabine alone in patients with metastatic adenocarcinoma of the pancreas (Dr Sanjeev Gill)
- **BETH** – Multicentre Phase 3 randomised trial of adjuvant therapy for patients with her2-positive node-positive or high risk node-negative breast cancer comparing chemotherapy plus trastuzumab with chemotherapy plus trastuzumab plus bevacizumab (Professor Max Schwarz)
- A randomised Phase 3, double-blind, placebo-controlled, multicentre study (RAD001) to evaluate the efficacy and safety of everolimus in adult patients with advanced hepatocellular carcinoma after failure of sorafenib treatment (Dr Andrew Haydon)
- **NITRO** – A Phase 3, randomised trial of adding nitroglycerin to first line chemotherapy for advanced non-small cell lung cancer (Dr Andrew Haydon)
- An open label, multicentre, Phase 3 trial of ABI-007 versus dacarbazine in previously untreated patients with metastatic malignant melanoma (Dr Andrew Haydon)
- A Phase 1, randomised, open-label, multicentre, multiple dose study to investigate the pharmacokinetics and pharmacodynamics of RO5185426 administered as 240 mg tablets to previously treated BRAF V600E positive metastatic melanoma patients (Dr Andrew Haydon)
- **SORCE** – A Phase 3 randomised double-blind study comparing sorafenib with placebo in patients with resected primary renal cell carcinoma at high or intermediate risk of relapse (Dr Sanjeev Gill)
- A randomised, double-blinded, multicentre Phase 3 study comparing everolimus (RAD001) plus BSC versus placebo plus BSC in patients with advanced gastric cancer after progression on prior systemic chemotherapy (Dr Prasad Cooray)

Publications

6 Journal Articles
The Monash University Department of Medicine is responsible for the provision of teaching and other academic programs at The Alfred for medical undergraduates and postgraduate research students. The department is the focus of many research activities undertaken by university personnel employed in the department and also by hospital clinical departments associated with the Department of Medicine. Many physicians and scientists employed in the hospital’s clinical departments have honorary appointments within the Department of Medicine to facilitate the provision of the teaching program, research programs and supervision of postgraduate research students.

Respiratory Immunology Group

There is an active program of research by the clinician scientists of the Department of Allergy, Immunology and Respiratory Medicine, and scientists in the Monash University Departments of Medicine and Immunology. The program includes the investigation of the immunobiology of allergic diseases with development of novel T cell targeted peptide immunotherapy for peanut allergy and novel approaches to management of chronic lung diseases including allergic bronchopulmonary aspergillosis, cystic fibrosis, idiopathic pulmonary fibrosis and lung transplantation. A program of study of lung regeneration using stem cell technology was established in association with Monash Immunology and Stem Cell Laboratories together with investigation of strategies to prevent ischaemic reperfusion injury in lung transplantation. Research investigates the potential for follistatin to prevent airway inflammation and fibrosis in chronic inflammatory lung diseases.

Renal Disease

Clinical research projects are in the area of glomerulonephritis, vasculitis, progression of renal disease, diabetic renal disease, chronic allograft rejection, evaluation of renal disease in patients with end stage heart and lung pathology facing heart or lung replacement, and renal disease following successful heart and lung transplantation. The broad theme of the laboratory research program is the mechanisms of progression of primary renal disease. Both human and experimental models of renal disease are studied, with a particular focus on the role of the fibrogenic growth factors and apoptosis in progression of injury.

Neurosciences

The Van Cleef Roet Centre for Nervous Diseases conducts research programs in stroke, Alzheimer’s disease and other dementias, inherited and sporadic ataxias, movement disorders and cognition in cerebellar stroke and hepatitis C. Traumatic brain injury is the focus of research of another neuroscience group within the department, using experimental models of injury. This group works in close collaboration with the National Trauma Research Institute.

Clinical Pharmacology

Pharmacological research is focused on drugs that may affect the cardiovascular system. Basic research programs investigate the role of: urotensin II in cardiac disease; p38 MAP kinase system in heart failure disease progression; Rho kinase in cardiac fibrosis; novel agents in cardiac fibrosis and inflammation. Therapeutics research also encompasses novel device and procedure-based approaches to treatment of cardiovascular disease.

Infectious Diseases

Research programs are conducted in the fields of HIV, viral hepatitis, neurovirology, infections in the immunosuppressed (such as those with malignancy, in intensive care and post-splenectomy) and infection control and hospital epidemiology.

Women’s Health

Research pertains to the main health conditions that affect women at midlife and beyond. Major research projects include a large study of the physical, psychological and social well-being of breast cancer survivors, a community based study of urinary incontinence in women, a study to increase the understanding of joint pain in women being treated for breast cancer, and studies to delineate the role of sex steroids in the preservation of cognitive function in women after menopause.

Endocrinology and Diabetes

Laboratory research is conducted in the areas of diabetic complications and insulin-like growth factor dysregulation in cancer. Clinical research areas include diabetes care and thyroid cancer.

Experimental Anatomical Pathology

This laboratory has a strong focus on pathologic study of human tissue and, through collaborative studies, conducts research into the role of the endothelium in cardiac transplantation, new prognostic markers in breast and prostate cancer, imaging of dementia, pathologic diagnosis of early muscular dystrophy and pulmonary venoocclusive disease and pulmonary hypertension. A particular focus within the laboratory is latent viral infections of the brain.

Centre for Ethics in Medicine and Society

The specific objectives of the centre are: (1) to stimulate a culture of reflection, debate, dialogue and awareness of ethical issues in the medical community and the faculty; (2) to deliver high quality teaching products; (3) to conduct research; and (4) to contribute to the development and enrichment of practice.

PhD student, Tara Bull, supervised by Associate Professor Tom Kotsimbos and Dr Nicole Mifsud, studies Clara cell secretory protein as a biomarker post lung transplantation.

Postgraduate Students

62 PhD Student
2 MD Students
2 Masters Student

Publications

103 Journal Articles
1 Book
7 Book Chapters
Melanoma Service

Head: Associate Professor John Kelly MBBS, MD, FACD
victorianmelanomaservice.org

Research Activities

As a large treatment service for melanoma, primary research interests are in identifying at-risk patients, early detection and therapy. The key focus in recent years has been to explore the importance of aggressive, rapidly growing melanoma. Recent work has shown that these melanomas account for only 13% of melanomas but half of melanoma deaths. Their rapid growth means that there is a relatively brief opportunity to undertake early, curative treatment and yet they are most often misdiagnosed because of their unusual appearances.

An exciting opportunity to explore the genetic and molecular associations of rapidly growing melanoma has arisen through the Melbourne Melanoma Project (MMP), a Victorian Cancer Agency funded collaboration between the Victorian Melanoma Service (VMS), Peter Mac and the Austin. Through MMP, melanomas will be tissue banked for genetic and molecular studies. PhD student, Dr Victoria Mar, gained an NHMRC grant for this work in 2010.

Dr Chris Jalilian has been investigating the dermoscopic appearances of rapidly growing melanoma and other aggressive tumours that have similar appearances. The aim of his work is to use this new and widely available method of examination to aid the early diagnosis of these tumours and to distinguish them from benign imitators. He used this approach to describe for the first time the dermoscopic appearances of Merkel cell carcinoma, an aggressive skin cancer that mimics nodular melanoma. Chris was awarded a Small Project Grant from The Alfred for this work in 2010.

Dr Yan Pan has extended a study of the prognosis associated with the presentation of metastasis of melanoma to the skin and has been able to distinguish three groups of patients with widely differing prognoses in association with their skin metastases. He has also identified and described a newly recognised presentation of melanoma in a study of nine cases of regrowth following excision of a previously benign pigmented lesion.

The use of sequential dermoscopic images taken at short (three month) or long (six month) intervals is a new and exciting method for the early detection of melanoma. Dr Hussain Hilmy has reviewed three years of experience from VMS staff members in the use of sequential dermoscopic imaging to provide a better understanding of the role of this technique. His review shows that it is very useful for detecting melanomas in the highest risk groups.

There are a number of techniques for surveillance of patients who are at risk for the development of melanoma to enhance early detection. The most effective application of these techniques depends on the accurate identification of people who are most at risk. Previous research has provided data on the influence of a number of important risk factors; however, it is very hard for doctors to accurately compute the mathematical impact of multiple risk factors simultaneously to assess the risk for an individual patient.

Dr Victoria Mar has developed a risk model using currently available risk data. In 2010, this was made available as an online instrument that doctors and patients can use to predict risk to develop melanoma in the next 5 years. It is presented on the VMS website. This has enabled more appropriate allocation of individuals to surveillance strategies for the early detection of future melanomas. Presentations to dermatologists and general practitioners in 2010 have led to heavy traffic on the website, demonstrating strong uptake of the model.

Dr Chris Jalilian uses the dermoscope to distinguish melanomas from other aggressive skin cancers.

Dr Victoria Mar developed the melanoma risk calculator, which was launched on the Victorian Melanoma Service website in 2010.
Chlamydia trachomatis
Untreated chlamydial infection among pregnant women has been associated with adverse outcomes for both mother and infant. Like most women, pregnant women infected with chlamydia do not report genital symptoms, and are therefore unlikely to be aware of their infection. A cross-sectional study of 100 pregnant women aged 16-25 years attending antenatal services across Melbourne were invited to participate in a face-to-face, semi-structured interview on the acceptability of screening for chlamydia during pregnancy. It was found that 31 of these women were infected with chlamydia. Women had low levels of awareness of chlamydia before the test, retained relatively little knowledge after the test and commonly had misconceptions around chlamydia transmission, testing and sequelae. Chlamydia screening as part of routine antenatal care was considered highly acceptable among young pregnant women who recognised the benefits of screening, and strongly supported its implementation as part of routine antenatal care. The acceptability of screening is important to the uptake of chlamydia screening in future antenatal screening strategies (JE Bilardi, MJ Temple-Smith, SM Garland, CK Fairley, JS Hocking, MY Chen).

HIV Research
Mathematical modelling suggests that increased frequency of HIV testing among men who have sex with men (MSM) will lead to a reduction in HIV incidence. We are therefore in the early stages of a randomised trial examining the HIV testing frequency in MSM offered rapid tests compared to MSM offered normal lab-based tests (SMARTtest study). Follow-up is at 18 months. This particular rapid test requires a finger prick blood sample and provides a result in 20 minutes (T Read, MY Chen, A Morrow, CK Fairley).

MSHC has patients in ongoing multicentre HIV studies including SPARTAC (a study of early versus deferred antiretroviral treatment of seroconverters), ALTAIR (a randomised comparison of three initial treatment combinations) and CORAL (a comparison of bovine colostrum, raltegravir or both, to boost CD4 counts in patients with poor immune recovery despite good suppression of viral replication).

Bacterial Vaginosis (BV)
BVAPS (bacterial vaginosis antibiotic and probiotic study) is an NHMRC-funded blinded placebo-controlled randomised controlled trial evaluating combination therapy with oral metronidazole/vaginal clindamycin against oral metronidazole/vaginal placebo and oral metronidazole/vaginal probiotic for the treatment of BV (C Bradshaw, M Pirotta, C Fairley, S Garland).

A meta-analysis of the behavioural risk factors associated with BV was published in Clinical Infectious Diseases. It showed that BV was associated with new and multiple sexual partners, lack of condom use and findings that illustrate that BV has the epidemiology of an STI (K Fethers, C Bradshaw, C Fairley).

The Female University Student Study (FUSS) examined the association between sexual practices and BV. It provided support for the hypothesis that BV is an STI by showing that BV is absent in women without a history of sexual activity and is strongly associated with increased numbers of sexual partners. We are conducting a two-year study to determine the behavioural and microbial risk factors associated with incident BV in women with female partners (K Fethers, C Bradshaw, C Fairley).

Human Papilloma Virus (HPV)
The focus of the Hyper Study is the prevalence, incidence and natural history of oral and anogenital HPV among young MSM, which should shed new light on this area and help to inform policy on HPV vaccination of MSM. A study of HPV oral infection in MSM found a prevalence of approximately 15% of all types of HPV. A cohort of 100 HIV-infected MSM having regular screening for anal cancer is being monitored (T Read, H Zou, M Chen, C Fairley).

Use of CASI in Low-risk Populations
The proportion of clinically important diagnoses in a low-risk, asymptomatic population who use a computer-assisted self interview (CASI) to assess risk was examined to determine optimal health service delivery. Medical records were retrospectively analysed for risk characteristics and diagnoses in 1,060 new asymptomatic heterosexual patients who completed CASI. From this low-risk group, 26 diagnoses were made on the day of presentation, including 22 cases of genital warts, three of herpes and one of unintended pregnancy. Additionally, there were 54 cases of chlamydia detected. As chlamydia is effectively diagnosed and managed from self-collected samples, patient review is not always required. This study provides evidence for an express testing service for chlamydia to streamline the screening of low-risk, asymptomatic patients as identified by CASI without the need for a traditional face-to-face consultation (A Yeung, M Bush, R Cummings, C Bradshaw, M Chen, H Williams, I Denham, CK Fairley).
The National Trauma Research Institute (NTRI) leads the way in research to better understand traumatic injuries and bridge the gap between research, clinical practice and policy for the benefit of injured patients. It continues to work in close association with The Alfred Trauma Service and gain recognition as a national and international hub and resource of trauma-related knowledge.

After restructuring in 2009, NTRI welcomed Business Manager, Craig Sedgman, and Research Manager, Dr Meng Tuck Mok, in 2010. The new team has helped shape the NTRI’s structure and activities, which include pillars of activity in stakeholder dialogue, research leadership, knowledge translation and performance improvement.

NTRI again convened its annual scientific conference in 2010, attended by over 300 national and international delegates. The conference was a joint meeting with the Australasian Trauma Society.

**Research Highlights**

The Global Evidence Mapping (GEM) initiative has been mapping existing neurotrauma-related research. These maps of existing research for traumatic brain injured (TBI) and spinal cord injured patients are available online and are being maintained. The next phase of GEM seeks to develop a system of evidence delivery that pushes evidence out to users through RSS feeds and Twitter, as compared to passive evidence accessed from a website.

The Health Knowledge Exchange Project is to develop a community of practice around performing and maintaining up-to-date high quality systematic reviews in neurotrauma topics. The software will be piloted with local and international communities of practice. The web-based delivery system will support the next phase of the GEM initiative.

The Neurotrauma Evidence Translation (NET) Program is a five-year research program that commenced in 2009, funded by the Victorian Neurotrauma Initiative, and conducted at the NTRI and the Australasian Cochranre Centre, Monash University. This program aims to address one of the biggest challenges in contemporary health care – the effective and timely translation of evidence from research into clinical practice and policy. The NET Program will develop and test strategies to increase the uptake of research into policy and practice.

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to improve outcomes for people after TBI by knowledge generation and synthesis; defining the problems and understanding practice and policy; designing and evaluating strategies for practice change in mild TBI; and building capacity for knowledge translation in neurotrauma by designing an intervention that will be rolled out in a cluster randomised controlled trial.

In the NTRI laboratory, headed by Associate Professor Cristina Morganti-Kossmann, investigations continue to test whether erythropoietin (EPO) provides neuroprotection for post-traumatic hypoxia, a condition known to exacerbate the severity of brain injury leading to worse neurological outcomes for patients with TBI. Using a well-established rat model of diffuse TBI, results favourably show the neuroprotective function of EPO provided after TBI hypoxia by reducing axonal pathology in the most vulnerable regions of the brain.

The DECRA study is led by The Alfred from the NTRI. It is a unique, partially NHMRC-funded, international, multicentre randomised trial to evaluate the effect of early decompressive craniectomy on neurological function in patients with severe TBI. DECRA aims to assess if decompressive craniectomy improves outcome for patients with severe diffuse TBI and brain swelling. The study completed recruitment in 2010.

**First APTQIN Meeting**

NTRI convened the first meeting of the Asia-Pacific Trauma Quality Improvement Network (APTQIN) in November 2010. The meeting was funded by AusAid and the Canadian Institutes of Health Research. APTQIN brought together influential leaders of trauma services from across the Asia-Pacific region to promote better understanding of the field of trauma quality improvement (QI). Members agreed to support development of trauma care and quality improvement activities at local and national levels across the Asia-Pacific region, build capacity through dissemination of information, tools and technology to support better trauma systems and seek endorsement from the WHO, professional colleges and relevant peak professional bodies.

**WHO Trauma Care Checklist Study**

This worldwide QI evaluation is being carried out at 12 hospitals globally, in low to middle income countries. Australia is one of only three high-income countries taking part. NTRI oversees this trial at The Alfred to qualitatively evaluate the impact of the program on safety culture, acceptability and implementation of the checklist. This will help determine the usefulness and effectiveness of a checklist in a busy Level 1 trauma centre like The Alfred.

**AusTQIP**

NTRI and the National Critical Care and Trauma Response Centre in Darwin are jointly developing and implementing the Australian Trauma Quality Improvement Program (AusTQIP) underpinned by national trauma data. AusTQIP represents a unique opportunity to collaborate on a national basis to share expertise, combine trauma data and work together to improve the quality of trauma care, improve trauma system performance and improve survival and quality of life for injured patients.
Psychiatric Disorders Following TBI
Professor Jennie Ponsford at the Monash-Epworth Rehabilitation Research Centre is conducting a prospective study of pre- and post-injury psychiatric disorders. The study is conducted early after injury and up to five years post-injury to look at the nature, frequency and risk factors of post-injury psychiatric disorders, as well as the relationship between psychiatric disorders and functional outcome. Early results indicate depression is strongly associated with poor functional outcome and is shedding some light on the factors that may help predict who is most at risk and when these disorders are likely to emerge. This will enable clinicians to plan early intervention thereby potentially reducing the emotional burden borne by injury survivors.

P.A.R.T.Y. Intervention Program
Prevent Alcohol and Risk-related Trauma in Youth (P.A.R.T.Y.) is a full day, in-hospital injury awareness and prevention program introducing school children to the real consequences of risk taking behaviour. In 2010, the P.A.R.T.Y. intervention pilot program was introduced at The Alfred, targeting young adult offenders aged 18-25 who have been court ordered to attend, with the aim of reducing re-offending rates.

