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Epworth research is soaring high.

Ten years ago very little research was conducted by Epworth. Today we have more than 150 clinical researchers who are ‘research active’, as measured by research publications in refereed journals over the last three years, applications to Epworth’s Human Research Ethics Committee and awarding of research funding to support their research.

There are currently over 250 research projects underway at Epworth, with a culture of collaboration, teamwork, facilities and resources ensuring the research conducted is of the highest calibre. Research publications increased by 10% during the year, exceeding all Australian private healthcare organisations – with papers in quality journals such as British Medical Journal, Cell, European Urology, Nature Communications and New England Journal of Medicine.

In terms of key research appointments, we were pleased to welcome Prof Paul Fitzgerald as Professor Director of Psychiatry and Prof Nik Zeps as the Group Director of Research and Development. This brings the contingent of Professors supported by Epworth to 20. Twenty Epworth clinicians were also awarded honorary university appointments during the year.

The Genomics Molecular Oncology Research Unit was established under the leadership of Prof Miles Prince who was inducted as a Fellow of the Australian Academy of Health and Medical Sciences. In the Australia Day Honours Prof Mari Botti was awarded AM and Epworth 2016 Research Leader of the Year. Prof Jenny Ponsford was awarded AO and Epworth 2017 Research Leader of the Year.

Epworth’s clinical research network includes eleven speciality Clinical Institutes which auspice 15 Clinical Quality Registries. These registries offer a rich source of robust, consistently collected and stored data to research and evaluate treatments and clinical practices and identify where improvements are required. In 2016–17 two new Clinical Quality Registries were implemented: Breast Device and Neuromodulation and three new medical audit systems were introduced.

The Epworth Research Institute was established in 2009 to facilitate and foster research in major and emerging areas of health care across the Epworth group, ensuring close collaboration with clinical practice. We are continuing to build a corpus of funds to foster research activities at Epworth and support researchers in their early careers. To date this stands at over $13 M which enabled us to award $655,000 in research grants at the annual Epworth Research Week Dinner in 2016.

We have also recently established the Epworth Knowledge Bank, an online digital repository holding all Epworth publications in one location. This is an important initiative to recognise the significant impact our researchers are having in advancing knowledge and improved health care in Australia and around the world. The collection reached the 1000 article threshold during the year.
Epworth’s clinical trials have grown in size and impact – 60 are currently active – and we have developed capacity to undertake ‘First in Man’ Phase 1 trials. Epworth Prostate Centre was refunded to December 2018 and lead investigator Dr Niall Corcoran won the Epworth 2017 Researcher of the Year.

Two Epworth Research weeks were held successfully in July 2016 and June 2017 including keynote speeches by distinguished researchers Prof Anne Kelso AO and Prof Ian Frazer AC. There was a 22% increase in medical school student placements from Deakin University, Monash University and the University of Melbourne (UoM), and which will enable more student research projects to be undertaken. Epworth UoM Clinical School also doubled in size with MD2 and MD3 programmes.

Epworth is committed to national and international collaborative research partnerships across both the public and private health sector. Epworth is a founding partner of Monash Partners, which has been recognised by NHMRC as an Advanced Health Research and Translation Centre, one of only four entities nationally. In 2016–17 Monash Partners received $2m from the NHMRC. New US collaborations were also established with the Mayo Clinic and Northwell Health.

I should like to record my appreciation to all those who have made this phenomenal growth and development possible. To our patients, friends, benefactors, industry, grant bodies, Epworth Board, executives, doctors, staff, partners, students and researchers – a very big Thank You and Well Done!

Professor John Catford
Executive Director Academic and Medical
Epworth Healthcare has a long tradition of health and medical research and it is my honour to have been appointed as the inaugural Group Director of Research and Development. It is an exciting time to be engaged in research with an ever increasing range of innovations being produced by both the academic and the commercial sector.

In this report we provide an overview of the various clinical areas that are actively involved in health and medical research across Epworth. Many of the research programs span more than one discipline and cut across a range of health conditions in line with the manner in which we deliver healthcare today. That is, it takes a range of skills and effective teamwork to ensure that our patients, their families and our community receive the best possible care and therefore experience the most optimal outcomes that are possible. All of the projects involve collaboration with external partners from universities, medical research Institutes and with industry. In addition, we are increasingly engaging with consumers in all our projects and several of the feature pieces here provide details of how we are working closely with our patients and community to improve their lives.

Over the next 12 months we are embarking on the development of a research strategy for 2019–2021 that will align with the broader Epworth HealthCare Strategic Plan. We are fortunate that Epworth sees research as being of central importance and look forward to creating a culture where research informs every clinical decision and is used to evaluate outcomes to make sure that patients and their families receive the very best care.

Nikolajs Zeps
Group Director of Research and Development

We are EPWORTH
Year at a glance

150
Active researchers

250
Research projects underway

60
Active clinical trials in 2016/17

10%
Increase in research publications. Totaling more than any other private healthcare organisation

150

~$400,000
15 Epworth research grants awarded, valued at a total of up to $400,000

RESEARCH PUBLICATIONS
The ever increasing number of publications in peer-reviewed, international journals, books and book chapters is reflective of the growing research capacity and capability at Epworth.

Now undertaking ‘first in man’ Phase 1 trials

<table>
<thead>
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<th>Year</th>
<th>Publications</th>
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<td>2015/16</td>
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Epworth Research Development Unit

Overview

All research projects are required to ensure that they are planned and conducted such that participants will be kept safe, that all ethical requirements are met and that they will be successful in reaching their goals. Broadly, the term “Research Governance” has been applied to the processes that institutions, regulators, sponsors and investigators use to deliver safe and effective health and medical research that involves humans.

Institutions have a responsibility to ensure that they comply with all legal and ethical regulations but also must ensure that staff involved in the conduct of the research are appropriately qualified and experienced, have sufficient resources to conduct the research, that patients are available, that their care will not be compromised by participation and that appropriate safety monitoring is in place. In addition, all institutions must determine whether the proposed studies align with their values and strategic intent.

At Epworth we have taken the approach that the best way to ensure compliance is to assist those doing the work to understand their obligations and to assist them to meet community expectations. Rather than creating a bureaucratic hurdle to research we have established the Epworth Research Development Unit (RDU) and the staff employed therein are there to help researchers, both internal and external, to navigate the requirements.

Research Development Officers

Victoria McMorran

Biostatistical support

Dr Dean Mckenzie
Dr Stella Goodwini
Dr Michael Fahey
Maintaining Ethical Standards

All research conducted at Epworth must be approved by a Human Research Ethics Committee (HREC) that is aligned with the National Statement on Ethical Conduct in Human Research (2007). Epworth’s own Human Research Ethics Committee (HREC) reviewed a total of 88 ethics applications in 2016/2017 with 49 being judged as Low or Negligible risk research projects.

Epworth would like to thank the members of HREC for their continued dedication to serving on our HREC and in particular the Reverend Professor Emeritus Christiaan Mostert (Chair, HREC) and Professor Mari Botti (Chair, Low-Risk Subcommittee).

Staff
Helen Christiansen
Kyle Heffernan (Maternity leave for HC)
Kerrie Lawrence

HREC COMMITTEE:
Reverend Professor Emeritus Christiaan Mostert (Chair)
Professor Mari Botti AM
Professor Peter Brooks AM
Professor Emeritus John Catford
Professor Jane Fisher
Ms Sarah Pollock
Mr Ian Unwin
The Honourable Peter Young
Ms Marissa Stevens (stepped down in 2015/16)
Dr Ken Khamly (joined in 2015/16)
Dr Gershon Spitz (joined in 2015/16)
Reverend Tom Rose (joined in 2015/16)

LOW RISK SUBCOMMITTEE:
Professor Mari Botti AM (Chair)
Reverend Professor Emeritus Christiaan Mostert
Dr Karin Hammarberg
Ms Tess Lye
Epworth Medical Foundation (EMF) opened in 1982; raising much-needed funds to ensure patients at Epworth HealthCare receive the best possible care.

As a private, not-for-profit organisation, Epworth relies on the generosity of our donors and benefactors as well as ongoing fundraising activities, to enable us to stay at the forefront of advancements in medicine. A key part of our drive to improve involves Epworth engaging in world-leading research and translating these outcomes into clinical best practice for our patients.

We use donated funds to further ground-breaking medical research projects and trials. Donations help support practical research that gives Epworth patients access to cutting-edge, global discoveries in medical treatments, preventative medicine and even cures for serious diseases and conditions.

More than 80 per cent of all research conducted at Epworth HealthCare is funded through Epworth Medical Foundation.

In 2017, EMF received an incredible level of support for these initiatives.