Current Projects
• Post traumatic hypoxia in the exacerbation of cerebral inflammation elicited by brain injury (Morganti-Kossman MC, Kossmann T)
• Establishment of a neurotrauma tissue/fluid bank within the National Neural Tissue Resource Centre (McLean C, Morganti-Kossman MC, Kossmann T, Rosenfeld JV)
• Traumatic injury to the brain and spinal cord: secondary injury, development and evaluation of new treatments (Saunders N, Morganti-Kossman MC, Tan S-S, Callaway J, Crack P, Howells D, McIntyre P)
• Post traumatic hypoxia increases trophotrophic metabolite production and exacerbates secondary brain damage (Yan E)
• To determine the role of tissue type plasminogen activator on models of traumatic brain injury (Medcalf R, Morganti-Kossman MC, Schmidt H, Rosenfeld JV)
• Role and mechanisms of NADPH oxidase in ischemic stroke and neurotrauma (Schmidt H, Morganti-Kossman MC, et al.)
• Correlation of clinical and radiographic findings in acute cervical discoligamentous injury with long term outcomes in road trauma patients (Ackland H, Cameron P, Cooper DJ)
• EPO-TBI: randomised, placebo-controlled trial of erythropoietin in ICU patients with traumatic brain injury (Bellomo R, Cooper DJ, Street A, Nichol A, French C, Presnell J)
• A Phase 2 randomised controlled trial of atorvastatin therapy in intensive care patients with severe sepsis (Kruger P, Venkatesh B, Bellomo R, Kostner K, Cooper DJ, Roberts M)
• Parenteral versus enteral nutrition trial (Doig G, Cooper DJ, Simpson F, Davies A)
• Correlation of clinical and radiographic findings in acute cervical discoligamentous injury with long term outcomes in road trauma patients (Ackland H, Cameron P, Cooper DJ)
• Decompressive craniectomy in acute traumatic brain injury (Cooper DJ, Dobb G, Bannan P)
• DECRA study (Cooper DJ, Rosenfeld J, Kossmann T, Reilly P, Wolfe R, Murray L)
• RENAL: a multicentre unblinded randomised controlled trial to assess the effect of augmented versus normal continuous renal replacement therapy on 90-day all-cause mortality of intensive care unit patients with severe acute renal failure (Scheinkestel C, Pilcher D, Davies A)
• ENTERIC: a multicentre randomised controlled trial comparing early jejunal feeding (using a frictional nasojugal tube) and standard feeding in critical illness (Cooper DJ, Pellegrino V, Davies A)
• Phase 2 pilot randomised trial of operative fixation of fractured ribs in patients with flail chest (Marasco S, Cooper DJ)

• NICE TBI: normoglycaemia in intensive care TBI study (Finfer S, Myburgh J, Cooper DJ, Higgins A)
• Fluid resuscitation for patients with TBI – potential mechanisms behind the detrimental effect of albumin resuscitation (Cooper DJ, Myburgh JA)
• Evaluating the incidence and clinical importance of heparin induced thrombocytopoenia in the critically ill (Warkenet TE, Cook DJ, Cooper DJ, et al.)
• Trauma in older adults: does age matter? (Kinsella G, Olver J, Kossmann T, Ong B)
• The operation and utilisation of the Victorian State Trauma Registry (Cameron P, Gabbe B, McNeil J)
• VOTOR: Victorian Orthopaedic Trauma Outcomes Registry (Gabbe B, Cameron P)
• ARISE: Australasian resuscitation in sepsis evaluation randomised controlled trial (Bellomo R, Cooper DJ, Cameron P, et al.)
• POLAR: prophylactic hypothermia trial to lessen TBI randomised controlled trial (Cooper DJ, Bernard S, Rosenfeld JV, Cameron P, et al.)
• Transfusion research improving outcomes (McNeil J, Cameron P, Phillips L)
• Improving outcomes measurement and monitoring in trauma (Gabbe B)
• VSTORM: Victorian State Trauma Outcomes Registry (Cameron P)
• Bi-national Burns Registry (Cameron P, Gabbe B, Cleland H, Edgar D)
• Hyperbaric oxygen in lower limb trauma: a randomised controlled clinical trial (Miliar I, Cameron P)
• Massive Transfusion Registry (Cameron P)
• Defining and benchmarking clinically appropriate exceptions to the Emergency Department Four Hour National Access Target (Brand C)
• Australia’s blood supply in a major disaster or pandemic: how will we meet clinical demand (Phillips L)
• Telephone-administered early psychological intervention for depression and anxiety following serious injury (O’Donnell ML, Creamer M, Bryant R, Ellen S, Holmes A, Kossmann T, Judson R)
• Longitudinal head injury outcome study (Ponsford J, Olver J)
• Headstrong: multi-family groups for TBI (Couchman G, Ponsford J)
• Motivational interviewing with cognitive-behaviour therapy for anxiety and depression following TBI (Ponsford J, O’Donnell M, Lee N)
• Safer roads to recovery: assessing readiness for driving after TBI (Charlton K, Bedard M, Ponsford J, Marshall S, Stolwyk R, Ross P, Gagnon S)
• Longitudinal head injury outcomes study (Ponsford J, Olver J)
• The Global Evidence Mapping (GEM) initiative in TBI and spinal cord injury (Gruen R)
• NET Program: improving evidence-based care and the outcomes of patients with TBI and spinal cord injury through a program to facilitate knowledge transfer and exchange (Gruen R, Green S)
• Health Knowledge Exchange Project (Gruen R, Elliot J, Cavedon L, Zobel J, Harrison T)
• Australian Satellite of Cochrane Effective Practice and Organisation of Care Group (Gruen R)
• Evidence based action plans in the surgical areas of ENT, Trauma/Injury, Transplantation and Ophthalmology in the Australian Indigenous population (Gruen R)
• Neurotrauma Knowledge Translation international collaboration (Gruen R)
• TAC/WorkSafe Evidence Service (Gruen R)
Neurosciences
Head: Professor Elsdon Storey MBBS, DPhil, FRACP

Stroke
The Stroke Unit, under the leadership of Dr Judith Frayne, participates in many national and international multicentre stroke trials, including both industry-sponsored and investigator-driven trials. In 2010, these included studies nearing completion and a new investigator driven study looking at early mobilisation after stroke.

Alzheimer’s Disease and Other Dementias
Alzheimer’s disease has been called ‘the approaching epidemic’. Optimally, treatment for Alzheimer’s should be started as early in the disease as possible, when the only problem is of mild memory loss. In conjunction with Associate Professor Glynda Kinsella (La Trobe University), supported by an NHMRC grant, patients continue to be studied to ascertain whether teaching memory strategies at an early stage may improve everyday memory function. Judy Allen-Graham’s postdoctoral studies continue on the functions of APP, the nerve cell protein that is broken down to form the toxic amyloid protein of Alzheimer’s disease.

Professor Storey is on the international steering committee and the cognitive endpoint committee of the NIH-funded $50 million, 19,000 participant ASPREE trial of aspirin in the healthy elderly, for which dementia is a primary endpoint. He is also a CI on an Australian National University-led NHMRC-funded substudy, ENVISION, assessing the effects of aspirin on brain MRI, cognition and retinal vasculature, running over five years.

Inherited and Sporadic Ataxias and Other Neurogenetic Disorders
Spinocerebellar ataxias (SCAs) affect those parts of the brain concerned with coordination. Many cases have a genetic cause. Our clinical work in the inherited ataxias involves finding and describing new varieties of ataxic illness. In late 2009, we published our third previously undescribed inherited ataxia, SCA 30, and in 2010, we completed our studies (in conjunction with colleagues in Sydney and Wellington) into a newly recognised sporadic ataxia, CANVAS. The lead author is Dr David Szmulewicz, who was one of our advanced trainees in 2009.

In conjunction with Professor David Amor at the Murdoch Institute, we are pursuing genetic localisation of oculopharyngeodistal myopathy in a large pedigree studied by us and Dr Michael Fahey (Monash Medical Centre), as well as two apparently previously undescribed distal myopathies – one dominant and one recessive.

Gluten sensitivity (which underlies coeliac disease) has been proposed as a common cause of sporadic (non-genetic) ataxias by producing antibodies that damage the cerebellum, although this is contentious. Dr Louise Kelly and Volga Tarlac obtained antibodies to gluten (gliadin) in HLA-transgenic mice (a gift from University of Melbourne), and in 2010, showed that these high titre antibodies do not affect cerebellar function or structure. This work is to be presented at the American Academy of Neurology meeting in 2011.

The group continued to collaborate with Monash University (Gippsland) to produce portable apparatus with which to conduct various novel tests of upper limb coordination. Lyn Lindsay has started as a part-time PhD student on this project in 2010.

Movement Disorders
The research team, coordinated by Associate Professor David Williams, now includes Perdita Cheshire, a PhD student who is working on brain tissue archived at the Australian Brain Bank Network to investigate the possible causes of medication-related abnormal excessive movements in advanced Parkinson’s disease. Associate Professor Williams also co-supervises a University of Melbourne PhD student who is performing longitudinal neuropsychological studies on patients with movement disorders.

Together with the scientists in The Alfred Movement Analysis Laboratory, the team tests diagnostic and electrophysiological measures of tremor: dystonic tremor, orthostatic tremor and essential tremor.

Associate Professor Williams was invited to talk at international meetings including the Asian Oceania Section Movement Disorders Society Bi-Annual Meeting, Parkinson’s Disease and Movement Disorders Annual Congress and Neuroscience Japan Annual Meeting.

Cognition in Cerebellar Stroke and Hepatitis C
Chris O’Halloran, a La Trobe Neuropsychology student whose Masters is co-supervised by Professor Storey, has completed his studies on localisation of cognition and affective function in the cerebellum, and has submitted. Neuropsychologist Dr Rubina Alpitis studies the effects of hepatitis C infection on cognition, in conjunction with the Gastroenterology Unit, funded by an Alfred Research Trusts Small Project Grant.

Postgraduate Students
2 PhD Students
1 Other Doctoral Student

Publications
13 Journal Articles
In 2010, the Department of Neurosurgery entered an exciting new phase in its research program, with the commencement of the Monash Vision Direct to Brain Bionic Eye project. Professor Rosenfeld is a principal investigator with a team of experts in engineering physiology, ophthalmology and medical imaging, who, in partnership with industry, aim to restore some useful vision to selected blind individuals. The project is developing a cortical implant, in contrast to a retinal implant.

The Monash Vision Direct to Brain Bionic Eye system combines digital and biomedical technology with consumer-friendly glasses. A digital camera embedded in the glasses will capture images. As the head turns, the glasses turn as well. An eye movement sensor inside the glasses will detect more subtle changes in where the user looks. The digital processor will modify the images captured by the camera to present the image that is being looking at to the brain. Cutting edge digital processors will be embedded in the glasses along with a wireless transmitter. The transmitter will send signals to a chip inserted on the brain at the back of the head under the skull. The chip will then directly stimulate the visual cortex of the brain with electrical signals, which the brain will learn to interpret as sight.

The Neurosurgery Unit continued its participation in multidisciplinary and pure neurosurgical research in the last year. The study of blunt cervical and vertebral artery injury was published. This study has assisted neurosurgery, neurology and emergency physicians to more adequately screen trauma patients for these potentially devastating injuries. The POLAR study of hypothermia for severe traumatic brain injury is under way and we continue to work closely with the intensive care unit on this important project. The trial of decompressive craniectomy for diffuse traumatic brain injury has drawn to a close after seven years. The results were published in the *New England Journal of Medicine* in April 2011.

Phil Lewis continues his research on transcranial doppler and cerebral autoregulation. Dr Tony Goldschlager completed his PhD and published a number of papers in high ranking journals as a result of his research on mesenchymal stem cell applications in the spine.

**Awards, Prizes and Major Grants**
- The Monash Bionic Eye Project commenced in 2010. There are 30 researchers involved in this four-year project funded by an $8 million grant from the Australian Research Council
- Professor Rosenfeld was appointed to the Neurotrauma Committee of the World Federation of Neurosurgical Societies
- Professor Rosenfeld was the recipient of the John Thomson Medal and Oration, Royal Australian Army Medical Corps and Queensland Medical School, Herston, Brisbane

**Current Projects**
- DECRA: a multicentre randomised trial of early decompressive craniectomy in patients with severe traumatic brain injury (Cooper DJ, Rosenfeld JV, et al.)
- POLAR: Prophylactic hypothermia trial to Lessen Traumatic Brain injury randomised controlled trial (Cooper DJ, Rosenfeld JV)
- The correlation of clinical and radiographic findings with long-term outcomes in road trauma patients with acute cervical discoligamentous injury (Ackland H, Rosenfeld JV and Malham G)
- Establishment of a neurotrauma tissue/fluid bank within the National Neural Tissue Resource Centre (McLean C, Rosenfeld JV)
- Identification of risk factors for the development of postoperative bleeding after cranial neurosurgery (Hwang P)
- Intentional forgetting in frontal lobe tumour patients (Anderson J, Rosenfeld JV)
- The determination of the expression of calcitonin receptor (CTR) and the characterisation of CTR-positive cell types in human brain tumours. (Wookey P, Hwang P and Rosenfeld JV)
- Cerebral autoregulation monitoring in paediatric traumatic brain injury (Lewis P, Butt W, Rosenfeld JV)
- The development of a neurosurgical audit system (Lewis P)
- Melatonin in critical ill patients: a study to examine the levels of melatonin in severe head injuries (Morganti-Kossman C, Rosenfeld JV, Sellman M)
- Establishment of a spinal injuries registry (Tee JW, Chan P, Rosenfeld JV, Liew S, Gruen R)
- Identification of risk factors for the development of postoperative bleeding after cranial neurosurgery (Hwang P)
- Establishment of a spinal injuries registry (Tee JW, Chan P, Rosenfeld JV, Liew S, Gruen R)

**Postgraduate Students**
- 2 PhD Students

**Publications**
- 15 Journal Articles
- 4 Book Chapters
The Department of Nuclear Medicine was established in 1968 and is primarily committed to providing patient services that involve the use of unsealed sources of medical isotopes either for therapy or diagnosis. It is especially active in training medical specialists in the field and nuclear medicine technologists who are an integral part of the provision of these services to patients.

The department is involved in research activities that support its principal areas of clinical involvement and, with the presence of a dedicated positron emission tomography (PET)/computed tomography (CT) scanner, is increasingly focused on improving the assessment and management of cancer patients treated at William Buckland Radiotherapy Centre and other Alfred Health centres. The department has had a strong research track record under the leadership of Associate Professor Michael Kelly who retired as director after nearly 30 years of service to The Alfred. The department’s long history of actively participating in a series of multidisciplinary research projects with many other Alfred departments and the Baker IDI Heart and Diabetes Institute continues.

Several recently completed studies are now either published in peer reviewed journals or are in various stages of the publication process. These include a publication by Dr Thomas Barber, Nuclear Medicine Fellow, demonstrating PET/CT impacts on the treatment strategy in approximately 45% of patients with pancreatic cancer. Dr Kenneth Yap has worked closely with colleagues from the Centre of Obesity Research and Education, Monash University, and has contributed as a co-author on two publications evaluating the effects of laparoscopic gastric banding on gastric emptying, supra- and infra-band transit and sensation of satiety using novel nuclear medicine techniques.

### Current Projects

- A pilot study of non invasive assessment of acute graft versus host disease of the gastrointestinal tract and treatment response following allogeneic haemopoietic stem cell transplantation using 18F-FDG PET (Dr Martin Cherk with Departments of Haematology and Gastroenterology)
- A pilot study to assess activation of cervical and upper thoracic brown adipose tissue in humans via beta adrenergic stimulation using 18F-FDG PET (Dr Martin Cherk with Baker IDI)
- Predicting chemotherapy induced hepatic injury on clinical, genetic and imaging parameters following treatment of colorectal carcinoma (Dr Martin Cherk with Gastrointestinal Surgery Unit)
- Frequency of undetectable serum thyroglobulin and thyroglobulin Ab in spite of whole body I-131 positive scans in thyroid cancer patients (Dr Martin Cherk and Professor Duncan Topliss, Endocrinology Unit)
- A pilot study of the use of magnetic seizure therapy for treatment resistant depression (Dr Kenneth Yap and Professor Paul Fitzgerald, Department of Psychiatry)
- Precision of LVEF measurements obtained during gated SPECT Sestamibi myocardial perfusion imaging (Dr Martin Cherk and Associate Professor Victor Kalff)
- Comparison of prone versus supine left ventricular ejection fraction from gated myocardial perfusion studies and gated cardiac blood pool scans (Dr Kenneth Yap and Associate Professor Victor Kalff)
Phase 1 clinical trials, where a new drug therapy is tested in a healthy volunteer or in patients with specific medical conditions, are integral in the development of new therapies. Nucleus Network relies on community involvement in this process, and is grateful for the time and effort volunteered by participants, without whom new medicines would not reach the people who need them most. The information collected from clinical trials monitors and protects the participants' health and also provides crucial information about the therapy under trial.

Nucleus Network is a not-for-profit clinical research and education company wholly owned by Baker IDI Heart and Diabetes Institute. The organisation is one of Australia’s leading early phase clinical research facilities. The not-for-profit status provides the establishment of unique collaborations with hospital-based principal investigators, medical schools and access to dedicated research facilities and capabilities across AMREP.

The Centre for Clinical Studies AMREP, together with the Centre for Clinical Studies at the Austin Hospital, Heidelberg, are purpose-built facilities for the conduct of clinical trials and are core to the business of Nucleus Network. In addition to conducting early phase clinical trials, Nucleus Network provides education and training in Good Clinical Practice and clinical trial consulting services.

Nucleus Network Education is committed to developing high standards for education and training for clinical research and for building clinical research support frameworks. In 2010, Nucleus Network Education collaborated with the Victorian Managed Insurance Authority (VMIA), insurer of all public hospitals in Victoria, to develop a training program to implement the VMIA Research Governance Toolkit. The toolkit will help clinical research organisations ensure that their research is underpinned by best practice research governance and help them fulfill some of the requirements under the Australian Code for the Responsible Conduct of Research. In 2011, educational seminars will be delivered across Victorian public hospitals free-of-charge to participating clinical research professionals. These seminars will be presented by leading experts in the clinical research industry in partnership with local research office representatives.