EMF Research funding highlights for 2017 include:

- Mrs Sue Keable funded the establishment of Professor Paul Fitzgerald’s psychiatry research Program;
- Partnership with Snowdome Foundation to support Professor Miles Prince’s molecular oncology research into blood cancers;
- Perpetual Trustees – an Impact Grant to support Professor Miles Prince’s molecular oncology research into blood cancers;
- Meydan Family Charitable Foundation funded the establishment of the Epworth Intensive Care Research Program;
- E.J. Whitten Foundation supported prostate cancer research;
- Phyllis Connor Memorial Trust to support Professor Miles Prince’s molecular oncology research into blood cancers;
- Mr Hal Myers commitment of ongoing support to fund dedicated staff for Professor Paul Fitzgerald Psychiatry Research Program;
- And in recognition of the importance that our donors place on research, in 2017 EMF had two research appeals going out to over 20,000 donors, which raised over $500,000.

More detail on the contribution of our generous donors and benefactors can be found in the 2017 Epworth Medical Foundation Philanthropy Report, via the Epworth website.
The Epworth Research Institute (ERI) hosts a successful research week each year, to discover, enjoy and celebrate the wide variety of research activities currently underway at Epworth HealthCare and in partnership with many of its academic and research partners.

Epworth HealthCare continues to drive excellence in clinical research programs by promoting and supporting investigator-initiated and commercially-sponsored research, strengthening existing research collaborations and developing national and international industry associations and government relations.

Why research matters

Epworth hosts an annual Research Week, to celebrate the incredible research taking place across the organisation. From 5–9 June, a comprehensive program of events was held, including a poster viewing session, a research Grand Round, symposia on a range of topics presented by Epworth clinicians, and the highlight of the week — the Epworth Research Institute Dinner, held at the MCG and featuring keynote speaker Professor Ian Frazer, Chair of the Translational Research Institute Foundation Board.

“Research is fundamental to effective and excellent health service delivery,” says Epworth Group Director of Research and Development, Professor Nikolajs Zeps. “It generates evidence that improves the care for our patients, resulting in better treatments and an enhanced recovery.”

So where does research lead in a practical, tangible sense?

“Research is in essence a methodology that allows you to collect data on, for example, whether or not to use one type of painkiller over another during postoperative recovery. For instance, for a patient who’s had, say, a hip replacement, you want to know whether it’s going to be safe, whether it’s going to give them sufficient pain relief, whether it’s going to assist them with their recovery. We want to learn things about the drug — whether it has side effects — for instance some of these drugs affect how well you can eat and whether you can drive, and some may have a real impact if they have elements of addiction. So research allows us to investigate all of those issues and make sure our patients are ultimately receiving the best treatment. It allows us to test which treatments are best and also to find out whether new treatments are safe and useful.”

Research Week gives Epworth staff a chance to consider embarking on their own research adventures. “It’s an opportunity for those attending to think about things that they’d like to be engaged in. If they have ideas, they should never be afraid of presenting them to their colleagues and have discussions about how we can improve care at every level.

“Research is part of the ethos of Epworth, it’s a part of our values and mission — to ensure that clinical care is truly excellent. Research Week exhibited a variety of projects which exemplify exactly how Epworth is committed to that.”
Research Week award winners

The Epworth Research Institute grant and poster winners were announced during the Research Institute Dinner, on Thursday 8 June.

Three ERI Research Excellence Awards were presented to the following:

**RESEARCHER OF THE YEAR**
Dr Niall Corcoran, Urologist – Epworth Prostate Centre

**RESEARCH OFFICER OF THE YEAR**
Felicity Osmond, Research Nurse – Epworth Clinical Trials Unit

**RESEARCH LEADER OF THE YEAR:**
Professor Jennie Ponsford AO, Chair of Psychology – Epworth Monash Rehabilitation Research Centre
Also awarded on the night were four feasibility grants, nine development grants, one strategic grant, one gynaecological cancer grant and four poster awards. All research grants awarded on the night are supported with funding from our generous donors and benefactors, via the Epworth Medical Foundation. Recipients are as follows:

Dr Murray Johns, Sleep Specialist feasibility grant:
Rebecca Ewers – Clinical Nurse Specialist, Intensive Care Unit Epworth Richmond
A prospective, single centre, cohort study to determine the prevalence, treatment and outcome of delirium in Epworth Richmond Intensive Care Unit.

Mr Arthur Day AM, Gynaecologist feasibility grant:
Dr Pamela Ross – Senior Occupational Therapist, Epworth Richmond
An investigation into factors that contribute to successful return to work after traumatic brain injury

Mr Kingsley Mills, Orthopaedic Surgeon feasibility grant:
Dr Paul Smith – Lead Radiologist, Epworth Medical Imaging Geelong
Magnetic Resonance Imaging of Ligaments and Tendons Using Diffusion Tensor Imaging.

Professor Priscilla Kincaid-Smith, Nephrologist development grant:
Steven McConchie – Group Manager, Clinical Institutes and Medical Audit
Using Data Science to Facilitate the Delivery of Value-based Care.

Associate Professor Jack Mackay, Colorectal Surgeon development grant:
Dr Nicole Tan – VMO Anaesthetist, Epworth Richmond, Eastern and Hawthorn
Does stage of hormonal cycle affect postoperative quality of recovery in premenopausal women?

Mr Campbell Penfold, Colorectal Surgeon development grant:
Mr James Lee – VMO General and Endocrine Surgeon, Epworth Richmond
Performance of Next Generation Sequencing Mutation Panels in Thyroid Nodule Fine Needle Aspiration Samples.

Associate Professor Joe Tjandra, Colorectal Surgeon development grant:
Annie Curtin – Critical Care Registered Nurse, Epworth Richmond
Improving clinical staff engagement in quality improvement activities.

Professor Jack Cade AM, Intensivist development grant:
Bianca Fedele – Research Assistant, Epworth Monash Rehabilitation Medicine Unit, Epworth Richmond and Hawthorn
Dr Graeme Sloman AM, Cardiologist strategic grant: Professor John Olver – Victor Smorgon Professor of Rehabilitation Medicine and Medical Director of Rehabilitation, Epworth Richmond and Hawthorn
Development of a Concussion Protocol, Symptom Checklist and Intervention Program for Directing Patients through a Continuum of Care

Audrey Voss gynaecological cancer grant: Dr Sumitra Ananda – Medical Oncologist VMO, Epworth Freemasons and Richmond
Circulating Tumour DNA as a Marker of Residual Disease and Response to Adjuvant Chemotherapy in Stage I–III Optimally Debulked Epithelial Ovarian, Fallopian Tube and Primary Peritoneal Cancer.

Novice Researcher Poster Award: Olivia Leary (to be accepted by Ron Dick)
Clinical Outcomes of Transcatheter Aortic Valve Implantation in Nonagenarians.

Experienced Researcher Poster Award: Dr Jane Fitzpatrick
The Effectiveness of Platelet-Rich Plasma Injections in Gluteal Tendonopathy – A Randomised, Double-Blind Controlled Trial comparing a single Platelet-Rich Plasma injection with a single corticosteroid injection.

Allied Health Research Poster Award: Adam McKay (to be accepted by Professor Jennie Ponsford)
Agitation during post traumatic amnesia: Characteristics, predictors and impact on therapy

Nursing Research Poster Award: Mietta Dudley (to be accepted by Assoc. Prof Ana Hutchinson)
Exploring the influences of different models of undergraduate nursing education on the work readiness of new graduate nurses.
Anaesthesia and Perioperative Medicine Research Unit

Strategic vision

The Anaesthesia and Perioperative Medicine Research Unit (APM) will facilitate and conduct research, which translates into improved quality and safety in anaesthesia and perioperative care for Epworth HealthCare patients.

Overview

APM (Anaesthesia and Perioperative Medicine) operates across six divisions: Epworth Richmond, Epworth Eastern, Epworth Freemasons, Epworth Hawthorn, Epworth Cliveden and Epworth Geelong. It is responsible for the care of over 80,000 patients per year in 54 operating theatres. All surgical services are provided except for transplant surgery. Epworth Richmond has about 43% of overall activity, Epworth Eastern 26%, Epworth Freemasons 26%, with the remainder at Epworth Hawthorn, Epworth Cliveden and Epworth Geelong. The major surgical specialities by case load include general surgery, orthopaedics, gynaecology and urology. Other key specialities include thoracic surgery, cardiac surgery, obstetrics, vascular surgery, neurosurgery, ENT, paediatric surgery.

At an organisational level APM sits within the Critical Care Clinical Institute, constituted by APM, Intensive Care and Emergency Medicine. The institute is directed by Dr Stephen Warrillow (ICU), with deputy directors Dr Simon Reilly [APM] and Dr Bill Nimo [ED].