2010 Highlights

- Over $2 million of services, donations, education subsidies, contract work and scholarships paid to AMREP members
- Over $13.5 million of direct export revenue generated for the Australian biopharmaceutical industry plus unquantifiable flow-on benefits for the industry and other economic sectors
- Three direct student placements, plus support provided to external researchers (including PhDs)
- More than 35 clinical trials conducted
- Clients include international big pharma companies from Australia, USA, Japan, China, New Zealand and the United Kingdom

**Recruitment staff member speaking to a potential volunteer.**

**Healthy volunteers use the entertainment facilities.**
The Alfred/Deakin Nursing Research Centre
The research activities of the Alfred/Deakin Nursing Research Centre have focused on the evaluation of quality and safety of nursing care delivery and the development and implementation of interventions to improve patient outcomes. The active doctoral research program has continued under the direction of the centre staff. PhD projects in progress are investigating symptom management in the oncology context, patient participation and preferences for participation in recovery after cardiac surgery, the quality of care of frail elderly in acute care to reduce functional decline and the trajectory of pulmonary dysfunction following cardiac surgery. Rochelle Wynne successfully completed her PhD titled ‘Antecedents to postoperative pulmonary dysfunction in adults having cardiac surgery’ in 2010.

Current Projects
- Evaluating quality of care in an oncology setting: symptom management and practices (Emma Cohen)
- Evaluating the quality of 24 hour acute care delivery: describing functional outcomes of older people using a model of best practice (Lenore Beddoes)
- Defining patient participation in treatment in acute care context (Lauren McTier)
- Predictors of hospital admission of patients with chronic obstructive pulmonary disease in the emergency department (Dr Julie Considine)
- Video analysis of interprofessional communication and decision making to manage sedation therapy in intensive care (Associate Professor Judy Currey)
- Living with an artificial heart: experiences of patients and carers (Associate Professor Judy Currey)
- Managing patients with a ventricular assist device: an exploration of international models for community-based care (Associate Professor Judy Currey)
- Enhancing medication safety in hospitals: development of a core dataset and an exploration of factors influencing nurses’ decisions (Associate Professor Judy Currey)

Vicki White was awarded the Kathleen AB Smith Memorial Prize in Nursing for her publication on mechanical ventilation weaning.

The effect of improving quality of heart failure programs on patient outcomes (Elizabeth Oldland)
- Mapping the trajectory of post-operative recovery for octogenarians following transcatheter aortic valve implantation (Roxanne Johnston)
- Increasing critical care nurses’ diagnostic accuracy of atrial electrograms by using an innovative education program (Julie Preston)
- Correlation between ETCO2 and PaCO2 in spontaneously breathing emergency department patients (Elaine Killeen)
- Presentation to emergency departments due to chemotherapy-induced complications: opportunities for improving service delivery (Associate Professor Trish Livingston)

La Trobe/Alfred Clinical School
A collaborative research project was undertaken between La Trobe/Alfred Clinical School of Nursing and the Department of Endocrinology and Diabetes led by Geraldine Lee and Sue Wyatt. The aim was to evaluate whether improvements would be seen in patients with diabetes who were undergoing cardiac surgery if they participated in a pre-operative education and intervention program compared to patients in the usual care group.

The intervention group was assessed by a diabetes nurse consultant, dietitian, and endocrinologist during a pre-operative visit. Specific diabetes questionnaires were administered, education delivered, and protocol-driven changes to the medical regimen instituted, including insulin commencement if appropriate. Length of stay, incidence of post-operative complications, and the number of post-operative inpatient review endocrinology visits required were assessed.

A total of twenty-four patients with a pre-operative HbA1c greater than 6.5% were studied (17 males and 7 females). The majority of participants were having bypass surgery and in the intervention group, HbA1c fell significantly by 1.9% (to 8.2%) compared to 7.0% in the usual care group. Improvements in patients’ self-care and efficacy were seen in the intervention group. In terms of complications related to cardiac surgery, there was a trend for usual care patients to require more post-operative endocrinologist visits and to have more acute diabetes-related complications. Although only a pilot study, it suggests a potential benefit of acute optimisation of diabetes treatment before elective cardiac surgery. Following these results, a larger study evaluating this intervention in elective surgery and medical patients at The Alfred will be undertaken.

The Masters of Nurse Practitioner course was re-accredited until 2015. This is the first Victorian Masters program to be reaccredited and the internship model, developed by Geraldine Lee, has become an integral part of all Masters programs throughout Australia.

Postgraduate Students
- 6 PhD Students
- 16 Masters Students

Publications
- 7 Journal Articles
2010 was a productive year for the Nutrition Department, expanding its research focus to include intensive care clinical nutrition along with the established nutritional research areas of human immunodeficiency virus (HIV) and cardiovascular health.

Julia Price continued her research in HIV and the risk of lowered bone mineral density as a result of a high risk of vitamin D deficiency. In conjunction with Dr Ian Woolley from the Infectious Diseases Unit, she investigates the prevalence of metabolic syndrome, lipodystrophy and cardiovascular disease risk in an ambulant ageing HIV-infected male cohort. This study of 517 HIV patients found that a significant proportion of patients were vitamin D deficient (75%). Predictors included gender, country of birth, HIV duration, season, anti-retroviral agent exposure and alkaline phosphatase.

Emma Ridley continued her role as the Australasian Society of Parenteral and Enteral Nutrition (AuSPEN) and the Australian and New Zealand Intensive Care Research Centre (ANZIC-RC) Nutrition Research Fellow (School of Public Health and Preventive Medicine, Monash University).

**Award**

Ibolya Nyulasi was appointed a European Society for Clinical Nutrition and Metabolism (ESPEN) Faculty member, in recognition of her significant contribution within ESPEN for developing and improving the field of clinical nutrition and metabolism.

**New Research Position**

Dr Audrey Tierney was appointed as one of the inaugural ICU research fellows for 6-12 months to investigate the use of metabolic cart measurements of resting metabolic rate versus current practice in estimating energy requirements of ICU patients.

**Current Projects**

- Are individuals with HIV and darker skin pigmentation at risk of lowered bone mineral density, and further HIV disease progression due to high risk of vitamin D deficiency? (Julia Price)
- Prevalence of metabolic syndrome, lipodystrophy and cardiovascular disease risk in an ambulant ageing HIV-infected male cohort (Julia Price, Emma Ridley)
- Can a modified fat diet with low glycaemic load improve insulin sensitivity and inflammatory mediators in overweight people with cardiac failure? (Suzannah Jackson, Rachel Stoney)
- A randomised controlled study of a pre-operative intervention in patients with diabetes undergoing cardiac surgery (Rachel Stoney and Sue Wyatt, Department of Endocrinology and Diabetes)
- POLAR BEAR: the Prophylactic hypOthermia trial to Lessen trAumatic bRain injury Basal Energy Assessment Research (Emma Ridley, Ibolya Nyulasi)

**Research Achievements**


Emma Ridley – recipient of the $20,000 Alfred Trusts Allied Health Grant in 2010 for POLAR BEAR – the Prophylactic hypOthermia trial to Lessen trAumatic bRain injury Basal Energy Assessment Research.

Kathryn Collins – poster presentation at the European Society for Parenteral and Enteral Nutrition meeting entitled ‘Complication rates of percutaneous endoscopic gastrostomy (PEG) versus radiologically inserted gastrostomy (RIG) insertion at an Australian tertiary referral hospital’.

Ibolya Nyulasi – invited speaker at the combined Gastroenterological Society of Australia and AuSPEN 2010 conference on the topics of malnutrition and quality services in PEG care.

**Postgraduate Students**

1 PhD Student
3 Masters Students

**Publications**

6 Journal Articles
The Occupational Therapy Service aims to enhance people’s quality of life by enabling them to participate in their chosen life roles and personal occupations, including self care, leisure, study and/or work.

Research output for 2010 has included two publications in peer-reviewed journals, as well as 12 free papers and 8 posters at national and international conferences. Key projects undertaken or completed in 2010 have reflected the breadth of speciality areas that occupational therapists work across. These have included:

- Evaluation of targeted occupational therapy services for elderly trauma patients
- Patient adherence to treatment in acute hand injuries
- Assessment of high level cognition based communication disorders in traumatic brain injury
- Conservative management of wrist pain caused by ulnar abutment
- School-based intervention to develop young children’s social competency
- Adult accomplishment in cystic fibrosis

In March, Annabelle Bond, along with colleagues from Speech Pathology, presented at the International Brain Injury Association’s Eighth World Congress on Brain Injury in Washington, USA. In May, three Occupational Therapy staff from The Alfred (Rebekah Clutterbuck, Michelle Farquhar and Lisa O’Brien) and two from Alfred Psychiatry (Lorrae Mynard and Gabby Pitt) presented their work at the World Federation of Occupational Therapists (WFOT) Congress in Santiago, Chile. Lisa O’Brien also presented two papers at the International Federation of Societies for Hand Therapy (IFSH) Congress in Florida, USA in June.

Lisa O’Brien submitted her PhD thesis (by publication). Her studies have included a multicentre randomised controlled trial comparing the effectiveness of different splints for mallet finger injury, a systematic review, a qualitative study of patients’ experience of distraction splinting for intra-articular finger fractures, and a two-centre cohort study comparing long-term outcomes with patients from Southern Health who received treatment other than distraction for the same injury.

Alison Hardman completed a Master of Public Health, travelling to Bangladesh to collect data for her thesis ‘Factors affecting utilisation of rehabilitation services by people with an upper limb injury in Bangladesh’.

The ‘Adult accomplishment in individuals with cystic fibrosis’ study, a joint project between Occupational Therapy and the Department of Allergy, Immunology and Respiratory Medicine, has continued.

Current Projects

Group-based fatigue management education for improving chemotherapy and radiotherapy patients’ performance and satisfaction with daily living activities (Anna Loughnan and Lisa O’Brien, supported by Southern Melbourne Integrated Cancer Service Supportive Care Research Grant, 2010-2011)

Alfred Child and Adolescent Mental Health Service schoolyard participation project: implementation and evaluation of a targeted school-based intervention program to develop young children’s social competency (Allison Cox)

Conservative management of wrist pain caused by ulnocarpal abutment (Alison Hardman and Lisa O’Brien)

Efficacy and patient experience of distraction splinting for complex intra-articular finger fractures (Lisa O’Brien and Dr Andy Simm, The Alfred; Dr Ian Loh and Kim Griffiths, Southern Health)

Women’s experiences of acute admission to an acute psychiatric ward (Jennifer Grigg and Tracy Fortune, La Trobe University; Scott Presnell)

Adult accomplishment in cystic fibrosis (Dr Rob Stirling, Fiona Hore-Lacy, Jenny-Maree Marshall and Scott Presnell)

Effectiveness of brief smoking cessation intervention with hospital patients: pilot study (Judy Shepherd, Sandringham Hospital)

Viability of occupational therapy involvement for pre-elective sternotomy patients (Carly McKeough)
In 2009, the Department of Orthopaedic Surgery started recruiting subjects into four international multicentre randomised controlled orthopaedic studies. During 2010, the department began to emerge as an international player in clinical orthopaedic research in collaboration with the number one group at McMaster University in Canada.

Key achievements in 2010 included:

- Associate Professor Liew was invited onto the Executive Committee of the International Hip Fracture Research Collaborative and the steering committees of two international randomised controlled trials. She featured in the Australian Orthopaedic Association Annual Scientific meeting with five invited presentations, eight scientific papers and five poster presentations.
- Dr Adam Dowrick, Research Fellow, was awarded an NHMRC Overseas Early Career Fellowship enabling him to work with the McMaster group for the next two years.

**International Multicentre Trials**

**FLOW (Fluid Lavage of Open Wounds):** this trial examines the effect of irrigation pressure and an additive to saline irrigant in the initial management of open fracture wounds on the reoperation rate within one year. The total number of patients required is 2,300 and as of January 2011, there have been over 652 patients recruited across 25 sites, with The Alfred being the lead recruiter and just having passed a milestone of recruiting its 100th patient. Associate Professor Liew is on the writing committee and the group has two publications in press. The first paper reports on the results of the pilot study and suggests a trend toward better outcomes with low pressure and soap irrigation. The second paper describes the methodology of the definitive trial now running. We were awarded a Monash Near Miss Grant to continue this study.

**FAITH (Fixation using Alternative Implants for the Treatment of Hip fractures):** this trial compares the reoperation rate within two years for the fixation of undisplaced neck of femur fractures using three screws versus a sliding hip screw. The total number of patients required is 1,500. As of February 2011, there have been 535 patients recruited across 60 sites, with The Alfred being one of best recruiters (19 patients) outside of the Netherlands.

**HEALTH (Hip fracture Evaluation using the ALternatives of Total hip arthroplasty versus Hemiarthroplasty):** this trial compares the reoperation rate within two years for the treatment of displaced neck of femur fractures using a total hip arthroplasty (replacement) versus a hemiarthroplasty (partial hip replacement). The total number of patients required is 2,000. It is still in the pilot phase, with The Alfred (one of 30 hospitals) having already attained its 15 patient target.

**PRAISE (PRevalence of Abuse and Intimate partner Abuse Surgical Evaluation):** this trial examines the prevalence of domestic violence in female patients who attend an orthopaedic outpatient clinic. This observational study requires a total of 2,700 female patients. The initial pilot study of 282 females found 89 (32%) had been subject to emotional, physical, or sexual abuse by their partners. A methodology paper has been published.

**VOTOR (Victorian Orthopaedic Trauma Outcomes Registry):** this registry of major orthopaedic trauma patients was established at The Alfred in 2003 and now collects data from four Victorian hospitals, and so captures information on the majority of these patients across the state. It provides collaborative research opportunities for consultants and junior staff and resulted in a number of presentations at national trauma and orthopaedic conferences in 2010.

**Departmental Studies**

Since the amalgamation of trauma and elective orthopaedics into one department in 2008, a working database of all patients treated has resulted in quarterly audits that provide a stimulus for questioning current clinical practices.
Clinical Biochemistry Unit
Head: Associate Professor Hans Schneider
- The cardiac marker testing with B-type natriuretic peptide (BNP) study showed that the use of BNP in the setting of emergency departments is of marginal value in that it may reduce hospital length of stay in healthcare environments with long hospital stay. At The Alfred, it does not seem to help patient management.
- In collaboration with the General Medical Unit, a study commenced to measure high sensitivity troponin T levels in patients without acute coronary syndrome that are admitted for other reasons. Troponin T levels appear to be more frequently elevated in patients with general medical problems, which may be important for long term prognosis and also may further identify high risk populations.
- The feasibility study of using urinary NGAL (neutrophil gelatinase-associated lipocalin) as an acute kidney injury marker in the ICU ended, with the outcome that patients who would develop acute renal failure with early NGAL elevation could not be easily identified.
- A study to identify urine and serum markers of acute kidney injury in heart failure in order to predict risk of future hospitalisation and cardiac events continued.

Haematology
Acting Head: Dr Susan Whitehead
During 2010, the focus of the Haematology Unit turned to the transfusion service, in particular, patient identification. An audit performed by the transfusion nurses showed poor compliance with the hospital procedure for patient identification when administering red blood cells (RBC). A proof of concept study using electronic hand-held devices was initiated to explore the hypothesis of improved compliance and, hence, patient safety.

Blood Bank
- Support of a pilot feasibility trial of allocation of freshest available RBCs versus standard care in critically ill patients undertaken by the ANZIC group is now complete, and demonstrated a significant degree of separation between the two groups
- In conjunction with the Transfusion Outcomes Research Collaborative, a study of the early coagulopathy in trauma is currently accruing patients

General Haematology
- The flow cytometry department continues to be involved mainly in Phase 1 drug studies from Nucleus Network
- In collaboration with the Clinical Haematology Unit, a Phase 2 study of lenalidamide and prednisolone as post-autologous stem cell transplant maintenance therapy for patients with multiple myeloma incorporating residual disease monitoring using flow cytometry is progressing
- Support of a cross-institutional study of the utility of repeating blood films in the diagnosis of imported malaria. Data suggest that, in selected patients, the diagnosis can be made using a single set of thick and thin blood films together with rapid ICT
- Collaboration continues with the Australian Centre for Blood Diseases in assessing the role of platelet glycoprotein 6 in haematological diseases
- An audit of intrinsic coagulation factor assays on patients who present to the Emergency Department with an unexpected prolonged aPTT showed that current practice is appropriate
- The study showing that rapid change in mean red cell volume can be used to identify wrong blood in tube samples in the laboratory was completed and the findings presented at the annual meeting of the Haematology Society of Australia and New Zealand

Microbiology
Head: Associate Professor Denis Spelman
Microbiology has an ongoing significant role in a hospital-wide diagnostic and consultative service, and a surveillance role in the monitoring and detection of antimicrobial resistance. Projects include:
- In collaboration with the Cardiothoracic Surgical Unit, studies of the causative organisms and impact of infections in patients with ventricular assist devices have been undertaken
- In collaboration with Infectious Diseases and Immunology, an NHMRC-funded multisite study to optimise immunisation protocols in hyposplenic and asplenic patients commenced
- Studies of patients with endocarditis and participation in the International Collaboration on Endocarditis
- Annual surveys of consecutive isolates with antibiotic resistance patterns and contributions to the Australian Group on Antimicrobial Resistance including hospital and community acquired organisms such as Staphylococcus aureus and Enterococcus faecalis
- Australian and New Zealand collaboration on the outcome of staphylococcal sepsis (ANZCOSS)
- Study of antibiotics resistance in the Asia-Pacific region (SENTRY): this is a study on antibiotic resistance to evaluate the frequency and antimicrobial susceptibility of bacterial isolates collected from specific clinical infections in different geographical regions
- Determination of risk factors for vancomycin resistant enterococci (VRE) and vancomycin susceptible enterococci
- Study of the usefulness of multilocus sequence typing in the determination of the epidemiology of VRE
- In collaboration with the Victorian College of Pharmacy and the Austin Hospital, a multisite analysis of cost of VRE infection
- Collection, identification and typing of methicillin-resistant S. aureus isolates over a 6 month period

Publications
12 Journal Articles
3 Book Articles
1 Book
The Department of Patient and Family Services Social Work Service continued to develop academic links with the University of Melbourne and has completed a consultancy program during 2010 with Associate Professor Lou Harms, University of Melbourne.

**Trauma Team**
The Trauma Team, in conjunction with Dr Lou Harms, completed the research project, ‘Family adaptation following trauma: the impact of ICU hospital admissions’, which explored family members’ perceptions of psychosocial trauma and adaptation as a result of an ICU admission. Findings indicated a high level of trauma symptoms relative to the mean scores in other studies of trauma. Similarly, the use of the PTGI showed that participants were also reporting some positive changes, occurring mostly in relation to personal resources.

**Chronic Illness Team**
Sue De Bono, Senior Social Worker, Bone Marrow Transplantation, in collaboration with Lynda Katona (Psychology) and Stuart Lee (Monash Alfred Psychiatry Research Centre), published a study on routine screening for psychological distress on an Australian inpatient haematology and oncology ward and the impact on use of psychosocial services in the *Medical Journal of Australia*. Up to 60% of cancer patients experience long-term distress, with 20-35% experiencing anxiety or depression. Many distressed inpatients are not identified or referred for psychosocial support until in crisis. The aim of this project was to trial a new system of screening inpatients to better identify distressed patients, to examine the causes of their distress, and to improve psychosocial referral. The research found that there is a high prevalence of unidentified distress in patients on the oncology ward, who would not normally be referred for psychosocial support.

A collaborative study was conducted on the psychological impact of haematopoietic stem cell transplantation on relative donors. For this research, we interviewed 19 sibling donors of recipients who underwent peripheral blood stem cell or bone marrow transplants from 2007 onwards. The findings revealed that there was a positive impact on the relationship between the donor and their sibling. However, donors experience a high level of distress associated with the success of the donation, which is linked with the length of the recovery for the recipient and whether the recipient survived the transplant.

Maureen McInerney, Senior Social Worker, Malignant Haematology and Medical Oncology, conducted a research project entitled ‘Telling children about their parent’s cancer: improving family focused practice in oncology and haematology in an acute adult hospital’. This project used current literature to assess whether it would help inform social work practice with children when a parent has been diagnosed with cancer. The communication style that a family adopts influences how they wish information to be given to their children, and this needs to be taken into account when working with families.

**Infectious Diseases Team**
The Infectious diseases Social Work Team, in collaboration with the HIV Mental Health Service, developed and commenced running a six week support group program for young people aged between 18 and 25 who are living with HIV. The group was set up to provide these young people with a safe and confidential space where they could discuss and share their experiences of living with HIV, working towards a goal of improving participants’ sense of social connection with other young people living with HIV.

Evaluation of the program will include consumer feedback and satisfaction outcomes, a presentation of critical reflections by the group facilitators and an assessment as to whether participants felt that had achieved an improved sense of social connection with other young people living with HIV.

**General Medicine Team**
The General Medicine team, in conjunction with Dr Lou Harms, investigates admissions to the General Medical Unit following a suicide attempt. This research will look at ways in which we can improve psychosocial support during a hospital admission.

**Pastoral Care**
Reverend Marilyn Hope continued with the project ‘The spiritual dimension of the experience of illness’, performing interviews of patients and a few staff members from pastoral care.

**Staff Achievements**

*From left: Stephanie Inglis, Associate Professor Lou Harms and Kellie Muir discuss research within the Social Work Trauma Team.*
The Centre for Medication Use and Safety (CMUS) has established itself as one of the key research units within the Faculty of Pharmacy and Pharmaceutical Sciences of Monash University. CMUS has two nodes: the one based within the Pharmacy Department of The Alfred focuses on acute health and medication use. The research activities of The Alfred node of CMUS fall under the broad banner of evaluating the quality use of medicines, and may be classified under the themes of medication safety, therapeutics, practice research and outcomes research.

**Key Research Projects**

- The ARC-funded COMPLIANS (COst-effectiveness analyses of improved adherence to Management PLans among AustralIANS) project is a collaboration between Pharmacy, Monash University Department of Epidemiology and Preventive Medicine, The Alfred Respiratory Unit and Roche Pharmaceuticals. The final data analysis is being completed and will enable us to investigate the economic impact of improved adherence to treatment plans in chronic disease.

- A research collaboration with Aged Care Services, Caulfield Hospital, investigated the success of a pilot SAM (self-administration of medications) program in hospitalised subacute aged care patients. Supported by a Collier Charitable Fund research grant, the program assessed patients’ ability to self-administer their medications when they are discharged home. Forty-three patients of average age 82.1 years were recruited over six months. Twenty-four patients passed the program; others were offered supports to ensure safe medication administration. The SAM program was found to be feasible in the subacute setting and staff resource requirements were quantified. The program was effective in detecting and addressing of barriers to medication adherence in elderly patients.

- A project funded through a Society of Hospital Pharmacists of Australia research grant has enabled one of our staff pharmacists, Ruth Chieng, to provide new services to the multidisciplinary allogeneic stem cell transplant (SCT) outpatient clinic. The aim of the project is to determine if the addition of a pharmacist to the clinic will improve the ability of patients to manage their medications and reduce the incidence of medication related problems after SCT. This project is nearing completion. Preliminary study results show that the pharmacist provides a beneficial service to the SCT clinic.

- A collaboration between The Alfred, Monash Centre for Medications Use and Safety and the National Prescribing Service completed an evaluation of the alert systems contained within the electronic prescribing modules of the Victorian Department of Human Services (DHS) HealthSmart system. This evaluation, funded by DHS, assessed a range of allergy, drug interaction and therapeutic duplication alerts. The study identified a broad representation of drug combinations encountered in hospital practice and evaluated the alerts generated from the Cerner/Multum system. A number of limitations were identified, with key recommendations developed for consideration and action by DHS.

- Pharmacy, together with the Department of Endocrinology and Diabetes, and Diabetes Education, have conducted a series of reviews to assess the monitoring and management of patients at risk of developing steroid-induced diabetes while receiving glucocorticoid agents (prednisolone, dexamethasone hydrocortisone, methylprednisolone). A monitoring and management guideline was developed and approved by the Alfred Health Drug and Therapeutics Committee as part of this work. A significant proportion of patients remain unmonitored or under-monitored; however, there has been an increase in appropriate referral to the Department of Endocrinology and Diabetes, and Diabetes Education as a result of this work.

**Other Current Projects**

A list of other current projects is available from [http://www.alfredresearch.org/research/researchrep10.htm](http://www.alfredresearch.org/research/researchrep10.htm)

**Pharmacist-led Anticoagulant Dosing Service in Hospital-in-the-Home Program**

The aim of this study was to evaluate the safety and effectiveness of a pharmacist-led anticoagulant dosing service in a Hospital-in-the-Home (HITH) setting. The study was prompted by a number of warfarin-related incidents in HITH. Data prior to pharmacists’ involvement were collected retrospectively.

An anticoagulant dosing competency program was established using local and international resources, together with nursing and medical input. During the initial stages of the service, pharmacists worked in pairs and contacted a treating doctor to confirm dose recommendations. Of the fifty-four patients who were dosed to two consecutive therapeutic INRs in the pre-intervention arm, it took on average 9.9 days to achieve the first therapeutic INR and 12.1 days to achieve two consecutive therapeutic INRs. In the post-intervention arm, the mean time to first therapeutic INR was 7.7 days and to have two consecutive therapeutic INRs was 8.8 days.

These data suggest that a pharmacist-led warfarin dosing service is safe and effective. Subsequent phases of the program will progress to trained competent pharmacists providing the dosing service independently.
The Alfred Physiotherapy Department’s research focus is on physical activity and rehabilitation in hospitalised patients and people with chronic illness. Active research programs investigate physiotherapy interventions for respiratory disorders, early mobilisation following surgery, physical activity in chronic disease, and physiotherapy in intensive care.

Carol Hodgson completed her PhD in 2010, investigating the effects of recruitment manoeuvres for ventilated patients with acute lung injury and acute respiratory distress syndrome. Her PhD studies, conducted with the Intensive Care research team, included a randomised controlled trial examining the effectiveness of a novel protective ventilation strategy in these critically ill patients. This study, funded by the Intensive Care Foundation, Australian and New Zealand College of Anaesthetists, Alfred Research Trusts and NHMRC, showed promising effects on oxygenation and lung inflammatory markers over a seven day period compared with the control group.

A randomised controlled trial of early mobilisation following ankle surgery, led by physiotherapist Lara Kimmel, was completed in 2010. This study showed that early ambulation on the first postoperative day resulted in a decreased length of stay, without an increased rate of readmission or wound complications, compared to a control group who rested in bed until the second postoperative day. The results of this study indicate that early ambulation following internal fixation of ankle fracture is safe, with benefits for both patients and the health service, and is now standard practice at The Alfred.

Caroline Nicolson recently concluded a randomised controlled trial comparing the inhalation of hypertonic saline to isotonic saline in patients with bronchiectasis. Improvements in lung function and quality of life were evident in both groups over 12 months of follow-up. This trial suggests that saline inhalation may be a promising treatment for people with bronchiectasis, a condition for which there are few existing treatments that improve long-term wellbeing.

The department has a growing interest in translation of research into practice. Alfred physiotherapists have participated in updating the online Pulmonary Rehabilitation Toolkit (Anne Holland and Annemarie Lee), evaluation of the uptake of ‘Physiotherapy for Cystic Fibrosis in Australia: a Consensus Statement’ (Brenda Button and Anne Holland), a study investigating the use of evidence in physiotherapy practice for treatment of patients following cardiac surgery (Kate Hayes and Anne Holland) and development of a tool to measure evidence-based practice in allied health professionals (Anne Holland and Tshepo Rasekaba).

**Current Projects**
- Randomised controlled trial of exercise training for bronchiectasis (A Lee)
- Shorter versus longer rehabilitation following lung transplantation – a randomised controlled trial (L Fuller)
- Tele-rehabilitation for chronic obstructive pulmonary disease (COPD) (A Holland)
- Randomised controlled trial of home-based versus hospital-based pulmonary rehabilitation for COPD (A Holland)
- A pilot study of exercise training for pulmonary arterial hypertension (P Munro)
- Randomised controlled trial of exercise training for people with a left ventricular assist device (K Hayes)
- Advance care planning and pulmonary rehabilitation: participation and patient perspectives (A Holland)
- Variations in care for people with COPD across health care networks (A Holland)
- Prevalence and impact of incontinence in adult men with COPD (A Burge)
- Prevalence and impact of incontinence in adult men with cystic fibrosis (CF) (B Button)
- How do allied health professionals keep up to date with current evidence? (A Holland)
- Physiotherapy for CF in Australia: uptake and acceptance of the consensus statement (A Holland, B Button)
- Positive expiratory pressure therapy during acute exacerbations of COPD – a randomised controlled trial (C Osadnik)
- Splinting for axillary burns – a randomised controlled trial (A Kolmus)
- Predicting discharge to rehabilitation following ankle fracture (L Kimmel)
- Quality of life in H1N1 survivors (C Hodgson)
- Quality of life in ARDS survivors following ECMO (T Everard)
- Predictors of outcome following chest trauma (M Dixon)
- Physical activity in people living with HIV/AIDS (S Fillipas)
- Self-reported exercise and activity levels in a population of people with Parkinson’s disease (K Richardson)
- Physical activity following hip and knee arthroplasty (P Harding)
- Physical activity in adults with CF: a longitudinal study (N Cox)

**Cochrane Reviews**
- Early mobilisation for elbow fracture in adults (P Harding)
- Airway clearance techniques for COPD (C Osadnik)
- Airway clearance techniques for bronchiectasis (A Lee)
- Breathing exercises for COPD (A Holland)
- Interventions to improve physical activity in people with CF (N Cox)

**Postgraduate Students**
- 6 PhD Students
- 1 Other Doctoral Student
- 3 Masters Students

**Publications**
- 10 Journal Articles
The Monash Alfred Psychiatry Research Centre (MAPrc) is a unique clinical translation research centre, which develops new treatments, new services and new understanding of mental disorders. MAPrc has over 100 staff and postgraduate students.

Over many years, MAPrc has worked on the clinical translation of neuroscience into innovative treatments for people with severe mental illness. Examples of new and effective approaches to therapy for people with longstanding and severe illness include estrogen as a treatment for schizophrenia and transcranial magnetic stimulation (TMS) for depression.

MAPrc conducts 13 research programs, with over 90 projects. The research programs span diverse areas, from cutting-edge neuroimaging techniques that are recognised around the world for the breakthrough insights they provide into brain structure and function in health and illness, to innovative uses of adjunctive treatments to boost the effectiveness of conventional medications for major mental illnesses, to grassroots initiatives looking at ways of increasing the efficiency of community mental health service delivery or addressing the mental health aspects of problem gambling. This reflects MAPrc's focus on bench to bedside research, where results translate directly into everyday benefits for people with mental illnesses, carers and healthcare professionals.

For a full list of MAPrc research projects and outcomes, go to www.maprc.org.au

Women's Mental Health Program
Professor Jayashri Kulkarni

With ten projects, the women's mental health program involves the development of novel treatments with estrogen, progesterone and selective estrogens for women with schizophrenia, perimenopausal depression and bipolar affective disorder. The National Register for Antipsychotic Medications in Pregnancy (NRAMP) is an important large project in this area. The program provides advice for state government committees, obstetric hospitals nationally and other related health care facilities about the most appropriate antipsychotic medication to use in pregnancy.

2010 saw the launch of the MAPrc Women's Mental Health Clinic, which is a second opinion specialist clinic providing expert psychiatric consultation for women by Professor Kulkarni, Dr Dielle Felman, advanced psychiatry registrars and a senior endocrinology registrar.

Brain Stimulation and Neuroscience Program
Professor Paul Fitzgerald

With 24 projects, this research program involves the use of TMS, MST, transcranial direct current stimulation and deep brain stimulation as methods of developing biomarkers for mental illnesses and using these for innovative treatments for depression, schizophrenia and bipolar affective disorder. 2010 saw the translation of brain stimulation technology in the continuation of magnetic seizure therapy as a new treatment for depression in Alfred Psychiatry.

Neural Diagnostics Program
Dr Brian Lithgow

In 2010, Dr Lithgow and Professor Kulkarni won the Grand Final of the ABC television program, The New Inventors, for the development of the EVestG™ ear probe diagnostic tool, dubbed 'the ECG of the mind'. Following this significant win, Commercialisation Australia have awarded a grant to develop the probe to distinguish between the difficult diagnoses of bipolar disorder and unipolar depression.

Cognitive Neuropsychology Program
Associate Professor Susan Rossell

With 11 projects, this research program involves the development and use of highly specific cognitive testing in conjunction with neuroimaging to understand the role of cognitive impairment in schizophrenia and depression. This team has developed novel psychological treatments for persistent auditory hallucinations. 2010 saw the successful development of the Voices Clinic, which is a clinical translation of cognitive techniques to treat intractable auditory hallucinations. The Voices Clinic is unique in Australia and is a direct translation from cognitive neuroscience research conducted by Associate Professor Susan Rossell and Dr Neil Thomas. There is a clear need for this type of service, given the limited availability of psychological treatments for patients with severe mental illness. The Voices Clinic is a tertiary service that provides evidence-based psychological treatment to patients, in addition to their regular treatment from public mental health services or private psychiatrists.

Psychopharmacology Program
Dr Siva Ilancheran

With nine projects, this program involves the development and conduct of clinical trials of new medications in schizophrenia, depression, bipolar disorder and anxiety disorder. 2010 saw several new medications for schizophrenia and depression being successfully administered to patients.
trialed. New medications with fewer side effects are desperately needed for people suffering from mental illnesses and these trials assist in making new treatments possible.

Healthy Lifestyles and Outcomes Program
Sacha Filia
Healthy lifestyle and outcomes projects address the significant cardiovascular risks for many patients with schizophrenia. Packages of treatment for smoking cessation and weight loss for people with schizophrenia have been developed. 2010 saw significant breakthroughs in assisting people with schizophrenia to stop smoking cigarettes, thereby improving their overall general physical wellbeing.

Service Related Research Program
Dr Stuart Lee
With eight projects and support for a range of quality improvement projects delivered by clinical staff, this stream is focused on improving the quality of treatment delivered by psychiatric services. Projects in 2010 included Artbeat (a combined music and art therapy intervention in acute psychiatry); training and intervention delivered by a state wide problem gambling mental health partnership; and evaluating the impact of a state wide psychiatric intensive care service. A highlight was the securing of funding to establish a choir for people with aphasia.

Highlights
Dean’s Award for Excellence in Research
Dr Kate Hoy was awarded the Monash University Faculty of Medicine, Nursing and Health Sciences Dean’s Award for Excellence in Research (Early Career) 2010 for achieving the highest levels of sustained excellence in research over the last five years. Having graduated only three years ago, she has generated considerable research output (30 peer-reviewed articles, h-index of 8, $734,000 in research funding). As Team Co-ordinator of the Brain Stimulation and Neurosciences Team, Dr Hoy plays a central role in the development and assessment of novel brain stimulation therapies for patients with treatment resistant mental illness.

Launch of the Women’s Mental Health Clinic
The Women’s Mental Health Clinic was officially opened on Thursday 28 October by Victoria’s Cabinet Secretary and Member for Prahran, Tony Lupton MP. Shadow Minister for Mental Health, Mary Wooldridge, was a guest speaker at the launch.

Professor Kulkarni called for greater community awareness of gender-specific aspects to many mental health disorders, including perimenopausal depression, menstrual cycle related mood disturbances, and psychosis in bipolar affective disorder affecting women.