Governance

The APM Research Unit has a Strategic Steering Group comprised of:

- Director of APM Research
- Research Unit Manager
- Director of APM or equivalent
- Nurse Unit Manager
- Other (as required)

The Strategic Steering Group is responsible for managing all aspects of the unit’s activity including finances, research program, strategic development, collaborations and outputs. The Epworth Research Development Unit resources are available to support all these activities. Reporting lines will follow established Epworth governance structures as well as being closely aligned to the operational structure of the Research Development Unit.

Capabilities

Current projects are based at Richmond, with possible expansion to Eastern and Freemasons divisions as resources allow. Consideration for participation is based on scientific merit, site feasibility, NHMRC ethical and governance standards, and alignment with Epworth HealthCare’s strategic plan.
Clinical trials

Conception, design, conduct and management of clinical trials is a key capability. This may be via instigation and/or collaboration with internal or external investigators, the Australia and New Zealand College of Anaesthetists Clinical Trials Network (ANZCA CTN), professorial university departments or other groups. Participation in industry-sponsored trials is conducted on a study-by-study basis.

Investigator-initiated studies

LIA: A randomised, double-blind clinical trial to determine the efficacy of local infiltration analgesia for anterior total hip replacement.
Dr N Tan¹, Mr J Hunt¹, Assoc. Prof Barrington²
(single site internal study) Current

ANZCA CTN Studies

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<tr>
<th>Trial</th>
<th>Investigators/Collaborators</th>
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<tr>
<td>PADDI: The Perioperative ADministration of Dexamethasone and Infection – The PADDI trial.</td>
<td>Profs Corcoran⁵, Myles³, Chan⁴, Leslie², Short¹, Forbes³, Story²</td>
<td>Current</td>
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<tr>
<td>RELIEF: REstrictive versus LibEral Fluid TTherapy in Major Abdominal Surgery</td>
<td>Profs Myles³, Bellomo², Davies⁴, Corcoran⁵, Peyton², Story², Leslie⁶, Christofi², Serpell³, Forbes³</td>
<td>Near completion</td>
</tr>
<tr>
<td>BALANCED: The Influence of Anaesthetic Depth on Patient Outcome after Major Surgery</td>
<td>Profs Short¹, Leslie², Chan⁴, Myles³, Frampton⁷</td>
<td>Near completion</td>
</tr>
<tr>
<td>PADDI Genomics: An investigation into the genomics of the inflammatory response to surgery and the actions of dexamethasone</td>
<td>Drs Bain³, Dieleman¹; Prof Corcoran⁵</td>
<td>Planned (2017)</td>
</tr>
<tr>
<td>ROCKet: Reduction of Chronic Post-surgical Pain with Ketamine</td>
<td>Profs Peyton², Leslie², Story², Myles³, Chan⁴, Schug³, Evered²</td>
<td>Planned (2018)</td>
</tr>
<tr>
<td>Advanced Recovery Care: Clinical- and cost-effectiveness of Advanced Recovery Care</td>
<td>Profs Ludbrook³, Maddern⁹, Story²</td>
<td>Potential (2018/19)</td>
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¹Epworth HealthCare, ²University of Melbourne, ³Monash University, ⁴Monash Partners, ⁵University of Western Australia, ⁶Chinese University of Hong Kong, ⁷University of Auckland, ⁸University of Adelaide, ⁹Utrecht University

¹site investigator ¹Dr N Tan
We are EPWORTH
Cardiology and vascular medicine

Cardiac clinical services facilitates and conducts commercial and non-commercial research aimed at providing advanced care for all patients. This translates into improved outcomes for Epworth HealthCare patients.

Key Personnel

Assoc. Prof Ron Dick: Cardiologist and Interventionist
Chairman Cardiac Clinical Services
Assoc. Prof Antony Walton: Cardiologist and Interventionist
Prof. Michael Grigg: Vascular Surgeon
Dr Hendrik Zimmet: Cardiologist and Heart Failure Specialist
Dr Andrei Catanchin: Cardiologist and Electrophysiologist
Mr Peter Chu: Vascular Surgeon
Dr Will Wilson: Cardiologist and Interventionist
Dr William Chan Cardiologist and interventionist
Dr Monique Watts: Cardiologist and Heart Failure Specialist
Mr Adrian Ling: Vascular Surgeon
Mr Marco Larobina: Consultant Cardiothoracic Surgeon
Dr Stephen Duffy: Cardiologist
Dr Dion Stub: Cardiologist and interventionist
Dr Paul Calafiore: Cardiologist
Dr Martin Hiscock: Cardiologist and Interventionist
Jayne Damm: Clinical Research Nurse
Donna McCallum: Clinical Research Nurse
Julie Cook: Clinical Research Nurse

Clinical trials and registries

Galactic-HF
Dr Hendrik Zimmet
Commenced 2017, ongoing
A Phase III double-blind, randomised Study to assess the efficacy and Safety of Omecamtif Mercarbil on Morbidity & mortality in patients with Chronic Heart Failure with the LV ejection fraction <35%
Global recruitment of ~8000 participants recruited.

Centera
Assoc. Prof Tony Walton
Commenced 2015, in follow-up
A non-randomised, prospective, multi-center trial assessing the safety and device success of the Edwards CENTERA Transcatheter Heart Valve system in patients with symptomatic severe aortic stenosis.
From 35 sites around 200 patients were from ~870 recruited.

ODYSSEY
Assoc. Prof Ron Dick
Commenced 2013, ongoing
Phase IIIb double-blind, placebo controlled multi-centered study evaluating the effect of Alirocumab on the Occurrence of Cardiovascular Events in Patients Who Have Recently Experienced Acute Coronary Syndrome. With ~18,600 Patients randomized from ~1400 sites.

TRI-River
Dr Andrei Catanchin
Commenced 2015, in follow-up
A prospective, Multi-centre international Registry of 5000 patients with newly diagnosed Atrial Fibrillation and treated with Rivaroxaban.

Engage Extension
Prof. Michael Grigg
Commenced 2017, in follow-up
An extension to the Engage Trial, the aim is to continue the evaluation of long-term outcomes of the endovascular repair while collecting long-term follow-up data on the Endurant stent graft. Patients enrolled in the Engage study were approached.
Amulet
Assoc. Prof Tony Walton
Commenced 2016, in follow-up
An Observational, post market study to collect the real world outcome data on the use of the Amulet device in non-valvular atrial fibrillation. Recruitment of 1000 patients from 75 sites.

TIGRIS
Assoc. Prof Ron Dick
Commenced 2013, completed 2017
An international, multi-centered, non-interventional Study aimed at collecting long-term risk, Clinical management and healthcare Utilisation of stable coronary artery disease in post myocardial infarction patients. Recruitment was aimed at 10,170 patients from 400 sites. In March 2017 we were notified of the decision for early termination of follow-up. All patients had been followed for min 24mths and the sponsor wanted to secure the data quality of the follow-up fates and data completeness.

Global FACT
Mr Peter Chu
Early stages of set-up
Patients with a juxtrarenal or suprarenal abdominal aortic aneurysm will be recruited for an international multi-center, non-interventional study looking at real world outcomes of a fenestrated endovascular aneurysm repair using the fenestrated anaconda device. A total of 160 patients from 17 sites will be enrolled.

COPS
Assoc. Prof Ron Dick
Under site evaluation
A double blinded, placebo controlled, randomised study in patients with acute coronary syndromes assessing what impact a low dose of colchicine has on long-term Cardiovascular outcomes. An aim of 1220 patients to be recruited across ~14 Australian sites.
The Epworth Centre for Innovation in Mental Health

Strategic vision

The Epworth Centre for Innovation in Mental Health (ECIMH) is a multidisciplinary clinical research unit, led by Professor Paul Fitzgerald and based at Epworth Camberwell that was formed during 2017. The mission of ECIMH is to develop innovative and effective new treatments in psychiatry, and to make them available to individuals with significant ongoing mental health problems. Through embedding this research within Epworth’s busy and high quality mental health service, we aim to achieve rapid translation of innovation to the care and health outcomes of Epworth patients.

Overview

Mental health disorders such as depression, anxiety disorders and schizophrenia are extremely common and contribute disproportionately to the burden of disease in our community. Although there are a wide variety of treatments available for mental health conditions, these are frequently not effective, resulting in prolonged disability and suffering for large number of people and their families. In the ongoing absence of the development of substantive new pharmacological treatments for mental health problems, there is increasing interest in the development and use of forms of brain stimulation to achieve therapeutic outcomes in this patient group.

The majority, but not all, of the treatment focus within ECIMH is on the development and improvement of novel non-invasive brain stimulation treatment techniques for individuals who have not responded to standard treatments. These approaches include transcranial magnetic stimulation (TMS) as well as a variety of newer and innovative ways of modulating brain activity.

TMS is a safe and very well tolerated technique that can be used to change brain activity in a way that is potentially helpful for a wide variety of mental health conditions. Partly through research conducted over the last decade by the leader of ECIMH, TMS has already been shown to be an effective treatment for patients with depression. TMS is now widely available in clinical services across Australia, including at the Epworth Clinic. However, we still do not know the most effective ways to provide TMS, or who can benefit the most from the treatment. We believe our ongoing research will improve TMS treatment, allowing it to improve the lives of more patients, and to do so more rapidly. We aim to personalise treatment to enhance efficacy using a variety of neuroscience and imaging tools and to develop accelerated methods of treatment application to achieve dramatically quicker treatment response.

As well as investigating the use of TMS in depression, we are expanding its use by evaluating how best to apply it as a treatment in a variety of other conditions. We already have preliminary data showing that it may be very useful for people experiencing conditions such as obsessive-compulsive disorder (OCD), autism, and even Alzheimer’s disease.

In addition to TMS, there are also a variety of other innovative forms of treatment currently under development, or for which we have studies planned. These include very mild, non-invasive brain stimulation using weak electrical stimulation, which has the capacity to be used as a treatment in a person’s home environment. In addition, we are planning to continue research into the use of magnetic seizure therapy, a treatment that we hope in the future will be able to replace the use of electroconvulsive therapy for patients with extremely severe depression. Through our local and national collaborations we are also investigating the use of some novel drug therapies, especially several approaches that appear to have potential to be extremely rapidly-acting antidepressant medications.

Epworth HealthCare is an ideal environment to embed this research. The Epworth Clinic is a busy and well run mental health service, providing clinical treatment to a large number of patients on both an inpatient and outpatient basis. The research at ECIMH is driven by the need to provide these patients with developing treatments that may have a profound impact on their health and quality of life. This is particularly important for the large numbers of individuals that do not respond to established therapies, and have limited treatment options.

Our research program is embedded within Epworth Clinic to provide patients ready access to innovative, safe and effective treatment technologies. This helps ensure Epworth Clinic is a leader in mental health research and clinical services.

ECIMH is affiliated with the Monash Alfred Psychiatry Research Centre (MAPrc) and conducts collaborative research with Monash University, the Alfred and Royal Melbourne Hospitals as well in collaboration with partners overseas, especially in Toronto.
Governance

The director of ECIMH is responsible for managing all aspects of the Research Centre’s activity. This is supported by the research team coordinator and conducted according to the guidelines and processes of the Epworth Research Development and Governance.

Capabilities

ECIMH conducts predominantly investigator-initiated clinical trials in the field of neurotechnology and innovative neurostimulation treatments for mental health disorders. Experimental and exploratory neuroscience research that has the potential to translate directly into improvements in treatment efficacy or predication of treatment response is also a priority. Industry partnered/sponsored trials are selected on the basis of quality of research design and contribution to the field, available resources, and alignment with ECIMH and Epworth HealthCare’s strategic plan.

Clinical trials to date

Investigator-initiated studies

<table>
<thead>
<tr>
<th>Trial</th>
<th>Investigators/Collaborators</th>
<th>Category</th>
<th>Status</th>
<th>Funding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theta Burst Stimulation for Treatment Resistant Obsessive Compulsive Disorder</td>
<td>PI: Professor Paul Fitzgerald$^1,2$&lt;br&gt;AI: Dr Leo Chen$^1,3$, Dr Sally Herring$^1$, Ms Karyn Richardson$^2$, Dr Odette Edelstein$^1,2$</td>
<td>Single site, internal</td>
<td>Current</td>
<td>Internal</td>
</tr>
<tr>
<td>Accelerated Theta Burst Transcranial Magnetic Stimulation for Depression</td>
<td>PI: Professor Paul Fitzgerald$^1,2$&lt;br&gt;AI: Dr Leo Chen$^1,2$, Dr Sally Herring$^1$, A/Prof Kate Hoy$^2$</td>
<td>Single site, affiliated with Adelaide Clinic trial</td>
<td>Current</td>
<td>Internal</td>
</tr>
<tr>
<td>Deep Brain Stimulation for Depression</td>
<td>PI: Professor Paul Fitzgerald$^1,2$, Richard Bittar$^4$&lt;br&gt;AI: Mark Rogers$^4$, Karyn Richardson$^4$, Caitlyn Rogers$^2$, Laura Knox$^4$</td>
<td>Epworth, MAPrc, Royal Melbourne</td>
<td>Pending (Awaiting governance approval)</td>
<td>NHMRC + philanthropic donation</td>
</tr>
<tr>
<td>Developing Magnetic Seizure Therapy as an Effective Treatment Intervention for Major Depressive Disorder</td>
<td>PI: Professor Paul Fitzgerald$^1,2$&lt;br&gt;AI: Dr Amit Zutshi$^1$, A/Prof Kate Hoy$^2$, Dr Leo Chen$^1,2$, Dr Sally Herring$^1$, Dr Odette Edelstein$^1,2$</td>
<td>Single site, internal</td>
<td>In development</td>
<td></td>
</tr>
<tr>
<td>Testing novel non-invasive electrical stimulation approaches to Obsessive Compulsive Disorder</td>
<td>PI: Professor Paul Fitzgerald</td>
<td>Single site, internal</td>
<td>In development</td>
<td></td>
</tr>
</tbody>
</table>

$^1$Epworth HealthCare, $^2$Monash Alfred Psychiatry Research Centre (Monash University and The Alfred), $^3$Royal Melbourne Hospital, $^4$Deakin University
Industry Partner or Commercially Sponsored Trials

<table>
<thead>
<tr>
<th>Trial</th>
<th>Investigators/Collaborators</th>
<th>Category</th>
<th>Status</th>
<th>Funding</th>
</tr>
</thead>
</table>
| Exploring the Relationship between Autonomic Arousal and Response to Magnetic Stimulation Treatments for Affective Disorders | PI: Professor Paul Fitzgerald¹, ²  
AIs: Dr Manreena Kaur², Megan Ross², Dr Sally Herring¹, Dr Leo Chen¹, ² | Single site, affiliated with MAPrc trial | Current    | Industry partner     |
| Medibio Depression Diagnostic Aid Confirmatory Performance Study     | At Epworth:  
PI: Professor Paul Fitzgerald¹, ²  
AI: Dr Manreena Kaur², Megan Ross², Dr Leo Chen¹, ², Dr Sally Herring¹, Dr Natalia Contreras¹, Dr Odette Edelstein¹, ², Dr Hiranthi Perera¹ | Multi-site international               | Current    | Industry sponsored   |

¹Epworth HealthCare. ²Monash Alfred Psychiatry Research Centre (Monash University and The Alfred)

Registries

ECIMH is working towards incorporation of consent to contact Epworth patients about research trials, offered at new patient registration and admission to the mental health unit. This will be developed and enacted in consultation with the Research Development and Governance Unit.

Future research directions

ECIMH has been operating for less than 6 months, and will build considerably over the coming 1–2 years. We will continue to pursue external grant funding and look forward to a broad-reaching portfolio that will assist in improving existing treatments available to Epworth patients, and increasing their access to innovative, upcoming therapies. We are pursuing a number of diverse avenues to this end, including exploring the use of the Point of Care systems to embed rating scales and virtual reality therapeutic modules, and the use of home-based, remotely supervised mild brain stimulation treatments for obsessive compulsive disorder. We collaborate extensively with Monash University, public and private hospitals and other research centres. As the team expands, so will ECIMH research opportunities and outputs.
Meet the The Epworth Centre for Innovation in Mental Health

The Epworth Centre for Innovation in Mental Health: From left: Dr Sally Herring, Megan Ross, Dr Manreena Kaur, Nadine Bouquet, Prof Paul Fitzgerald, Dr Hiranthi Perera, Dr Leo Chen, Dr Amit Zutshi

**Professor Director of Psychiatry, Director ECIMH, Professor Paul Fitzgerald**

Professor Paul Fitzgerald joined Epworth Health Care as Professor Director in Psychiatry in February of this year in partnership with Monash University. Prof Fitzgerald is a consultant psychiatrist, Professor of Psychiatry at Epworth and Monash University, and holds a Masters of Psychological Medicine and research PhD. He has been conducting mental health research, particularly focused on innovative biological treatments, for over 20 years. Prof Fitzgerald developed and leads the world’s largest program investigating the use of TMS and other novel therapies in the treatment of mental health conditions. This program has conducted over 15 randomised controlled trials and a large series of investigative studies using techniques such as MRI and electroencephalography. His research aims to better understand brain processes in mental illnesses such as depression, and how treatments can best modify these. Across his career to date, Prof Fitzgerald has published almost 400 research papers, has received over 5 million dollars in grant funding in the last 5 years from the NHMRC, ARC and a number of US based organisations and has held three consecutive NHMRC Practitioner Fellowships. He is an internationally recognised leader in mental health and brain research, and his work at Epworth will combine clinical care research and education. Prof Fitzgerald’s multidisciplinary research team includes a number of postdoctoral researchers, psychiatrists, psychologists and neuropsychologists, research nurses, research assistants and staff with biomedical engineering expertise.