MAPrc in the Media
MAPrc had considerable media attention in 2010. A highlight was being awarded first place honours on ABC’s The New Inventors for EVestG™, a new diagnostic tool for detecting mental illnesses and other neurological conditions, developed at MAPrc. The innovative device was invented by Monash University engineer Brian Lithgow in collaboration with Professor Kulkarni. Called ‘EVestG™’ (short for electrovestibulography) by commercial partner Neural Diagnostics Pty Ltd, the tool measures patterns of electrical activity in the brain’s vestibular (or balance) system against distinct response patterns found in disorders such as depression and schizophrenia. Ongoing research has found distinct response patterns that distinguish different diseases from each other and from regular electrovestibular activity.

Fundraising Initiatives
The annual de Castella Fun Run continues to be a significant fundraising event for MAPrc. The 2010 event was held on Sunday 29 August, and attracted more than 700 entrants. Marathon champion Robert de Castella presented race winners with their awards. For more details, see www.decastellarun.com.au

The 2010 Art for Mental Health Research Exhibition and Auction was held on Thursday 12 November at the Blue Door Gallery in South Melbourne. This event was highly successful and raised nearly $10,000 to support mental health research.

Postgraduate Students
29 PhD Students
11 Other Doctoral Students
3 Masters Students

Publications
45 Journal Articles
The Psychology Department provides clinical psychology and clinical neuropsychology services to patients of The Alfred.

Alfred Psychology is actively involved in providing research and evaluation as well as education and consultation to staff and community organisations. The department is strongly committed to the teaching and training of postgraduate students (provisional psychologists), and offers clinical placements to clinical psychology and clinical neuropsychology masters and doctoral students.

As part of Alfred Psychiatry, clinical psychology assessment and treatment services are provided to children, adolescents and adults. Within the acute hospital, clinical psychologists are involved in the assessment and treatment of patients who present with psychological problems such as depression, anxiety and adjustment issues. Clinical psychologists are attached to the Cystic Fibrosis, Oncology and HIV Services and the Hospital Admission Risk Program.

Current Projects
In conjunction with Monash Alfred Psychiatry Research Centre, senior clinical psychologist Dr Neil Thomas is involved in a number of research projects on psychological models and therapies for schizophrenia-related disorders. These include a randomised controlled trial of acceptance and commitment therapy (ACT) for medication-resistant psychotic symptoms, an emergent therapy that has attracted substantial clinical interest. This trial will be the world’s first trial of this therapy in chronic psychosis, and one of the most rigorously conducted trials of ACT internationally to date. Other projects include thinking processes involved in delusions, perceptual processing in auditory hallucinations, psychosis following traumatic brain injury, therapeutic processes and mechanisms of change in psychological therapies for psychosis, and peer-facilitated interventions for people with psychosis.

Monash University Psychology Honours student, Brindha Pillay, investigated the psychosocial impact of haematopoietic stem cell transplantation on relative donors. The aim of the study was to explore the psychosocial impact of stem cell donation before, during and after donation, and to gain insight into donors’ experience of the preparation for, and procedures associated, with donation. Participants included 13 men and nine women, with a mean age of 53.1 years, who donated stem cells or bone marrow to a relative between 2007 and 2010 at The Alfred. The results revealed that a broad range of positive and negative emotions are experienced at different time points during the donation process, with the psychosocial impact of donation influenced by factors such as the pragmatic aspects of the donation process, family dynamics, perceived adequacy of preparation and emotional support, and uncertainty related to health outcomes for the recipient and donor. The implications of the results will be used to improve the provision of psychosocial services for donors. This was a joint project between the Psychology Department, Patient and Family Services, Monash Alfred Psychiatry Research Centre and Cabrini Monash Psycho-oncology Research Unit.

Senior Clinical Psychologist, Kathleen Troup, led a project involving the implementation and evaluation of dialectical behaviour therapy (DBT) in an Australian community mental health setting for people with Borderline Personality Disorder. Data were collected for 20 clients over seven years at pre-treatment, mid-treatment and post-treatment. Clients were assessed using a range of self-report measures. Utilisation of Inpatient, Emergency Department, and Crisis Assessment and Treatment Team services for two years before and after treatment was also obtained. Significant improvements were found from pre- to mid-treatment, and from pre- to post-treatment in trait anxiety, affective control, quality of life and coping. Significant improvement in depression was found after two rounds of DBT skills training modules. Additionally, utilisation of crisis services decreased significantly after two rounds of skills modules.

Neuropsychologist Dr Rubina Alpitsis studies cognitive outcomes in hepatitis C patients, investigating of the effects of the virus on cerebral function, specifically cognition and P300. She also participates in an NHMRC-funded study into the cognitive outcomes of deep brain stimulation surgery for older patients with Parkinson’s disease.

Dr Maxine Braithwaite, Senior Clinical Psychologist, works on improving adherence to treatment in cystic fibrosis patients. A randomised control trial with the intervention of direct pharmacy dispensing, and motivational interviewing is in progress.

Dr Michelle Earle, Senior Clinical Psychologist, investigates sexual compulsivity, sexual sensation seeking and global mental health in men who have sex with men presenting to the Psychology Clinic within the Victorian HIV Service.

Kathleen Troup, Senior Clinical Psychologist.

Postgraduate Students
2 Doctor of Psychology Students
3 Masters Students

Publications
2 Journal Articles
William Buckland Radiation Oncology (WBRO) has continued research efforts in radiation oncology medical physics, clinical trials, image-guided radiation treatment/stereotactic techniques, and in specific tumours such as those of the CNS, breast, prostate, head and neck. WBRO has an outstanding dataset containing patient, disease, treatment and outcome details of all patients treated over the 18-year history of the centre, which acts as a resource for reviews of outcomes for specific subsets of patients. This scientific effort has led to consistent and ongoing modifications in the way in which we treat our patients, applying radiation research to the radiation ‘bedside’.

**Highlights**

- WBRO staff were chief investigators in a number of collaborative research projects awarded almost a million dollars in NHMRC and Victorian Cancer Agency grants in 2010
- Ryan Smith received a conference grant from RMIT University to attend the 11th Workshop on Electronic Portal Imaging in Belgium
- Joanne Brooker submitted her PhD thesis on quality of life outcomes among acoustic neuroma patients
- WBRO fulfilled the requirements to become a European Organisation for Research and Treatment of Cancer (EORTC) accredited radiation oncology department
- WBRO was accepted to participate in the Trans Tasman Radiation Oncology Group (TROG) Assessment of New Radiation Oncology Technology and Treatments (ANROTAT) project
- Development of the Surveillance Therapy Against Radical Treatment (START) trial in Australia

**Current Projects**

- Scatter measurements with intensity modulated radiotherapy treatments (J Ruben)
- Factors to be used with IAEA TRS398 for low kilovoltage x-rays (T Ackerly)
- Synchrotron microbeam radiation therapy (J Crosbie)
- Glioblastoma multiforme patient treatments and outcomes June 2005-June 2006 (A Sutherlandhouse)
- Primary chemotherapy with temozolomide versus radiotherapy in patients with low grade gliomas after stratification for genetic 1p loss: a Phase 3 study (J Ruben)
- Whole brain radiotherapy following local treatment of intracranial metastases of melanoma – a randomised Phase 3 trial (J Ruben)
- Neurocognitive function in AVM patients (M Dally)
- Stereotactic radiosurgery for treatment of Cushing’s disease (L Wein, M Dally)
- A long-term outcome for glomus jugulare tumours treated with radiotherapy at one institution (R Limb, M Dally)
- PRIME Phase 2 – Scottish Breast Cancer Trials Group: post-operative radiotherapy in minimum-risk elderly (K Taylor)
- Phase 3 study of radiation doses and fractionation schedules in non-low risk ductal carcinoma in situ of the breast (K Taylor)
- Breast bolus: can 2mm bolus for the whole course replace the use of 5mm bolus for two regimes? (K Taylor)
- POST – post-operative concurrent chemo-radiotherapy versus post-operative radiotherapy in high-risk cutaneous squamous cell carcinoma of the head and neck (S Davis)
- RadioHum – radiotherapy with humidification in head and neck cancer (S Davis)
- Oropharyngeal SCC treated with radiotherapy: a 16-year experience at WBRO (N Haghighi, S Davis)
- TOAD – a collaborative randomised Phase 3 trial: the timing of intervention with androgen deprivation in prostate cancer patients with a rising prostate specific antigen (J Millar)
- Improving treatment with permanent 125iodine seed implants for prostate cancer using dosimetry with either fused CT/MR images or fused CT/US images (R Smith)
- Development of a population-based prostate cancer clinical registry (J Millar)
- RAVES – a Phase 3 multicentre randomised trial comparing adjuvant radiotherapy with early salvage radiotherapy in patients with positive margins or extraprostatic disease following radical prostatectomy (B Matheson)
- Outcomes after ‘top up’ in men implanted with radioactive iodine seeds for the treatment of prostate cancer (S Miller)
- A Phase 3 international randomised trial of single versus multiple fractions for re-irradiation of painful bone metastases (B Matheson)
- PETACC-6 – preoperative chemoradiotherapy and postoperative chemotherapy with capecitabine and oxaliplatin versus capecitabine alone in locally advanced rectal cancer (J Shapiro, I Porter)
- Registry of Clinical Cancer Trials in Southern Melbourne enlarged to form the Victorian Cancer Trials Link (J Millar with DEPM)
- Quality of life in stage 1 seminomatous germ cell tumour patients treated with either adjuvant carboplatin chemotherapy, adjuvant radiotherapy, or high intensity chemotherapy (J Lewin, J Millar)
- Review of Alfred rectal cancer patients treated with radiation (A Tafreshi, L Kirsbaum, J Millar)
- Initial evaluation of the AlignRT surface imaging system (K Fox)

**Postgraduate Students**

- 1 PhD Student
- 3 Masters Students

**Publications**

- 8 Journal Articles
The ageing population and the burden of chronic disease are firmly entrenched as challenges for the Australian healthcare system. Caulfield Hospital provides health care services across Rehabilitation, Aged Care, Residential Care and Aged Psychiatry in both inpatient and community and ambulatory settings, and is therefore well placed to meet these challenges.

During 2010, Caulfield Hospital continued to foster and develop a growing research culture. It is intended that this will contribute significantly to the implementation of effective translational research and interdisciplinary and person centred models of care, with links to defined clinical outcomes in areas of greatest need.

One of the key achievements in 2010 was the development of the 2011-2013 Caulfield Hospital Research Strategy, building on the achievements of the 2007-2011 Caulfield Hospital Research Strategy. Research Program Areas were identified which reflected the range and diversity of Caulfield Hospital services across medicine, nursing and allied health, and outlines the priorities and drivers of research fundamental in delivering the aims outlined in Alfred Health’s strategic plans. The following Research Program Areas will become the focus for research activity over the next three years:

- Innovative models of care
- Management of chronic disease
- Mental health and cognition
- Health promotion
- Improving physical and functional outcomes
- Pain management and treatment

The evolution of a nationally recognised research culture at Caulfield Hospital continues with the following notable achievements in 2010:

- Caulfield Hospital Grants Program awarded $50,000 in internal grant funding to Caulfield staff facilitating four new small projects and one major new research project
- Seven externally funded research projects attracting $790,311 and two clinical trials funded for $182,383 during 2010

A regular, committed and ongoing Caulfield Hospital Research Interest Group with monthly meetings held and monthly research newsletters distributed to all Caulfield staff

Greater focus on research as a part of Caulfield Week and the implementation of the Caulfield Week Mini Poster Presentation session

Development of a Research Coordinator role to assist in the implementation of the Caulfield Hospital Research Strategy: Nicole Austin commenced in this position in January 2010 and has provided extensive support to research activities across the hospital and its programs

Aged Care Services

One of the key priorities for Aged Care Services was the development of discrete projects that allowed advanced trainee geriatric medicine registrars to complete their research projects, while still ensuring the overall goals of the clinical program were met. During 2010, the areas of aged psychiatry, trauma in the elderly, osteoporosis, falls/nutrition/sarcopenia, and community geriatrics were identified. Research projects were undertaken within these areas to ensure the continued development of an effective skill and knowledge base in 2011. Of note was the award to Dr Chris Moran by the Australian Society for Geriatric Medicine (Victorian Committee) for the most outstanding advanced trainee presentation on ‘Outcomes of cervical spine immobilisation post fracture in older people’.

Rehabilitation Services

The Spinal Rehabilitation Unit

The Spinal Rehabilitation Unit offers a specialised statewide interdisciplinary clinical service for individuals with non-traumatic spinal conditions, including multiple sclerosis, transverse myelitis, spinal cord ischaemia, cancer related spinal impairment, spinal infections and spina bifida. Research activity is strong, with the following projects completed for publication in 2010:

- Costs and adverse events associated with hospitalisation of patients with spinal cord injury (SCI) in Victoria (New PW, Jackson T)
- A multidisciplinary consultation team to address the unmet needs of hospitalised SCI patients (New PW)
- The importance of early diagnosis of herpes zoster myelitis (Ong LWO, Churchyard AC, New PW)

Ongoing research in the Spinal Rehabilitation Unit includes:

- Comparison of traumatic and non-traumatic SCI
- Quality of life in adults with SCI
- Survival after rehabilitation for SCI due to tumour
- Comparison of the management of the patient in specialised and non-specialised rehabilitation units
- Management of the SCI patient during admission and discharge
- Rehabilitation outcomes of SCI due to tumour
- Bladder and urodynamics outcomes in a retrospective case series of patients with non-traumatic SCI
- Functional outcomes of the SCI patient with acute spinal cord ischaemia
- Improving outcomes of the SCI patient in the acute setting

Dr Ettie Ben-Shabat (left) and Dr Mithu Palit investigate the effects of botulinum toxin A injections for treatment of lower limb dystonia.
Aged Psychiatry
An investigator initiated study investigating the neuropsychological characteristics of patients referred with senile squalor (Macfarlane S, Kotsios C, Mastwyk M) is under way. Participation in clinical trials into Alzheimer’s disease included:
• Effect of passive immunisation on the progression of Alzheimer’s disease: solanezumab (LY2062430) versus placebo (Macfarlane S)
• Exploratory study of S38093 versus placebo in patients with mild to moderate Alzheimer’s disease (Macfarlane S)

Clinical Innovations and Interdisciplinary Projects
The Clinical Innovation and Interdisciplinary Projects team supports quality improvement projects across the hospital and its programs, and is also responsible for the management of the research strategy implementation and the Advance Care Planning program. In addition to the valuable work of the Research Coordinator in developing and driving the research strategy for Caulfield Hospital, a number of research projects have been generated.

Findings from the under nutrition pilot study are translated into a Lunch Club initiative at the Glen Eira Nursing Home. Residents are encouraged to eat in a social setting, free from interruption.

The results from the pilot study ‘Reducing functional decline due to under nutrition in older patients’ (Marshall K, Hunter P, Gill L, Gordon A) were incorporated into the Victorian Department of Health’s Best Care for Older People Everywhere toolkit. This exciting initiative was launched in 2010 and designed to assist health services by identifying tools and resources to assist them in the provision of improved care for the older person while in hospital and following discharge. Furthermore, the findings from this pilot study are being expanded to include residential care at Caulfield Hospital. Findings were presented at the Best Care for Older People Conference in September 2010.

Other current projects include:
• Does offering an advance care planning service to people recently diagnosed with dementia or mild cognitive impairment by the Cognitive, Dementia and Memory Service clinic lead to completion of advance care planning documentation? (Nicholos M, Lewis M, Rand E, Mullaly L, Macfarlane S, Hunter P)
• Advance care planning and pulmonary rehabilitation: a pilot project (Holland A, Miller B, Lee A, Nicholos M, Burge A, Purcell S)

Community and Ambulatory Services
Community and Ambulatory Services provide community based therapeutic interventions that may improve function and/or prevent the deterioration of existing conditions.

The Cardiac Rehabilitation Unit (CRU)
The CRU provides a comprehensive multidisciplinary approach to rehabilitate patients who have experienced a cardiac event, heart failure or require risk factor modification. Research projects include:
• Phase 3 Cardiac Rehabilitation – a collaborative pilot project between CRU and Caulfield Community Health Service (Wise F, Sheppard R, Patrick J, Corben K)
• Determination of the minimal clinically important difference for the 6 minute walk test in heart failure (Wise F, Holland A, Sheppard R)

Caulfield Pain Management and Research Centre
The centre provides specialist assessment and treatment for adults with chronic non-malignant pain and cancer survivors with chronic pain, and conducts research on outcomes of pain treatments, psychosocial aspects of chronic pain, pain and ageing and novel therapies for pain. Current projects:
• Investigating a novel therapeutic intervention for chronic pain following neurotrauma (Miller SM, Ngo TT, Gibson SJ)
• Investigating caloric vestibular stimulation as a novel therapeutic intervention for chronic pain, mania and depression (Ngo TT, Gibson SJ, Fitzgerald PF, Miller SM)
• Effect of electroacupuncture on opioid consumption by patients with chronic musculoskeletal pain: a randomised controlled study (Xue C, Zheng Z, Gibson SJ, Helme RD)
• The effect of combined therapies of electroacupuncture and cognitive behavioural therapy on chronic tension-type headache: a randomised controlled clinical trial (Greenwood K, Xue C, Zheng Z, Gibson SJ)
• Optimising pain management in frail older people (McLachlan A, Nanganathan V, Le Couteur D, Hilmer S, Gibson SJ)

Nursing
The development of nursing research is a key focus in the overall evolution of a research culture at Caulfield Hospital. In 2010, a Nursing Services Research Committee was established to assist in facilitating and supporting the development of research projects.

Allied Health
Allied Health offers an intensive and diverse range of services to Caulfield Hospital’s rehabilitation and aged care clients in a multidisciplinary team environment.

Research projects within the Spasticity Management Clinic:
• Botulinum toxin A injections for treatment of lower limb dystonia
• Inter-rater and intra-rater reliability of the Tardieu Scale for assessment of the leg muscles
• Comparisons of the gait patterns of people with lower leg dystonia and spasticity
• Botulinum toxin injection for management of muscle overactivity – a longitudinal study of outcomes
• Sensitivity of functional outcome measures to change following Botulinum toxin injection of the lower limb

Publications
20 Journal Articles
5 Book Chapters

REHABILITATION, AGED AND COMMUNITY CARE
The Department of Rheumatology researches the prevention and treatment of arthritis, particularly osteoarthritis (OA). We have undertaken a number of clinical trials in OA that cover a wide spectrum of therapeutic strategies from orthotics to vitamin D to stem cell transplantation. By using MRI-based assessment of the knee and hip joints, we have been able to examine the role of lifestyle factors such as physical activity and obesity prior to the development of clinical disease. This offers a novel approach to determining what is good or bad for joints. For example, we showed that contrary to widespread belief, physical activity is good for knee joints, the exception being situations where joint injury co-exists.