**Executive Assistant to Professor Paul Fitzgerald, Nadine Bouquet**

Nadine commenced employment with Epworth in February 2017 as the Executive Assistant to Professor Paul Fitzgerald. Nadine has broad administrative experience as well as a background in Human Resources. She has spent the last four years working in a variety of administrative roles within the Mental Health sector; including referral coordination and PA roles to various consultant psychiatrists.

**Research Team Manager / Research Fellow, Dr Sally Herring**

Sally is a clinical research psychologist. She assists in the coordination of the new mental health research program, and the conduct of the clinical and experimental trials in mental health and brain disorders using brain stimulation technologies. Her research experience is in the University and not-for-profit sector, particularly in assisting with clinical research into new treatments for mental health disorders.
Research Coordinator / Research Fellow, Dr Natalia Contreras Granifo

Natalia is a psychologist with a PhD in psychology. Her clinical and academic career has focused on cognitive remediation, both on an individual and program level. She has considerable experience in clinical and cognitive research ratings within commercially sponsored mental health psychopharmacology research trials. Natalia holds research interests in the area of psychological, neuropsychological and psychosocial support of individuals with severe mental health difficulties, and has published on cognitive remediation training and work-focused supports.

ACADEMIC PSYCHIATRISTS

Consultant Psychiatrist, Dr Leo Chen

Dr Leo Chen is the Director of the TMS Program at Epworth HealthCare, academic psychiatrist on the Therapeutic Brain Stimulation Team at the Monash Alfred Psychiatry Research Centre (MAPrc) and Lecturer at Monash University. His current PhD research focuses on optimisation of magnetic stimulation techniques in the treatment of depressive disorders. He aspires to contribute to the development of treatment innovations that translate to meaningful outcomes for persons living with mental illnesses. Dr Chen is a founding member of ECIMH.

Consultant Psychiatrist, Dr Amit Zutshi

Dr Zutshi is a RANZCP Fellow and possesses an MD (Psychiatry) from the National Institute of Mental Health and Neurosciences, a premier clinical and research institute in Bangalore, India. He has substantive clinical and research experience in psychiatry, with more than 16 years involvement as a clinician and researcher on investigator initiated and industry psychopharmacology trials. He has published numerous Medline-indexed articles, and has an active interest in diagnosing and managing psychotic, bipolar, obsessive-compulsive and affective disorders.

Consultant Psychiatrist, Dr Odette Edelstein

Dr Edelstein is a consultant psychiatrist who also holds a position as an Academic Psychiatrist at the Monash Alfred Psychiatry Research Centre (MAPrc) in the Therapeutic Brain Stimulation Division. Dr Edelstein has a background in law, and a strong interest in medical ethics. Her research interests include Posttraumatic Stress Disorder, rehabilitation, and the interface between biological therapies and psychotherapeutic interventions.

Registrar, Dr Hiranthi Perera

Dr Perera recently joined the Epworth Mental Health and ECIMH team as an Advanced Trainee – Psychiatry, with additional roles at The Victoria Clinic and the Monash Alfred Psychiatry Research Centre. With a background in medical microbiology, Dr Perera has previously worked on research trials at the Royal Women’s Hospital.

HONORARY RESEARCH AFFILIATES

ECIMH is invested in conducting collaborative research that extends the scope and impact of the research we engage in. Researchers working from collaborating centres apply for HRA status before becoming involved in trials at ECIMH. A number of collaborators from the Monash Alfred Psychiatry Research Centre (MAPrc) currently have HRA status at Epworth.

NHMRC Peter Doherty Research Fellow, Dr Manreena Kaur

Dr Kaur is a NHMRC Early Career Research Fellow who holds a PhD from the Faculty of Medicine, University of Sydney. Dr Kaur has 8 years’ experience in coordinating and conducting clinical research in people with mental illness, including brain stimulation research. She has authored several peer-reviewed publications and in 2015, was awarded with two national (NHMRC and ARC) Fellowships and a Society for Mental Health Research Fellowship for her work in brain stimulation.

Research Assistant, Ms Megan Ross

Megan holds an Honours degree in psychology, has worked across psychology and health in areas such as homelessness and program feasibility for mHealth and Telehealth programs. She is currently working on a trial exploring heart rate as a predictor of response to magnetic stimulation treatment for depression at Epworth Camberwell.

Research Assistant, Ms Laura Knox

Laura has completed a Masters in Counselling, and currently coordinates an NHMRC trial of Deep Brain Stimulation in the treatment of severe depression, conducted at MAPrc and soon to commence at Epworth Camberwell.

Research Assistant, Ms Caitlyn Rogers

Ms Rogers has completed a Bachelor degree with Honours in Psychology. She has previous research experience involving the application of non-invasive brain stimulation and clinical and cognitive assessments, and is currently involved in coordinating a clinical trial involving participants with Alzheimer’s disease.

Research Assistant, Ms Kirsten Gainsford

Kirsten has completed a Bachelor of Applied Science (Psychology) with Honours. She has experience using transcranial direct current stimulation (tDCS) and transcranial magnetic stimulation (TMS) to investigate their use as treatments for cognitive difficulties in various populations. She is also currently co-ordinating a trial investigating the efficacy of Ketamine as a treatment for depression.
“At the most direct level, research gives patients access to developing treatments that can have a profound impact on their symptoms and functioning,” Professor Paul Fitzgerald says.

Paul joined Epworth in February, as the inaugural professor director of psychiatry, in partnership with Monash University. Paul’s appointment has also launched the Epworth Centre for Innovation in Mental Health.

“By far the most satisfying part of my role is seeing patients achieve dramatic and life-changing benefits when treated as part of innovative research protocols. On another level, research can provide critical hope to patients: the sense that something is in the pipeline for the future, especially for patients struggling with illness not responding to established treatments.

“My focus so far has been to get a number of research studies up and running as quickly as possible. I have been excited by the openness to research and new ideas at Epworth and the programs in place to facilitate this,” Paul says.

“By far the most satisfying part of my role is seeing patients achieve dramatic and life-changing benefits...”

Paul, a world leader in transcranial magnetic stimulation (TMS), is working to establish a unique clinical research program, with involvement from patients at Epworth Clinic. The centre’s research will focus on some of the key conditions the clinic sees regularly, and will include exploring novel brain stimulation treatments for depression, obsessive compulsive disorder (OCD), post-traumatic stress disorder (PTSD) and dementia.

TMS is one such brain stimulation treatment currently used at Epworth Clinic, mostly to treat severe depression. There is now a highly promising range of other similar treatments in development.

“I’ve been doing research for about 20 years now, the majority focused on the technology end of the psychiatry spectrum,” Paul says. “Using technological tools to investigate and understand brain activity, but also developing and clinically testing a number of new forms of treatment using brain stimulation.”
Paul has run more than 15 clinical trials using TMS and related technologies in the treatment of depression, and more recently conditions like OCD, Alzheimer’s disease and PTSD.

“As that research has expanded to other disorders beyond depression, we have also developed studies using other brain stimulation techniques, including types of stimulation that prove to be a replacement for electroconvulsive therapy and other invasive forms of treatment for more severe patients,” Paul says.

Paul has two key trials commencing at Epworth this year: finding novel treatments for OCD, and personalising treatment for patients with depression.

“The first trial explores the use of TMS in patients with OCD. This is a disorder where there are large numbers of patients who don’t ever get treated. It is a relatively common condition — affecting one to two per cent of the population, and about half the patients with OCD don’t respond to standard treatments and remain chronically disabled. There’s a major unmet treatment need in that disorder,” Paul says.

He notes that there is a surprising lack of innovative treatments under development for OCD — with very few new drugs or other treatments being tested.

“I think that’s an area I have considerable passion for, because if we can develop TMS as a successful treatment in that patient group, it will have very substantial impact on people’s lives — in the same way that TMS has [had] for depression,” Paul says.