The effect of obesity on joints is proving interesting. Our results suggest that the effect of obesity is not simply due to loading on the joints, but that obesity affects joints by both loading and metabolic factors. This has raised the interesting concept of obesity related meta-inflammation (metabolic triggered inflammation) potentially playing an important role in the progression of OA.

In 2010, Professor Flavia Cicuttini was awarded the triennial Parr Prize for Research by the Australian Rheumatology Association (ARA). PhD student Dr Andrew Teichtahl was awarded the New Investigator Prize at the ARA national meeting, and research fellow Dr Donna Urquhart and student Dr Andrew Teichtahl was awarded the New Investigator Prize at the ARA national meeting. Professor Flavia Cicuttini MBBS(Hons), MSc, PhD, FRACP, FAFPHM

Key research findings:
- Sharon Brennan, PhD student, showed that avoiding weight gain in women during early to middle age is likely to have a significant impact on the risk of knee OA in a publication in *Arthritis Research Therapy*.
- As part of her PhD, Trish Berry showed in a publication in *Arthritis and Rheumatism* that higher bone remodelling is associated with reduced cartilage loss. This suggests that targeting bone may provide a new approach to treatment and prevention of knee OA.
- In publications in *Arthritis Research and Therapy* and *Rheumatology* respectively, PhD student Stephanie Tanamas showed that both bone cysts and bone marrow lesions predict the risk of joint replacement in people with knee OA, providing evidence for the importance of bone pathology in disease progression.
- Postdoctoral research fellow Dr Miranda Davies-Tuck published in *Arthritis Research Therapy* the finding that bone marrow lesions are structural changes in the knee that have a fluctuating course which includes resolution. This is associated with improvements in the knee cartilage and thus reduced risk of development of OA. Thus these lesions are potential targets in the prevention of knee OA. This observation was followed with the intriguing finding that higher levels of total serum cholesterol and triglycerides are associated with bone marrow lesions, suggesting a link between vascular disease and OA.
- Studies on the importance of dynamic knee loading on development of bone marrow lesions in OA were published in *Annals of the Rheumatic Diseases*. This was followed by further work showing that dynamic knee loading is also related to cartilage and bone changes in knee OA.
- Trish Berry and Anita Wluka, in a publication in *Rheumatology*, showed that the effect of obesity is not just due to loading of the joint, but that fat mass and muscle mass have different effects on the knee structure. In a further publication in *Arthritis and Rheumatism*, they showed that serum adipokines may provide a non-mechanical link between obesity and joint integrity, by mediating bone and cartilage protein turnover, and subsequent cartilage volume loss.
- Research fellow Dr Changhai Ding examined the associations between non-steroidal anti-inflammatory drugs (NSAIDs) and changes in knee cartilage volume. Comparing users of cyclooxygenase-2 inhibitors with users of conventional NSAIDs, the latter had higher knee cartilage volume loss, supporting the notion of a differential effect on knee structure. This was published in the *American Journal of Medicine* and has significant implications for the management of patients with knee pain.
- Dr Yuanyuan Wang, in a publication in *Rheumatology*, demonstrated the importance of a healthy meniscus in maintaining a healthy joint. She found that meniscal extrusion was associated with subchondral bone marrow lesions, bone cysts and expansion of subchondral bone in OA knees.
- Dr Donna Urquhart and Trish Berry showed that increased fat mass is associated with high levels of low back pain intensity and disability. The work was published in *Spine* and provides a new approach to our understanding of the effect of obesity on back pain and disability.

Postdoctoral fellow, Dr Fahad Hanna, and visiting research fellow from Sri Lanka, Dr Pushpika Wijethilake, examine the knee magnetic resonance image of a study participant.
A pilot study investigating the relationship between the level of compliance with a swallowing exercise program and swallowing outcomes for patients with head and neck cancer undergoing (chemo)radiotherapy:

The Speech Pathology Department received a grant of $29,249 from the Southern Melbourne Integrated Cancer Service (SMICS) to fund this study. The principal researcher is Amanda Dwyer who works with head and neck cancer patients at the William Buckland Centre.

The study aims to improve care for head and neck patients with swallowing problems. These problems are frequently experienced following radiotherapy to the head and neck area and result in a reduction in the quality of life. Previous research has reported that exercises to stretch and strengthen muscles during and following (chemo)radiotherapy can improve swallowing function. This study examines the efficacy of an exercise program on swallowing ability and quality of life.

A range of patient information including treatment modality, the site and stage of cancer, gender, psychosocial history, geographical location and social support will be collected. The patients will be given a swallowing exercise program two weeks prior to commencing their (chemo)radiotherapy and instructed to complete the exercise program daily until three months post completion of their treatment. Swallowing function will be assessed using videofluoroscopy prior to commencing the exercise program and at three and six months post (chemo)radiotherapy. Measures of patients’ oral intake, weight, tongue strength, range of jaw movement, extent of oral health side effects and quality of life will also be taken. To establish if there is a relationship between compliance with the exercise program and swallowing outcomes, the patients will be also requested to record the number of times exercises are completed.

Changes in the diameter of the recurrent laryngeal nerve during thyroid surgery and the relationship of this to voice changes following surgery: a collaborative project between Speech Pathology, ENT and Endocrine Surgery:

The Speech Pathology Department participates in this collaborative study with Professor Jonathan Serpell from the Department of General Surgery. Speech pathologists Miriam Voortman and Jessica Hayward are involved in collecting data using the lingWAVES voice analysis system. This evaluates the vocal function of patients before thyroid surgery, one day post surgery and at three months post surgery.

Other Achievements

Gulsen Ellul presented the results of a project that benchmarked the management of orofacial contractures in burns units across Australia and New Zealand at the Speech Pathology Australia 2010 conference and at the Australian and New Zealand Burns Association 2010 conference. She received the award for best allied health presentation at the Australian and New Zealand Burns Association conference, and plans to use the results to develop a study examining the efficacy of specific interventions.

Tanya Blyth presented the results of a study, 'The effective assessment of high level cognition based communication disorders in traumatic brain injury', to the Speech Pathology Australia 2010 conference and the International Brain Injury Association 2010 conference in Washington, USA. This was a collaborative study with the Occupational Therapy Department and was funded by the RACV Sir Edmund Herring Memorial Scholarship.
The Monash Department of Surgery at The Alfred is a department of the Monash University Central Clinical School and is affiliated with the Department of Surgery at Cabrini Health, headed by Associate Professor Paul McMurrick. Associate Professor McMurrick has an academic interest in colonic cancer research and medical education, and has developed a Monash-wide colorectal surgery database with Monash colorectal surgeons.

The Monash Vision Direct to Brain Bionic Eye project began in 2010. Professor Rosenfeld is a principal investigator with a team of experts in engineering, physiology, ophthalmology and medical imaging who, in partnership with industry, aim to restore some useful vision to selected blind individuals. The Monash Vision Direct to Brain Bionic Eye project is developing a cortical implant in contrast to a retinal implant. This approach may have a wider range of applications than the retinal device.

Professor Jonathan Serpell, Head of General Surgery at The Alfred, has developed a Monash-wide endocrine surgery database and continues to promote and conduct a wide range of surgical research activities at The Alfred. Professor Russell Gruen is Director of the National Trauma Research Institute (NTRI), Professor of Surgery and Public Health at Monash University, and a general and trauma surgeon at The Alfred. Under his direction, NTRI leads improvements in the care of severely injured people locally, nationally and internationally through stakeholder dialogue, research leadership, knowledge translation and performance improvement activities.

The Department of Surgery has many dedicated adjunct staff members who contribute to its research programs and are actively engaged in the teaching of Monash University medical students. The Department of Surgery encourages medical students at Monash University who are interested in surgical careers and promotes the Bachelor of Medical Science program.

The DS Rosengarten Surgical Trainee Research Prize for 2010 was awarded to Master of Surgery student, Dr Krish Chaudhuri.

**Current Projects**

**Burns Laboratory**
- Cellular therapies for burn wound management/skin tissue engineering
- Burn wound clinical management protocols
- Mortality and long term outcomes after severe burn injury
- Australian and New Zealand Burns Quality Registry (with DEPM)

**Cardiothoracic Surgical Research**
For a list of current projects, see page 31.

**General Surgery Research – Breast, Endocrine, Colorectal and Upper Gastrointestinal**
For a list of current projects, see page 41.

**Neurosurgical Research**
For a list of current projects, see page 55.

**Orthopaedic Research**
For a list of current projects, see page 61.

**Trauma Research**
For a list of current projects, see pages 52-53.

**Postgraduate Students**
- 6 PhD Students
- 2 Masters Students

**Publications**
- 38 Journal Articles
- 2 Book Chapters
The Women's Health Program undertakes research and provides education about common health issues that affect women throughout adult life and the impact of menopause and role of sex hormones (estrogen and testosterone) on health and wellbeing. The research program includes studies addressing the effects of menopause; prevention of diabetes, dementia, breast cancer and urinary incontinence (UI); and improving wellbeing, sexual function and optimising quality of life after breast cancer.

**Major Research Findings**

- Developed and published a new tool (PROSPECT) for GPs to identify women aged 70 and above who are most likely to need treatment to prevent fracture if radiological imaging is undertaken. This will enable more targeted screening in the community.
- From a longitudinal study, we reported that UI has a dynamic time-course with relatively high incidence and resolution rates, but with an overall trend of increasing prevalence with age. There were few women with UI receiving treatment with proven efficacy, suggesting significant barriers.
- We reported on the relationship between hormone therapy use at the time of diagnosis of breast cancer and tumor characteristics. Importantly, our data shows that Australian women who were taking HRT at the time their breast cancer was diagnosed did not have more advanced disease.
- We investigated the use of complementary and alternative therapy (CAM) amongst women with breast cancer and found the frequency of use of CAMs in common usage for menopausal symptoms by women with breast cancer was lower than anticipated, increased with time from diagnosis and is associated with more severe menopausal symptoms.

**Research Achievements**

- NHMRC Project Grant: Selective estrogen receptor modulators (SERMs) – a potential new treatment for child bearing age women with schizophrenia (J Kulkami, S Davis): $205,016
- NHMRC Project Grant: Transdermal testosterone therapy: a potential treatment for selective serotonin reuptake inhibitor (SSRI)-associated sexual dysfunction in women (S Davis, R Bell, J Kulkami): $235,295
- Victorian Cancer Agency Fellowship (R Bell)

**Screening Tool for Osteoporosis**

Although bone density by dual-energy X-ray absorptiometry (DEXA) is the standard measure for the diagnosis of osteoporosis, as a screening tool it has significant cost and is not universally available. PROSPECT (Prospective Screening for Osteoporosis; Australian Primary Care Evaluation of Clinical Tests) was a national study undertaken to develop an effective pre-screening tool to be used in primary care to facilitate targeted assessment of women aged 70 years and over for prevention of osteoporotic fractures. This study was undertaken in conjunction with the Monash University School of Primary Health Care and Servier Laboratories. The resultant decision support tool for osteoporosis screening will be introduced to GPs across Australia throughout 2011 and can be accessed via the Women’s Health website. The tool assists health care practitioners in evaluating which of their female patients aged 70 and over need a bone density test and a plain X-ray. The tool uses three clinical risk factors: body mass index, rib-pelvis distance and use of estrogen.

**Current Projects**

- **Waistline study: metformin for the management of insulin resistance in overweight women at midlife** (S Davis, R Bell, F Jane)
- **ATLAS: Adjuvant Tamoxifen Longer Against Shorter** (S Davis)
- **Assessment of knee joint articular cartilage volume change in women with breast cancer treated with anastrozole or letrozole and comparison with untreated controls** (S Davis, R Bell)
- **The effect of transdermal testosterone gel 300mcg daily on cognitive performance in older postmenopausal women: a randomised placebo controlled trial** (S Davis, R Bell)
- **BUPA Health Foundation Health and Wellbeing after Breast Cancer Study** (S Davis, R Bell)
- **The effect of transdermal testosterone patch (Intrinsa®) on cognitive performance in older postmenopausal women: a randomised placebo controlled trial** (S Davis, S Davison)
- **Effects of metformin on the LKB1/AMPK pathway in breast tissue, a randomised clinical trial** (S Davis, E Simpson, K Brown, R Bell)
- **A randomised double-blind placebo-controlled trial to assess the effects of 17 beta-oestradiol 1mg + drospirenone 2mg administration on cognitive function in early postmenopausal women** (S Davis, F Jane, R Bell)
- **Multicentre, double-blind, randomised study to investigate the impact of a sequential oral contraceptive containing estradiol valerate and dienogest (SH T00658ID) compared to a monophasic contraceptive containing ethinylestradiol and levonorgestrel (Microgynon) over 6 treatment cycles on alleviating complaints of reduced libido in women with acquired female sexual dysfunction associated with oral contraceptive use** (S Davis, F Jane)
- **Transdermal testosterone therapy: a potential treatment for SSRI-associated sexual dysfunction in women** (S Davis, R Bell)

**Postgraduate Students**

- 3 PhD Students

**Publications**

- 13 Journal Articles
- 1 Book Chapter
Alfred Research Trusts Strategic Grants

Professor Leon Bach
Department of Endocrinology and Diabetes
(Medical Research Trust)

Professor Peter Cameron
Emergency Medicine
(Medical Research Trust)

Professor Jamie Cooper
Intensive Care Unit
(Marian & Edwin Harold Flack Trust)

Professor Anthony Dart
Department of Cardiology
(Marian & Edwin Harold Flack Trust)

Professor Michael Dooley
Department of Pharmacy
(Sol Green Trust)

Professor Don Esmore
Cardiothoracic Surgery Department
(Sol Green Trust)

Associate Professor Mark Fitzgerald
Trauma Services
(Medical Research Trust)

Professor Paul Fitzgerald
Monash Alfred Psychiatry Research Centre
(Edward Wilson Trust)

Professor Russell Gruen
National Trauma Research Institute
(Sir William Phillip Trust)

Professor Jayashri Kulkarni
Monash Alfred Psychiatry Research Centre
(Edward Wilson Trust)

Professor Sharon Lewin
Infectious Diseases Unit
(Medical Research Trust)

Professor Fabienne Mackay
Department of Immunology, Monash University
(Marian & Edwin Harold Flack Trust)

Professor Catriona McLean
Anatomical Pathology
(Paula Josephine Jung Trust)

Professor John McNeil
Department of Epidemiology and Preventive Medicine, Monash University
(Sir William Phillip Trust)

Associate Professor Jeremy Millar
William Buckland Radiation Oncology
(Peter Grant Hay Trust)

Professor Paul Myles
Anaesthesia and Perioperative Medicine
(Sol Green Trust)

Professor Robyn O’Hehir
Allergy, Immunology and Respiratory Medicine
(Marian & Edwin Harold Flack Trust)

Professor Jeffrey Rosenfeld
Department of Surgery, Monash University
(Paula Josephine Jung Trust)

Professor Hatem Salem
Australian Centre for Blood Diseases
(Peter Grant Hay Trust)

Associate Professor Max Schwarz
Medical Oncology Unit
(Peter Grant Hay Trust)

Professor Jonathan Serpell
General Surgery
(Paula Josephine Jung Trust)

Associate Professor Andrew Spencer
Clinical Haematology and Bone Marrow Transplant Unit
(Patricia Leonora Anderson Trust)

Professor Elsdon Storey
Department of Radiology
(Richard Carus Choice Trust)

Professor Ken Thomson
Department of Radiology
(Peter Grant Hay Trust)

Professor Napier Thomson
Department of Medicine, Monash University
(Sir William Phillip Trust)

Nursing Research Grant
To support the research programs of the Alfred/Deakin Nursing Research Centre and the La Trobe/Alfred Clinical School of Nursing
(Donald Raymond Stuart Research Trust)

Allied Health Research Grant
Emma Ridley, Nutrition Department: ‘POLAR BEAR - the Prophylactic hypOthermia trial to Lessen trAumatic bRain injury Basal Energy Assessment Research’
(Marian & Edwin Harold Flack Trust)
**Alfred Research Trusts Small Project Grants**

**Dr Harriet Beevor**  
*Department of Anaesthesia and Perioperative Medicine*  
‘Pain processing in patients after severe burns versus a population of unaffected volunteers: a comparison’

**Mahesh Dharmakumara**  
*Department of Allergy, Immunology and Respiratory Medicine*  
‘Changes in exhaled nitric oxide levels during direct and indirect bronchial provocation tests in asthma’

**Dr Krishanu Chaudhuri**  
*Department of Cardiothoracic Surgery*  
‘A randomised controlled trial investigating carbon dioxide insufflation of the pericardial field as a neuroprotective strategy in open chamber cardiac surgery’

**Dr George Grigoriadis**  
*Haematology Unit*  
‘Defining the role of NFκB1 transcription factor in T cell neoplasms’

**Faizel Hartley**  
*Department of Allergy, Immunology and Respiratory Medicine*  
‘Why do some patients with Chronic Obstructive Pulmonary Disease (COPD) desaturate on exertion, but others do not?’