“We are also looking into improving the efficiency and efficacy of depression treatments, to reduce time spent in hospital. To help us achieve this, we want to integrate technologies into therapy that help us dynamically investigate brain activity in a way that can directly drive how treatment is administered, to hopefully take patient outcomes to a new level.

“One of the main things that technological development in psychiatry has facilitated is the capacity to think about how we can personalise treatments. A lot of current treatments are a one-size-fits-all approach — everyone gets the same dose of a drug, or the same type of psychotherapy or the same type of brain stimulation.

“We’re getting to the point now where we can use brain imaging, genetics and other ways of investigating brain function to begin determining the way people are treated. It’s an approach that naturally fits with brain stimulation, because we are often targeting very small areas so we can use brain imaging to increase the fidelity and accuracy. It’s also an approach that I think has got application across the board,” Paul says.

“We really want to be at the forefront — not only of developing those technologies — but of working with industry partners and other groups to bring personalised mental illness treatment to patients as quickly as we can.”

The Keable Family Mental Health Fund supported the launch of Paul Fitzgerald’s TMS Lab and mental health research at Epworth Camberwell. The dedicated innovation fund will support ongoing innovation in mental health research, through the full establishment of the mental health lab and dedicated mental health staff scholarships.
Emergency department – Epworth Richmond

Strategic vision

The emergency department (ED) will facilitate and conduct research which adds to the scientific knowledge in emergency medicine of illness, diagnosis, treatment, service, quality and safety.

Overview

The new Epworth Richmond ED opened in February 2016 with an expanded capacity of 35 beds. It is the largest private Emergency Department in Australia, treating over 28000 patients in 2016–2017 and admitting over 11400 patients.

Our research ambitions are evolving with focus on achievable, quality small-scale research projects usually performed in collaboration with others whose interests intersect with ours.

Emergency Nursing staff contribute yearly to the Emergency Care Clinical Network (Evidence-based care improvement projects) small scale projects that look to improve the care provided in Victorian emergency departments.

Summary of Activity

CURRENT

Cases of Thunderstorm Asthma Presenting to a Private Emergency Department
Assoc/Prof R Sultana, Dr Michael Sutherland, Assoc Prof Dean McKenzie [Biostatistician, Epworth Richmond], Dr Michael Fahey, Dr Madawa W. Jayawardana, Mr John Evans, Dr Jo Dalglish, Dr Marcel Berkhout, Dr Brett Factor, Dr Justin Welsh, Dr Eamonn McKeown, Dr Claude Fahrer, Dr Dominik Stepiew, Dr David Chorowski, Dr Jennifer Mines, Dr Timothy Campbell

Improving the identification and management of severe sepsis
Bronwyn Potton [evidence-based care improvement project]

ABOUT TO COMMENCE

Establishing a database from Epworth HealthCare’s Continuum of Concussion Care
Principal Investigator [A]: Professor John Olver
Associate Investigator [A]: Dr. Jo Sherry
Associate Investigator [B]: Dr. Rose Acher
Associate Investigator [C]: Mr. Chris Byrne
Associate Investigator [D]: Ms. Megan Hamilton
Associate Investigator [E]: Ms. Melinda Frith
Associate Investigator [F]: Ms. Bianca Fedele
Associate Investigator [G]: Associate Professor Ron Sultana
Associate Investigator [H]: Associate Professor Bill Nimorakiotakis

Using Map-Enabled Experiential Review to Quality Improvement
Principal Investigator [A]: Annie Curtin

IN PLANNING

Trauma Care at Epworth: Audit of trauma patients presenting to Epworth Richmond
Dr Salomon Zalstein MBBS, B Med Sc, FACEM, Grad Cert Emerg Hlth
Assoc. Prof Ronald Sultana
General Surgery and Gastrointestinal Research Unit

MR GARY CROSTHWAIT

Strategic vision

The General Surgery and Gastrointestinal Research Unit facilitates and conducts research, which translates into improved quality and safety for Epworth patients, as well as fostering a research expertise and development for training registrars.

Overview

The Epworth General Surgery and Gastrointestinal Clinical Institute encompasses gastroenterology and general surgical disciplines and is led by Mr Gary Crosthwaite as institute director and Amanda Christie as clinical institute coordinator. These appointments have been instrumental in establishment of robust teaching units supervising accredited and unaccredited trainees in association with teaching unit visiting medical officers.

The Institute employs a Colorectal Fellow and two surgical registrars at the Epworth Richmond campus and one registrar at Epworth Eastern. There are two teaching Units at Epworth Richmond and a third teaching unit sited at Epworth Eastern.

The Epworth/Cleveland Colorectal Fellow Program was established in 2011 and has resulted in four Masters of Surgery degrees and one doctor or medical science degree as well as more than 20 publications and awarding of three Epworth Research Institute major grants.

We have refined our long-term plans to ensure they are consistent with the strategic direction of Epworth HealthCare, with an emphasis on establishing collaboration with Monash Partners and other institutions such as Austin Health, The Royal Melbourne Hospital and Peter MacCallum Cancer Centre.

A critical component of expanding the research culture and capacity within the Institute is providing opportunities for staff and trainees to have exposure to, and be inspired by colleagues, and to have access to appropriate training. In 2017 and beyond we hope to make the conduct of research by trainees and institute staff a core part of our clinical service activity.
## Summary of activity

<table>
<thead>
<tr>
<th>Study Number</th>
<th>Principal Investigator</th>
<th>Title</th>
<th>Organisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>EH2016–128</td>
<td>Assoc. Prof Gregor Brown</td>
<td>Endoscopic Polypectomy on Clopidogrel; RCT</td>
<td>Epworth HealthCare, Alfred Hospital</td>
</tr>
<tr>
<td>LR195–14</td>
<td>Assoc. Prof Gregor Brown</td>
<td>Towards the discovery of a chemoprevention strategy to reduce the burden of colorectal cancer. Collection and analysis of colon adenoma tissue.</td>
<td>Epworth HealthCare</td>
</tr>
<tr>
<td>689–15</td>
<td>Alexander Heriot</td>
<td>Identification of novel prognostic markers and therapeutic targets in colon and rectal cancers</td>
<td>Epworth HealthCare</td>
</tr>
<tr>
<td>677–15</td>
<td>Ameara Dean</td>
<td>SURGICAL HUMIDIFICATION: The effect of surgical humidification on local and systemic inflammation and peritoneal trauma in colorectal cancer surgery</td>
<td>Epworth HealthCare</td>
</tr>
<tr>
<td>EH2017–196</td>
<td>Angus Lee</td>
<td>Outcome of Emergency and Urgent versus Elective Colorectal Cancer Resection: Results from Bi-National Colorectal Cancer Audit</td>
<td>Epworth HealthCare</td>
</tr>
<tr>
<td>EH2016–146</td>
<td>Douglas Stupart</td>
<td>Effect of bowel prep for colonoscopy on intestinal microbiota and mood</td>
<td>Epworth HealthCare, Deakin University</td>
</tr>
<tr>
<td>LR220–15</td>
<td>Philip Smart</td>
<td>An Exploratory Study to Apply the Intelligence Continuum Model to Facilitate Decision Efficiency and Best Practice in the Context of Colorectal Surgery</td>
<td>Epworth HealthCare</td>
</tr>
<tr>
<td>LR157–13</td>
<td>Wendy Brown</td>
<td>Development of a bariatric surgery clinical quality registry</td>
<td>Epworth HealthCare, Monash University</td>
</tr>
</tbody>
</table>
Health Informatics Management Unit (HIMU)

Strategic vision

The HIMU will facilitate and conduct high quality cutting edge research in various key aspects of digital health which is focussed on enabling superior patient-centred high value care to ensue. The HIMU will strive to translate all learnings and findings when possible into improved outcomes for Epworth HealthCare patients and thereby also facilitate at all times the delivery of high value, efficient and effective care to ensue across Epworth.

Overview

The HIMU conducts leading research in various key aspects of digital health. Given the importance especially in the domain of health informatics to develop global and industry collaborations in order to conduct high quality research the unit has continued to pursue international and industry partnerships in 2016/2017.

Specifically, during this last year, 1 July 2016 to 30 June 2017, the Health Informatics Management Unit has once again been very industrious and hardworking resulting in many notable achievements. This is now its second year of the new structure and collaboration with Deakin University that began as of 25 May 2015 when Professor Wickramasinghe joined Deakin’s Faculty of Health as its Professor in Health Informatics Management. Clearly, this structure is working well, as it has resulted in being involved with securing several grants most notably an ARC grant and the launch of a very successful health MBA unit ‘Introduction to Health Informatics Management’.