**Dr Chris Jalilian**  
*Melanoma Service*  
‘In vivo microscopic characterisation of red nodules’

**Dr Cameron Jeremiah**  
*Infectious Diseases Unit*  
‘The incidence, epidemiology, antibiotic susceptibility and typing of community onset and hospital-acquired methicillin resistant *Staphylococcus aureus* (MRSA) at The Alfred hospital’

**Dr Jeremy Lewin**  
*Medical Oncology Unit*  
‘To assess health related quality of life in stage 1 seminomatous germ cell tumour patients treated with either adjuvant carboplatin chemotherapy, adjuvant radiotherapy, or high intensity chemotherapy (PEB regimen)’

**Caulfield Hospital Research Grants**

**Major Grant** – *Ben-Shabat E, Palit M, Olver J, De Graaff S, Mooney A, Winter A, Holland A*  
‘Botulinum toxin A injections for treatment of lower limb dystonia’

**Aldous S, Holland A, Winter A, Fini N, Wild D, Palit M**  
‘Botulinum toxin injection for management of muscle overactivity – a longitudinal study of outcomes’

**Mulally L**  
‘Caregiver characteristics and reporting of apathy in memory clinic clients’

**Street P, Thompson J**  
‘Indwelling urethral catheter management post hip fracture’

**Thomas F, Gibson S**  
‘Does self efficacy predict long term functional outcomes among patients with persistent pain after attendance at a multidisciplinary pain management group’

**AMREP Research Prize**

For article describing original research published in the journal with the highest impact factor in 2009:  
**Dr Andrew Davies**  
*Intensive Care Unit*  

**GlaxoSmithKline Prize for Advanced Trainee Physicians**

**Dr Claire Gordon**  
*Infectious Diseases Unit*  
‘2009 pandemic influenza A (H1N1) infection and immunoglobulin subclass 62 deficiency’

**DS Rosengarten Surgical Trainee Research Prize**

**Dr Krishanu Chaudhuri**  
*Department of Cardiothoracic Surgery*  
‘Carbon dioxide insufflation of the pericardial field: a randomised controlled trial investigating neurocognitive outcomes’

**Kathleen AB Smith Memorial Award in Nursing**

The purpose of this award is to support and acknowledge a high standard of nursing publication that has potential for significant impact on patient care.  
**Vicki White**  
*Nursing, The Alfred*  

**Alfred Week Research Poster Prizes**

**Monash Alfred Psychiatry Research Centre Prize**

**Sacha Filia**  
*Monash Alfred Psychiatry Research Centre*  
THE HEALTHY LIFESTYLES PROJECT: REDUCING CARDIOVASCULAR DISEASE (CVD) RISK IN PEOPLE EXPERIENCING SEVERE MENTAL ILLNESS BY TARGETING SMOKING, DIET AND EXERCISE  

**Henrietta Law Memorial Prize for Allied Health Research**

**Karly Wheeler**  
*Department of Orthotics and Prosthetics*  
DETERMINING OPTIMAL HALO PIN MANAGEMENT PRACTICES TO DECREASE PIN COMPLICATIONS  
Wheeler KN, Burchall GB, Byrne MJ, Paul E, Malham GM

**Noel and Imelda Foster Prize for Cardiovascular Research**

**Leah Iles**  
*Department of Cardiology*  
MYOCARDIAL FIBROSIS PREDICTS APPROPRIATE DEVICE THERAPY IN PATIENTS WITH IMPLANTABLE CARDIOVERTER DEFIBRILLATORS FOR PRIMARY PREVENTION OF SUDDEN CARDIAC DEATH  
Lucy Battistel Prize for Allied Health Research
Caroline Nicolson  Physiotherapy Services
THE LONG TERM EFFECT OF INHALED HYPERTONIC SALINE
(6%) IN NON-CYSTIC FIBROSIS BRONCHIECTASIS

Michael J Hall Memorial Prize for Research in the Field of Respiratory Disease/Physiology
Jennifer Hislop  Department of Allergy, Immunology and Respiratory Medicine
AUDIT OF A WARD-BASED ACUTE NON-INVASIVE VENTILATION SERVICE IN A TERTIARY HOSPITAL
Hislop J, Parker K, Toghill J, Borg B, Naughton M, Young A

Professor Daniel Czarny Prize for Allergy and Asthma Research
William Figgett  Department of Immunology, Monash University
TACI IS CRITICAL FOR AUTOANTIBODY PRODUCTION IN T CELL-INDEPENDENT BAFF-DRIVEN AUTOIMMUNITY
Figgett W, Bijker M, Stokes R, Mackay F

Tony Charlton Prize for Cardiac Surgical Research
Jonathan Choong  Department of Cardiothoracic Surgery
CONTINUOUS CRYSTALLOID MICROPERFUSION PROVIDES PRESERVATION SUPERIOR TO COLD STORAGE DURING PROLONGED DONOR HEART PRESERVATION
Rosenfeldt FL, Lim YW, Choong J, Ou R

The Janet A Secatore Nursing Research Award (sponsored by Nurses First Credit Union)
Emma Cohen  Alfred/Deakin Nursing Research Centre
PATIENT PARTICIPATION IN SYMPTOM MANAGEMENT IN ACUTE ONCOLOGY: PATIENT/CLINICIAN INTERACTIONS
Cohen E, Botti M, Duke M

The Nursing Research and Access Committee Award (sponsored by Nurses First Credit Union)
Sue Wyatt  Department of Endocrinology and Diabetes
A PILOT STUDY OF ACUTE PRE-OPERATIVE INTERVENTION IN PATIENTS WITH DIABETES UNDERGOING CARDIAC SURGERY
Wyatt S, Topliss DJ, Stoney RM, Lee G

Baker IDI Heart and Diabetes Institute Prize for Cardiovascular Research
Nicholas Lam  Baker IDI Heart and Diabetes Institute
NERVE GROWTH FACTOR PROMOTES CARDIAC REGENERATION IN A CARDIOTOXIC MODEL OF HEART FAILURE IN ZEBRAFISH
Lam NT, Marshall T, Khammy O, Currie PD, Rosenthal N, Kaye DM

Baker IDI Heart and Diabetes Institute Prize for Diabetes Research
Felicia Yap  Baker IDI Heart and Diabetes Institute
ACE ADVANCED GLYCATION END PRODUCTS ARE DIRECT MODULATORS OF PANCREATIC ISLET INSULIN SECRETORY FUNCTION

Burnet Prize for Infectious Diseases Research and International Health (First Prize)
Mark Stoové  Burnet Institute
INCIDENCE AND TRANSMISSION RISKS FOR HIV, SYPHILIS AND CHLAMYDIA IN MEN WHO HAVE SEX WITH MEN: FINDINGS FROM A PRIMARY CARE SENTINEL SURVEILLANCE NETWORK IN VICTORIA, AUSTRALIA

Burnet Prize for Infectious Diseases Research and International Health (Second Prize)
Alyssa Barry  Burnet Institute
PROFILING PATTERNS OF ANTIBODY ACQUISITION TO DIVERSE PLASMODIUM FALCIPARUM ERYTHROCYTE MEMBRANE PROTEIN 1 (PFEMP1) VARIANTS USING PROTEIN MICROARRAYS

Burnet Prize for Infectious Diseases Research and International Health (Third Prize)
Devy Santoso  Burnet Institute
MEMORY B CELL, T CELL IFN-γ AND IL-2 RESPONSES TO PANDEMIC H1N1 INFLUENZA IN A LONGITUDINAL COHORT STUDY

Whole Time Medical Specialists Private Practice Scheme Prizes for Clinical Research
Amanda Thrift  Baker IDI Heart and Diabetes Institute
GENDER SPECIFIC EFFECTS OF CASTE AND SALT ON HYPERTENSION IN POVERTY: A POPULATION-BASED STUDY
Thrift AG, Evans RG, Kalyanram K, Kartik K, Fitzgerald SM, Srikanth V

Yuanyuan Wang  Department of Epidemiology and Preventive Medicine, Monash University
PATELLOFEMORAL AND TIBIOFEMORAL CHANGES IN ARTICULAR CARTILAGE AND SUBCHONDRAL BONE FOLLOWING ARTHROSCOPIC PARTIAL MEDIAL MENISCECTOMY

Senior Medical Staff Prize for Clinical Research
Lester Bisibisera  Burnet Institute
IMPROVING IMMUNISATION AND NEWBORN SURVIVAL AT THE AID POST LEVEL IN PAPUA NEW GUINEA
Bisibisera L, Winjong H, Bauze A, Morgan C

Senior Medical Staff Prize for Basic Science/Laboratory-based Research
Maithili Sashindranath  Australian Centre for Blood Diseases, Monash University
INCREASED PERMEABILITY OF THE BLOOD-BRAIN BARRIER AND MORE SEVERE MOTOR IMPAIRMENT FOLLOWING TRAUMATIC BRAIN INJURY IN MICE OVER-EXPRESSING TISSUE TYPE PLASMINOGEN ACTIVATOR (TPA)
Sashindranath M, Sales E, Karadimos D, Beckham S, Gall A, Medcalf R
Listed are the major national competitive, peer-reviewed research grants held by AMREP staff in 2010; inclusion is based on the Australian Competitive Grants Register (ACGR). Major international grants are also listed.

**Australian Grants**

**Cooperative Research Centres (CRC) Program**


**National Health and Medical Research Council Grants**


**Capacity Building Grants**

- Eades S. Making a difference: building research capacity for health interventions to improve Aboriginal health. 2010-2011: $2,317,125. Administering institution: Baker IDI.

**Centre of Clinical Research Excellence**


**Centres of Research Excellence**


**H1N1 Influenza Research Grant**


**Health Services Research Grants**


Medical Bioinformatics, Genomics and Proteomics Strategic Grant

Palliative Care Research Grant

Preventive Healthcare and Strengthening Australia’s Social and Economic Fabric Research Grants

Development Grants


Enabling Grants


Project Grants


Bobik A, Peter K, Agrotis A. HMGB1, a cytokine linking inflammation, lipid accumulation, and platelet activation in atherosclerosis. 2008-2010: $498,750. Administering institution: Baker IDI.


Bruce C. Sphingosine kinase as a target therapeutic for obesity induced insulin resistance. 2009-2011: $432,750. Administering institution: Baker IDI.


Coughlan M. Restricting dietary advanced glycation end product intake as a potential therapeutic tool in diabetic nephropathy. 2010-2012: $466,125. Administering institution: Baker IDI.


Gugasyan R, Berzins S. NFkB1 is a novel regulator of CD8+ T cell development and memory cell generation. 2010-2012: $422,400. Administering institution: Burnet Institute.


Hannan R, Woodcock E, Thomas W. Regulation of cardiac hypertrophy at level of ribosome biogenesis. 2008-2010: $609,000. Administering institution: University of Melbourne.


Hughan S, Nesbitt W. Investigation of Dok2 and Dok1 adapter proteins in the negative regulation of integrin αIIbβ3 platelet signalling. 2008-2010: $437,615. Administering institution: Monash University.


Medcalf R, Lawrence D. To determine the means by which plasminogen activators modulate integrity of the blood brain barrier. 2010-2012: $504,500. Administering institution: Monash University.


Peter K. CD40L/Mac-1 as therapeutic target in inflammatory diseases in particular atherosclerosis. 2010-2012: $539,500. Administering institution: Baker IDI.


Peter K, Bobik A. Monomeric C-reactive protein as pathogenic factor and therapeutic target in atherothrombotic disease. 2008-2010: $647,625. Administering institution: Baker IDI.


Scott AM, Ramsland PA, Ravetch JV. Using the immune system to treat cancers. 2009-2011: $543,500. Administering institution: La Trobe University.


Sviridov D, Thomas M, Bach L. Impact of advanced glycation on anti-atherogenic properties of high density lipoprotein. 2009-2011: $357,750. Administering institution: Baker IDI.


Australia Fellowships
Cooper M. 2009-2013. Administering institution: Baker IDI.

Research Fellowships
Dart A. 2010-2014. Administering institution: Baker IDI.
El-Osta A. 2009-2013. Administering institution: Baker IDI.
Esler M. 2010-2014. Administering institution: Baker IDI.
Head G. 2006-2010. Administering institution: Baker IDI.
Kaye D. 2008-2012. Administering institution: Baker IDI.
Little P. 2006-2010. Administering institution: Baker IDI.
Meikle P. 2008-2012. Administering institution: Baker IDI.
Schaich M. 2010-2014. Administering institution: Baker IDI.
Shaw J. 2010-2014. Administering institution: Baker IDI.
Stewart S. 2008-2012. Administering institution: Baker IDI.
Svirodov D. 2010-2014. Administering institution: Baker IDI.
Thomas M. 2010-2014. Administering institution: Baker IDI.
Woodcock E. 2010-2014. Administering institution: Baker IDI.

Practitioner Fellowships

Industry Fellowship

Career Development Awards
Bruce C. 2010-2013. Administering institution: Baker IDI.
Forbes J. 2010-2013. Administering institution: Baker IDI.
Jowett J. 2010-2013. Administering institution: Baker IDI.

Training (Postdoctoral) Fellowships
Fu Y. 2010-2011. Administering institution: Baker IDI.
Inglis S. 2008-2010. Administering institution: Baker IDI.
Lynch B. 2010-2013. Administering institution: Baker IDI.
McNamara B. 2010-2013. Administering institution: Baker IDI.
Medley TL. 2005-2010. Administering institution: Baker IDI.

Other Australian Grants
ANZ Trustees – Mason and Williams Memorial Foundation Research Grants
Davis S, Bell R. Does transdermal testosterone therapy significantly improve cognitive performance in postmenopausal women? A randomised placebo controlled trial over 26 weeks. 2009-2010: $70,000. Administering institution: Monash University.

Arthritis Australia – Fellowships

AusAID – Australian Leadership Award Fellowship
AusAID – Bilateral Program Grants


Toole M. Tingim Laip project, Papua New Guinea. 2007-2010: $10,000,000. Administering institution: Burnet Institute.

AusAID – Development Research Awards


AusAID – NGO Cooperation Program Innovations Fund

AusAID – NGO Project Grants


Australia and New Zealand Burns Association – Project Grant

Australian Centre for HIV and Hepatitis Virology – Project Grant

Australian Diabetes Society – Early Career Fellowship

Australian Government National Water Commission – Research Fellowship

Australian Research Council – Discovery Grants


Australian Research Council – Future Fellowships

Australian Centre for HIV and Hepatitis Virology – Project Grant

Australian Diabetes Society – Early Career Fellowship

Australian Government National Water Commission – Research Fellowship

Australian Research Council – Discovery Grants


Australian Research Council – Future Fellowships

Dunstan D. 2010-2014. Administering institution: Baker IDI.


Australian Research Council – Linkage Grants


Australian Research Council – Linkage Grants


Australian Research Council – Linkage Grants


**Australia Stem Cell Centre – Program Grant**

**Beyondblue Victorian Centre of Excellence in Depression and Related Disorders – Research Grant**

**Bupa Health Foundation (formerly MBF Foundation) – Project Grants**


**Cancer Australia – Priority-driven Collaborative Cancer Research Scheme Grant**

**Cancer Council Victoria – Grants-in-Aid**


**Cardiac Society of Australia and New Zealand – World Congress of Cardiology/CSANZ Research Investigatorship**
Kistler PM. Comparison of catheter ablation with medical therapy for atrial fibrillation in heart failure. 2007-2010. Administering institution: Baker IDI.

**Cass Foundation – Science and Medicine Grants**


Williams DR. Establishing the role of serotonergic neurons in dyskinesias in Parkinson’s disease. 2010: $40,000. Administering institution: Monash University.

**CSIRO – Flagship Cluster**

**Department of Health and Ageing (Federal Government)**


**Department of Human Services (Victorian Government)**


Williams DR. Establishing the role of serotonergic neurons in dyskinesias in Parkinson’s disease. 2010: $40,000. Administering institution: Monash University.


**Department of Innovation, Industry, Science and Research (Victorian Government) – International Science Linkages Competitive Grant**
Diabetes Australia Research Trust – Type 1 Millennium Award

Diabetes Australia Research Trust – Type 2 Millennium Award

Dairy Innovation Australia – Research Services Grant

Ilhan Food Allergy Foundation – Research Grant

Juvenile Diabetes Research Foundation (Australia) – Research Grant
Slattery R. The role of the human insulin promoter in regulating beta cell autoimmunity. 2007-2010: $495,000. Administering institution: Monash University.

Kidney Health Australia – Bootle Grant
Thomas M. Novel diabetes research – to explore a link between insulin and the complications it causes. 2006-2010: $1,000,000. Administering institution: Baker IDI.

L.E.W. Carty Charitable Fund – Research Grant

National Heart Foundation of Australia – Career Development Fellowship

National Heart Foundation of Australia – Grants-in-Aid

El-Osta A, Thomas M, Tikellis C. Understanding glucose induced gene regulatory events associated with hyperglycemic memory in endothelial cells. 2010-2011: $129,000. Administering institution: Baker IDI.


Mackay F. Rare CXCR7 mutations and cardiac development. 2009-2010: $164,218. Administering institution: Monash University.


National Heart Foundation of Australia – Overseas Research Fellowship
Calkin A. The role of the nuclear receptor NR4A receptors in inflammation, lipid metabolism and atherosclerosis. 2009-2012. Administering institution: Baker IDI.

National Heart Foundation of Australia – Postdoctoral Fellowships


Ta H. Novel contrast nanoparticles for early diagnosis of vascular disease using magnetic resonance imaging, computed tomography and synchrotron-based imaging. 2010-2011. Administering institution: Baker IDI.


Pfizer – Cardiovascular Lipid Research Grants

Pfizer – Senior Research Fellowship
Royal Australasian College of Physicians – Collaborative Research Initiative Grant

Sylvia and Charles Viertel Charitable Foundation – Clinical Research Fellowship

Transport Accident Commission – Grants


Fellows


VicHealth – Fellowships


VicHealth – Translational Cancer Research Grant


Victorian Cancer Agency – Research Grant

Victorian Neurotrauma Initiative – Neurotrauma Fellowships


Victorian Neurotrauma Initiative – Program Grants


Victorian Neurotrauma Initiative – Project Grants


Water Quality Research Australia and Smart Water Fund (Victoria Water Trust) – Research Grant

International Grants

Bill and Melinda Gates Foundation – Grand Challenges in Global Health
Ford Foundation – Asset Building and Community Development Grant

Juvenile Diabetes Research Foundation International – Career Development Award
Tikellis C. ACE2 in the vascular complications of Type 1 diabetes. 2010-2014. Administering institution: Baker IDI.

Juvenile Diabetes Research Foundation International – Multi-project Grants

Juvenile Diabetes Research Foundation International – Project Grants
Forbes J. RAGE as a link between environmental and genetic susceptibility to Type 1 diabetes. 2010: US$110,000. Administering institution: Baker IDI.

Leukaemia and Lymphoma Society (USA) – Specialized Center of Research

Levi Strauss Foundation – Strategic Grant

Muscular Dystrophy Association – Research Grant

National Alliance for Research on Schizophrenia and Depression, USA – Young Investigator Award

National Institutes of Health (USA)

NIH Fogarty International Centre – Millennium Promise Award

Society for Progressive Supranuclear Palsy – Research Grant

Stanley Medical Research Institute (USA)

United Nations Development Program – Fund for HIV/AIDS in Myanmar Grant
MAJOR GRANTS


Lee-Young R. Understanding the metabolic consequences of impaired AMPK$\alpha_2$ and nNOS$\mu$ in skeletal muscle: implications for the metabolic syndrome. $556,706. Administering institution: Baker IDI.


Mackay F, Hertzog P. The role of BAFF, its receptor TACI and toll-like receptors in autoimmunity and tolerance. $470,022. Administering institution: Monash University.


McMullen J. Manipulating cardiac-selective PI3K targets to reverse heart failure progression. $514,615. Administering institution: Baker IDI.


Woodcock E, Kistler P. Phospholipase C$\beta$1b, a target to limit atrial dilatation. $526,299. Administering institution: Baker IDI.

Woodcock E, Grubb D. SHANK3 as a target to reduce hypertrophy and heart failure. $530,048. Administering institution: Baker IDI.

Development Grants


Head G, Kaye D, Byrne M. Development of oral natriuretic peptides for congestive heart failure. $496,410. Administering institution: Baker IDI.

Peter K, Hagemeyer C, Krippner G, Adams T. Development of platelet-targeted nanoparticles for magnetic resonance imaging towards the detection of thrombi/emboli and vulnerable atherosclerotic plaques. $586,996. Administering institution: Baker IDI.
Research Fellowships

Career Development Awards

Training Fellowships
Davern P. Australian Biomedical. 2011-2014. Administering institution: Baker IDI.
Ng T. Australian Biomedical. 2011-2014. Administering institution: Baker IDI.

AMREP HONOURS SCHOLARSHIPS 2011

Jodie Abramovitch
Allergy Laboratory, Department of Immunology, Monash University.
Supervisors: Professor Jennifer Rolland and Professor Robyn O’Hehir.

Elyse Di Marco
Diabetes and Kidney Disease Laboratory, Baker IDI Heart and Diabetes Institute and Diabetes Laboratory, Department of Immunology, Monash University. Supervisors: Professor Karin Jandeleit-Dahm and Associate Professor Robyn Slattery.
PhD


Al-Tamimi M. Platelet receptor shedding – platelet specific collagen receptor glycoprotein VI. Monash University. Anticipated completion: 2011. Department of Immunology, Monash / Australian Centre for Blood Diseases, Monash.


Allen-Graham J. Inhibition of APP and APLP2 to investigate protein function possible therapies for AD. Monash University. Anticipated completion: 2012. Department of Medicine, Monash / Department of Neurology, Alfred.


Andrew N. Epidemiology and outcomes of serious sport and leisure injuries. Monash University. Anticipated completion: 2012. Department of Epidemiology and Preventive Medicine, Monash / National Trauma Research Institute, Alfred.


Bayles R. Examination of the noradrenaline transporter in major depressive disorder: delineating mechanisms of cardiac risk. Deakin University. Anticipated completion: 2011. Department of Cardiovascular Medicine, Alfred / Baker IDI.


Borg R. Investigation into the interaction between tissue-type plasminogen activator and injured cells. Monash University. Anticipated completion: 2012. Australian Centre for Blood Diseases, Monash.


Brennan S. Developing a research framework to improve our ability to understand and measure the effect of continuous quality improvement (CQI) in primary care. Monash University. Anticipated completion: 2011. Department of Epidemiology and Preventive Medicine, Monash / Australasian Cochrane Centre, Monash.


Bull T. Clara cell secretory protein as a biomarker of inadequate repair in lung transplantation. Monash University. Anticipated completion: 2013. Department of Allergy, Immunology and Respiratory Medicine, Alfred / Department of Medicine, Monash.


Butler M. Novel imaging modalities for detection of organ fibrosis. Monash University. Anticipated completion: 2013. Department of Cardiovascular Medicine, Alfred / Department of Medicine, Monash / Baker IDI.


Chan W. Iron and oxidative stress in coronary artery disease. Monash University. Anticipated completion: 2012. Department of Cardiovascular Medicine, Alfred / Department of Medicine, Monash / Baker IDI.

Chang C. Immunopathogenesis and diagnosis of tuberculosis and tuberculosis-associated immune restoration disease in people with HIV. Monash University. Anticipated completion: 2013. Department of Medicine, Monash / Infectious Diseases Unit, Alfred / Burnet.

Chang L. Gene activity patterns associated with the development of pathological cardiac hypertrophy are mediated by specific epigenetic changes. Monash University. Anticipated completion: 2011. Department of Medicine, Monash / Baker IDI.


Chen YCB. Targeting stem cell to the sites of endothelial damage and atherosclerotic lesions. Monash University. Anticipated completion: 2011. Department of Medicine, Monash / Baker IDI.


Christopher M. Dyslipidaemia resulting from obesity or other high-risk states is a major contributor and predictor of the onset and progression of diabetes. Monash University. Anticipated completion: 2014. Department of Medicine, Monash / Baker IDI.


David C. Development of a rotavirus vaccine. University of Melbourne. Department of Immunology, Monash.


Deasy C. Cardiac arrest – addressing the gaps in our scientific knowledge. Monash University. Anticipated completion: 2012. Department of Medicine, Monash / Infectious Diseases Unit, Alfred / Burnet / National Trauma Research Institute, Alfred.


Diug B. How do social risk factors affect warfarin therapy? What are the social responsibilities and strategies in place to deal with these risk factors? Monash University. Anticipated completion: 2012. Department of Epidemiology and Preventive Medicine, Monash.


Evans V. Dendritic cells and their role in HIV-1 pathogenesis. Monash University. Anticipated completion: 2011. Infectious Diseases Unit, Alfred / Department of Medicine, Monash / Burnet.


Fooladi E. The effect of transdermal testosterone on sexual function among SSRI(s) drugs users. Monash University. Anticipated completion: 2014. Department of Medicine, Monash / Department of Epidemiology and Preventive Medicine, Monash / Women's Health Program, Monash.


Goeman D. Improving the quality and content of General Practice consultations for people with asthma. Monash University. Anticipated completion: 2012. Department of Allergy, Immunology and Respiratory Medicine, Alfred / Department of Medicine, Monash.


Gorzin A. The role of the NS2 protein in the hepatitis C virus life cycle. Monash University. Burnet.


Habersberger J. Proinflammatory effects of monomeric C reactive protein in vascular endothelium. Monash University. Anticipated completion: 2014. Department of Medicine, Monash / Department of Cardiovascular Medicine, Alfred / Baker IDI.


Herbert D. The social and ethical dimensions of genetic testing a longitudinal of the haemophilia community. Monash University. Anticipated completion: 2011. Department of Medicine, Monash.


Hodgson C. Recruitment manoeuvres in adult ventilated patients. Monash University; Completed: 2010. Physiotherapy Department, Alfred / Intensive Care Unit, Alfred.


Huynh K. The causal role of ROS induced damage in the development of LV dysfunction in the diabetic heart in vivo. Monash University. Anticipated completion: 2013. Department of Medicine, Monash / Baker IDI.

Iles L. Myocardial fibrosis and heart failure. Monash University. Anticipated completion: 2012. Department of Cardiovascular Medicine, Alfred / Department of Medicine, Monash / Baker IDI.


Keating S. The role of epigenetic chromatin remodelling in the expression of genes relevant to diabetic nephropathy. Monash University. Anticipated completion: 2011. Department of Medicine, Monash / Baker IDI.

Kee K. The effects of heart failure on the lung. Monash University. Anticipated completion: 2012. Department of Allergy, Immunology and Respiratory Medicine, Alfred / Department of Medicine, Monash.

Kelly V. The effects of heterogeneity and airway closure on airway distensibility measurements in asthma. Monash University. Completed: 2010. Department of Allergy, Immunology and Respiratory Medicine, Alfred.


Khoury G. Viral reservoirs: role of naive T-cells in pathogenesis of T-cell decline and long term persistence of HIV infection. Monash University. Anticipated completion: 2012. Department of Medicine, Monash / Infectious Diseases Unit, Alfred / Burnet.

Khurana I. Chromatin immunopurification strategies for the application and standardisation of next generation sequencing. Monash University. Anticipated completion: 2012. Department of Medicine, Monash / Baker IDI.


Kimmel L. Predicting the discharge disposition of orthopaedic trauma patients and analysing the outcomes. Monash University. Anticipated completion: 2018. Department of Physiotherapy, Alfred / Department of Epidemiology and Preventive Medicine, Monash.


Kraakman M. Role of 11-6 in obesity-induced insulin resistance: advantages and therapeutic strategies to overcome these pitfalls. Monash University. Anticipated completion: 2013. Baker IDI.


Lee PSS. Influence of n3:n6 fatty acids ratio on vascular inflammatory profile in patients with hypercholesterolemia. Monash University. Anticipated completion: 2011. Department of Medicine, Monash / Department of Cardiovascular Medicine, Alfred / Baker IDI.


LeMasurier J. The effect of particles on acute allergic airway inflammation. Monash University. Anticipated completion: 2012. Department of Allergy, Immunology and Respiratory Medicine, Alfred / Department of Immunology, Monash.


Li JB. CDA1 modulates TGF-B signalling in vascular diseases. Monash University. Anticipated completion: 2013. Department of Immunology, Monash / Baker IDI.

Lichtfuss G. Quantification of HIV viral fitness and the relationship to treatment outcomes. Monash University. Anticipated completion: 2012. Department of Medicine, Monash / Infectious Diseases Unit, Alfred / Burnet.


Lindsay E. Cerebellar disease: exploring the application, reliability and validity of a diagnostic instrument for quantifying ataxia of the upper limbs. Monash University. Anticipated completion: 2018. Department of Medicine, Monash.


Lunke S. Epigenetic regulation of the human survival of motor neuron gene in spinal muscular atrophy. Monash University. Anticipated completion: 2011. Department of Medicine, Monash / Baker IDI.


McMahon J. Social, behavioural and clinical factors associated with poor outcomes in patients living with HIV on antiretroviral therapy. Monash University. Anticipated completion: 2012. Infectious Diseases Unit, Alfred / Department of Medicine, Monash.


Meehan A. Investigating the function of natural killer cells during immunological responses following lung transplantation. Monash University. Anticipated completion: 2014. Department of Allergy, Immunology and Respiratory Medicine, Alfred / Department of Medicine, Monash.


Mohamud R. The effects of nanoparticles on regulatory T cells in lungs: implication for asthma developments and immunotherapy. Monash University. Anticipated completion: 2012. Department of Immunology, Monash / Department of Allergy, Immunology and Respiratory Medicine, Alfred.


Nair A. Antifungal drugs can affect the immune function of T, natural killer and dendritic cells. Monash University. Anticipated completion: 2013. Australian Centre for Blood Disease, Monash / Baker IDI.


Neoh C. Optimising the use of high-cost antifungal agents in Australian hospitals. Monash University. Anticipated completion: 2012. Department of Allergy, Immunology and Respiratory Medicine, Alfred.


Ooi J. Epigenetic modification and the role of chromatin modifying determinants in the hypertrophied heart. Monash University. Anticipated completion: 2011. Department of Medicine, Monash / Baker IDI.
O’Reilly G. International Trauma Epidemiology: paths and challenges to the establishment of trauma registries in developing (and developed) countries. Monash University. Anticipated completion: 2016. *Emergency Medicine, Alfred / Department of Epidemiology and Preventive Medicine, Monash / National Trauma Research Institute, Alfred.*


Osadnik C. Airway clearance techniques for chronic obstructive pulmonary disease. La Trobe University. Anticipated completion: 2012. *Physiotherapy Department, Alfred.*


Park A. Assessment of biodegradable nanoparticles as candidates for cancer vaccine therapies and the molecular pathways by which these nanoparticles activate the immune system. Monash University. Anticipated completion: 2014. *Department of Immunology, Monash.*


Pretorius L. Beneficial role of genes activated in the athlete’s heart in a setting of heart failure: role of PISK (p110) and exercise. Monash University. Completed: 2010. *Department of Medicine, Monash / Baker IDI.*


Quinn B. The Un-MET Study: understanding the barriers to health service and treatment utilisation for methamphetamine users. Monash University. *Burnet.*

Rahefi H. University of Melbourne. Anticipated completion: 2013. *Baker IDI.*

Rajasuriar R. Biological determinants of immune reconstitution. Monash University. Anticipated completion: 2011. *Infectious Diseases Unit, Alfred / Department of Medicine, Monash / Burnet.*


Sanagou M. Preoperative hierarchical risk prediction modelling for 30 day mortality following cardiac surgery in Australia. Monash University. Anticipated completion: 2013. *Department of Epidemiology and Preventive Medicine, Monash.*


Semple B. Chemokines in secondary tissue damage following traumatic brain injury. Monash University. Completed: 2010. *Department of Medicine, Monash / National Trauma Research Institute, Alfred.*


Smith B. Novel approaches for the diagnosis and management of atherosclerosis. Monash University. Anticipated completion: 2012. *Department of Medicine, Monash / Department of Cardiovascular Medicine, Alfred / Baker IDI.*

Socratous F. Sympathetic activation in chronic renal disease: role of the novel soluble monoamine oxidase 'renalase'. Monash University. Anticipated completion: 2012. Department of Medicine, Monash / Baker IDI.


Stub D. Improving prognosis in out of hospital cardiac arrest utilising circulatory support. Monash University. Anticipated completion: 2014. Department of Medicine, Monash / Department of Cardiovascular Medicine, Alfred / Intensive Care Unit, Alfred / Baker IDI.


Szollosi I. Characteristics of sleep disordered breathing in heart failure. Monash University. Completed: 2010. Department of Allergy, Immunology and Respiratory Medicine, Alfred / Department of Medicine, Monash.


Wright E. Neuropathogenesis of HIV dementia. Monash University. Anticipated completion: 2011. Infectious Diseases Unit, Alfred / Department of Medicine, Monash / Burnet.

Wrobel J. Pulmonary mechanics and pulmonary hypertension in severe COPD. Monash University. Anticipated completion: 2014. Department of Medicine, Monash / Department of Allergy, Immunology and Respiratory Medicine, Alfred.


Yap FYT. The contribution of AGEs and their receptors to beta cell dysfunction. Monash University. Anticipated completion: 2013. Department of Immunology, Monash / Baker IDI.

Yap SH. Role of mutations in the connection domain of the HIV reverse transcriptase in drug resistance. Monash University. Burnet.

Yong M. Cytomegalovirus infection post transplantation. Monash University. Anticipated completion: 2014. Infectious Diseases Unit, Alfred / Department of Medicine, Monash.


Zardo P. Application of research evidence in Australian health policy: how to build support and capacity for evidence based decision making. Monash University. Anticipated completion: 2014. Department of Epidemiology and Preventive Medicine, Monash / National Trauma Research Institute, Alfred.


Other Doctorates


Hackman K. Risk factors for diabetes after lung transplantation: focus on CMV infection. Doctor of Medicine, Monash University. Anticipated completion: 2012. Department of Medicine, Monash / Department of Endocrinology and Diabetes, Alfred / Department of Allergy, Immunology and Respiratory Medicine, Alfred.


Leet A. Myocardial fibrosis and function after heart transplantation. Doctor of Medicine, Monash University. Anticipated completion: 2014. Department of Medicine, Monash / Department of Cardiovascular Medicine, Alfred.


Braun LA. CMs are safe, say your customers. *Aust J Pharm* 2010;91(1081):52-3. Review.


Davis SR. Should women receive androgen replacement therapy, and if so, how? Cln Endocrinol 2010;72(2):149-54. Comment.


Dev S, Kuligowski MP, Kwan RY, Westein E, Jackson SP, Kitching AR, Hickey MJ. Platelet recruitment to the inflamed glomerulus occurs via an α(3)β(1)/GPVI-dependent pathway. Am J Pathol 2010;177(3):1131-42.


Dharmarajah J, Arthur JF, Sobey CG, Drummond GR. The anti-platelet effects of apocynin in mice are not mediated by inhibition of NADPH oxidase activity. Naunyn Schmiedebergs Arch Pharmacol 2010;382(4):377-84.


Engel DC, Mikocka-Walus A, Cameron PA, Maegelie M. Pre-hospital and in-hospital parameters and outcomes in patients with traumatic brain injury: a comparison between German and Australian trauma registries. *Injury* 2010;41(7):837-42.


Staples MP, March L, Lassere M, Reid C, Buchbinder R. Health-related quality of life and continuation rate on first-line anti-tumour necrosis factor therapy among rheumatoid arthritis patients from the Australian Rheumatology Association Database. Rheumatology 2010;50(1):166-75.


Stasinopoulos S, Mariasgaram M, Gafforini C, Nagamine Y, Medcaif RL. The plasminogen activator inhibitor 2 transcript is destabilized via a multi-component 3′ UTR localized adenylation and uridylate-rich instability element in an analogous manner to cytokines and oncopogenes. FEBS J 2010;277(5):1331-44.


**Szmulewicz DJ, Faragher MW. Weak at the knees. J Clin Neurosci** 2010;17(10):1304.


Tonkin AM, Chen L. Effects of combination lipid therapy in the management of patients with Type 2 diabetes mellitus in the Action to Control Cardiovascular Risk in Diabetes (ACCORD) trial. Circulation 2010;122(8):850-2.


Wilkinson-Berka JL, Miller AG, Fletcher EL. Prorenin and the (pro)renin receptor: do they have a pathogenic role in the retina? Front Biosci 2010;2:1054-64. Review.


Wood C, Harkess M, Grif.


**Commissioned Reports**


**Books**


**Book Chapters**