What is particularly impressive, is that the unit has been very effective at leveraging the benefits from previous successes; such as the learnings from the Harvard Business School event in which Professor Wickramasinghe was accepted to participate in 2015, that has now led to a research stream focussing on technology to support analytics and value based-healthcare and bundled payments, as well as the Schoeller Senior Fellowship that was awarded to Professor Nilmini Wickramasinghe 11 June 2015 at Nuremberg, Germany, for her research in pervasive technologies and chronic disease management, which has developed further collaborations with the Friedrich-Alexander University, Nuremberg, Germany, including: securing research grants and establishing a joint PhD program.

Other unique activities and achievements through the course of the year include:

1. The launching of the Digital Health Futures Forum – an informal, quarterly event structured to engage and facilitate discussion on critical topics in digital health and how best to utilise these advances at Epworth. This event is made possible by sponsorship secured from Aginic.

2. Professor Wickramasinghe and Ms Louise O’Connor continue their multi-phase research work on demonstrating the benefits of the Point of Care solution as well as identifying more opportunities to leverage benefits from this solution for Epworth.

3. Health informatics has featured significantly throughout the annual Epworth Research Week activities.

4. On the research side: four books were published and another has just been completed for submission in July 2017.

In addition, not only has the unit maintained, if not increased, its peer review journal publications, but it has also had some high profile acceptances including: Australian Journal IS, Information and Management, Journal of Healthcare Quality, Journal Injury Prevention, and Journal Association of IS.
Governance

The HIMU has in place a transparent and rigorous reporting and governance structure to ensure that at all times research excellence and integrity is maintained and it is led by Prof Nilmini Wickramsinghe. Specifically, monthly team meetings are held in which all aspects of research and collaboration activities are discussed, updated and reported upon and minutes of these meetings are recorded. In addition, the unit provides quarterly research reporting and annual reporting outputs to the director of research. Further, the salaried team members also complete the required PDP requirements and are fully compliant at all times with all required e-learning modules.

Reporting and compliance for specific projects is also conducted as stipulated to comply with respective ethics committee requirements, granting/funding body requirements and university requirements.

Capabilities

As digital health issues are relevant across Epworth, research conducted by the HIMU includes all Epworth sites to a greater or lesser degree. In addition, research is conducted at various leading international healthcare organisations throughout Australasia, Europe and North America. In this way, the HIMU ensures that leading edge initiatives and key findings in the domain can be identified, captured and then as appropriate be incorporated into Epworth. Given the international standing of Professor Nilmini Wickramasinghe in the health informatics domain, the HIMU has developed very strong international and industry linkages which enable it to conduct high quality research and leverage needed capabilities.

The HIMU currently has three research assistants with PhDs, five PhD candidates and two master students. In addition it has two associate professor research affiliates. The unit also has visiting PhD and Masters students from Germany.

In 2016/17, HIMU staff were involved in 10 keynote and invited presentations, 19 conference presentations, 20 peer reviewed journal publications, 28 posters, 20 book chapters and four books.

Current Projects


Synopsis: This study investigates the potential to leverage the existing Point of Care system to perform an e-discharge consult. The focus is initially on urology patients. Given that our VMOs often encounter delays to see their patients before they are discharged, the proposed initiative by enabling VMOs to perform a discharge via the Point-of-Care solution in a telemedicine capacity will enable more timely discharge and better patient satisfaction. Currently, all technical aspects have now been completed and patient recruitment has started and clinical trials will commence after this.

The project will continue in 2017–2018.

2. DiaMonD (diabete monitoring device) – Wickramasinghe, N., Goldberg, S (inet Intl. Canada) setting up to run trials in Canada, China, Germany, India, Pakistan, and USA.

Synopsis: This longitudinal project has investigated and established proof of concept for using a mobile solution to facilitate better self-management of diabetes type 1, typ2 and GDM. Current extensions to the project which form the major focus for 2017–2018 include developing non-non-invasive solutions for blood glucose measurement and designing and developing a portal solution to support on-going motivation and management.

3. Patient specific medical solutions through hybridised medical imaging, 3D digital rendering and additive manufacturing – Wickramasinghe, N. Pedagogous, G., Gibson, I (Deakin University) and Mahzer, M. (Deakin University)

Synopsis: 3D printing VR and augmented reality hold many benefits for clinicians to deliver superior care to our patients. This project is trying to systematically assess opportunities and potential for these technologies for Epworth HealthCare. The study began in 2016–2017 and will continue in 2017–2018.

4. Predictive Analysis to Enhance Healthcare Outcomes: Wickramasinghe, N., McConchie, S., Sako, Z (Deakin University), Eigner, I. (FAU, Germany), Hamper, A. (FAU, Germany), and Bodendorf, F (FAU, Germany).

Synopsis: Data coupled with data science and analytics techniques have a critical benefit to ensuring superior healthcare delivery today. This research stream brings expert techniques from Germany to Epworth healthcare data so that we can optimally and strategically analyze our data sets to provide the best insights for clinical care, administrative and reporting needs and support strategic areas and clinical research. Part of this research stream is now funded through successful 2017 ERI large grant. The research will continue in 2017–2018.
5. **Point of Care Assessment for Business Value:**
   Wickramasinghe, N., O’Connor, L.
   **Synopsis:** This project has received industry support from OneView to perform an assessment and evaluation of the Point of Care solution and its potential to enable the delivery of patient-centred, value based care. This ongoing study has already identified important areas such as risk assessment and mobile home monitoring follow up. These two aspects will form the primary focus for 2017–2018 and it is anticipated that the findings will have far reaching impacts.

6. **Mobile Home Monitoring:**
   Wickramasinghe, N., O’Connor, L and Smart, P.
   **Synopsis:** Leveraging from the assessment of the Point of care solution, this study has identified the benefits to Epworth patients of following up via mobile phone reminders post discharge. The current focus is on colorectal patients to remind them regarding key post discharge points such as hydration. Clinical trials will take place in 2017–2018.

7. **Multi-centred Study to Measure User satisfaction:**
   Wickramasinghe, N., Muhammed, I., and Haddad, P.
   **Synopsis:** As Epworth introduces new systems for clinical and patient users it is essential to assess satisfaction of these systems by both key user groups. This study focuses on assessing insights from clinical and patient users regarding various systems including WebQI, Point of Care and ARIA. The study will continue in 2017–2018 and expand its scope to include further systems.

8. **Intelligence Continuum – Smart P., Wickramasinghe, N., Schaffer J. L. [Cleveland Clinic]**
   **Synopsis:** This study was funded by a 2015 ERI large grant. It focusses on applying analytic techniques to colorectal patients to identify key important treatment variations and identify impacts of these on outcomes as well as the impact of age, co-morbidities and timing of surgical intervention.
The rise of technology in healthcare has meant the potential for vast improvements in the collection and storage of patient information. Compared to paper-based models, information in and across hospitals can now be collected and stored at phenomenal levels.

A key challenge has become finding the best way to access and utilise these big data sets to their full potential. Hospitals currently find themselves with more information than they know what to do with, in critical areas in a patient’s history, such as allergies, treating specialists and medications.

Health Informatics Management is a research discipline that includes working to consolidate and utilise this data, to improve patient care, reduce costs and create more empowered patients.

“Better information for staff and patients means better access to services, better quality healthcare and improved efficiency and effectiveness of treatment,” says Epworth Professor Director Health Informatics Management and Deakin University Professor Health Informatics Management, Nilmini Wickramasinghe.

“Current clinical data — pulled from systems across the organisation for different patients and procedures — and analysed appropriately can tell us, for instance, how we might anticipate [those] patients who will need a little more care while they are with us. We could then convey this to nurses and doctors using a traffic light system: green for patients who are doing really well, orange for potential problems and red for the ‘high-flyers’.”

“Firstly, we need to see how we can best pool the data we have — currently sitting in different systems and repositories — together, and ensure [the data] is of equal quality and as complete and accurate as possible. Then we could use this data to identify the factors we need to watch to manage and mitigate patient risk. This information can then be used to create new processes and technologies that alert clinical staff to a patient requiring more tailored care, and at discharge to remind the patient [of] the steps they need to take at home,” Nilmini says.

Mobile applications or bedside information terminals such as the point of care (POC) system, are key health information tools for providing better care for patients.
The POC project is one of our flagship projects. We started looking at an overall assessment of the POC system from its conception and how it has changed our clinical landscape. We have also found opportunities to leverage off that initial investment, which we think is very exciting,” Nilmini says.

One of these opportunities is the eViewer project, which looks at electronic opportunities to improve patient discharge via POC. This project includes Associate Professor Jeremy Grummet, Ms Louise O’Connor and Prof Nilmini Wickramasinghe who are well supported by Mr Andrew Eriksson.

"Obviously the patient is very excited to be going home, but there is a lot of planning that needs to occur around this, which can impact the efficiency of the entire ward," Nilmini says. "The necessary paperwork needs to be completed, which relies on a doctor’s final assessment, and the room needs to be prepared for the next patient. However, if the doctor is delayed for whatever reason, the patient needs to wait and this can cause a ripple effect.

If you have a discharge system available to the patient through POC, this means the current patient is not prevented from going home in a timely fashion and there are less delays to future patients on the ward. The proposed eViewer system will help the process to flow more smoothly."

Nilmini is also looking for opportunities to continue Epworth’s relationship with the patient once they have left hospital.

"There are two phases to a patient’s recovery at Epworth. One is while they are in the ward and the other when they go home. We don’t want to forget our patients once they walk out the door. We have that ability now to analyse the data and ensure patient care can continue after they leave.

“We are always looking for ways to extend the care we provide to patients,” Nilmini continues. “Which is what has led us to look at home monitoring”; a project Dr Phil Smart, Ms Louise O’Connor and Prof Nilmini Wickramasinghe are initiating with the Point of Care system. "Currently, our focus is stoma patients, advising them on hydrating for example — which sounds very simple but is actually critical for this type of patient — particularly if it is a hot day. A mobile app solutions is currently being explored which would provide an alert to remind the patient to hydrate [him/herself] in summer.

The app has a lot of benefits. It helps the patients to feel Epworth is still there for them, even once they have left the hospital. It also allows patients to maintain a better sense of their own health, so they don’t fall behind whatever levels they should be at. Otherwise, they can end up having to return for a preventable emergency-type intervention, leading to an unplanned re-admission.”

The best way to ensure Epworth provides high-value care to the patient lies in finding and using the right data, at the right time, and knowing how to join the dots.

“Health Informatics Management is not only about collecting and analysing healthcare data, but [also] presenting it to a clinician and the hospital executive team, so they can make more informed, better decisions around their area of expertise,” Nilmini says.

The informatics team was part of a Deakin University led project that recently secured one of three nationally-awarded Australian Research Council (ARC) grants, to develop an assisted-living technology hub. The funds will help Nilmini to further home monitoring and mobile technology for patients.

“We are always looking for ways to extend the care we provide to patients...”

“It’s so important for patients, and their families, to know how to manage their condition once they leave the hospital. To have a better understanding of the dos and don’ts; how [patients] can ensure a better state of wellness and health. We all want to be well and healthy and it is important for everyone to be active in that; patients and healthcare providers” Nilmini says.

Nilmini is also collaborating with groups in Germany, North America and China, to examine how diabetes can be better managed in areas where chronic diseases are widespread.

“We are looking at developing non-invasive testing options for diabetics, using biosensors to detect blood sugar levels, so diabetics don’t have to prick their finger. That’s very appealing, particularly in China, because culturally people don’t like to prick their finger and draw blood. It is hard to get people to test their blood regularly,” Nilmini says.

“The sensors would be connected to a mobile solution, already developed and trialled successfully at Epworth with gestational diabetes patients a few years ago. The person receives an alert about what level their sugars are at scheduled times, after the sensor has automatically tested them.

“You want to have technology solutions that [are] patient-centric, but [that] also improve quality [and] access, and are efficient and effective to provide higher value care. In the hospitals of the 21st century, who isn’t going to want to focus on digital health and technology?”

In December, Nilmini together with the organising committee which includes Associate Professor Genie Pedagogos, Ms Karen Kinmont, Mr Gary Trytell, Dr Damion Claydon-Platt, Mr Steven McConchie, Dr Stephen Vaughan, Dr John Zelcer and Professor Nik Zeps, launched a regular Digital Health Futures Forum, where people may come and present key topics in health informatics. The forum provides doctors, staff and the executive team with a chance to learn from and share with colleagues in an informal environment. Forums are held every quarter.
Strategic vision

We have refined our long-term plans to ensure they are consistent with the strategic direction of Epworth HealthCare, with an emphasis on strengthening collaboration with our Monash partners and other Epworth ICUs. We have therefore chosen to have a mix of external multi-centre studies and ER-ICU investigator initiated studies, with the latter group including staff undertaking higher degrees. We only receive funding for a small number of studies, however having the research coordinator funded independently allows us to undertake other important work.

A critical component of expanding the research culture and capacity within the ICU is providing opportunities for staff to have exposure to, and be inspired by colleagues, and to then have access to appropriate training and support. We have already increased nursing attendance at conferences, which resulted in one nurse undertaking a master’s degree in 2017. At least three nurses plan to commence masters degrees in 2018, and two consultants have started discussions with potential supervisors with a view to commencing a PhD by publication at Epworth Richmond commencing 2018.

Overview

The new Epworth Richmond ICU opened in February 2016 with an expanded capacity of 26 beds. It is a tertiary level ICU that caters for most major specialties other than transplant surgery and road trauma. In the 2016–2017 financial year, we admitted 2405 patients; 80% of admissions were post-operative, with most of these being low acuity patients, however 24% were following cardiothoracic surgery; 729 patients were ventilated.

Jonathan Barrett commenced as Deputy Director ICU and Head of ICU Research in December 2015, and Gabrielle Hanlon subsequently took up her full-time position as ICU Research Coordinator in March 2016. These inaugural research positions have been instrumental in the establishment of a broad multi-disciplinary ICU research portfolio.

Governance

The ICU research group is led by Dr Jonathan Barrett and is supported by Mrs Gabby Hanlon (ICU Research Coordinator). Working together with their colleagues they have oversight for the development of protocols, their support and conduct.

Summary of activity

**COMPLETED STUDIES**

**External Multi-centre Trials**

**Transfuse**
STandaRd Issue TrAnSfusion versuS Fresher red blood cell Use in intenSive care.

Chief Investigator: Prof Jamie Cooper, Monash Partners
Epworth PI: Dr Jonathan Barrett
International multi-centre randomised double-blinded phase III trial of the effect of standard issue red blood cell blood units on mortality compared to freshest available red blood cell units. Completed December 2016. Epworth commenced recruitment in May 2016 and enrolled 30 patients. NHMRC funded

**ETHICUS II**
End-of-life practices in intensive care units around the world.

Chief Investigator: Prof Charles Sprung, Hadassah Hebrew University Medical Centre, Israel
Epworth PI: Dr Jonathan Barrett
International multi-centre observational study. Epworth contributed 64 episodes from May to October 2016. Unfunded

**Point Prevalence Program Day 10**
Annual observational study of Australian and New Zealand intensive care practices; a joint initiative of the ANZICS CTG and The George Institute for Global Health.

Epworth Richmond PI: Dr Jonathan Barrett
Epworth Eastern PI: Dr Stephen Warrillow
Epworth Freemasons PI: Dr Nerina Harley
ER-ICU Research coordinator prepared HREC submission for Richmond, Eastern and Freemasons. Unfunded
ER-ICU INITIATED STUDIES

VEREEFY
Validation of Epworth Richmond’s Echocardiography Education Focused Year
Chief Investigator: Dr Kyle Brooks
Final data analysis in progress. ERI grant 2016

PIMS: Evaluation of a new system for intubation in ICU
Chief Investigator: Dr Diane Kelly
Trainee co-investigator: Dr Krisoula Zahariou
Preliminary results presented at Society of Critical Care Medicine meeting in January 2017. Final results presented at Australian College of Intensive Care Medicine in May 2017; presented as a poster at Epworth Research Week 2017. Manuscript being prepared to submit for publication. Unfunded

PROCESS→SCREEN A new way to review and report mortality and morbidity issues in intensive care
Single site quality improvement project
Trainee Investigator: Dr George Walker
Supervisor: Dr Jonathan Barrett
Presented as a poster at the Singapore – Australian and New Zealand Intensive Care Society conference in April 2017, and at Epworth Research Week 2017. Unfunded

Intensive Care Unit Readmission: Is a high readmission rate always bad?
Single site retrospective observational study using data from Adult Patient Database
Trainee Investigator: Dr George Walker
Supervisor: Dr Jonathan Barrett
Presented as a poster at the Singapore – Australian and New Zealand Intensive Care Society conference in April 2017, and at Epworth Research Week 2017. Unfunded

ICU Readmission Prediction Model
Swinburne statistics student project using Australia-wide data from ANZICS Adult Patient Database
Student Investigator: Philip Ellings
Supervisors: A/Prof D McKenzie, Dr J Barrett, A/Prof M Fahey (Swinburne)
Manuscript submitted for publication. Unfunded

Current Studies

EXTERNAL MULTI-CENTRE TRIALS

SuDDICU-ANZ
A crossover, cluster randomised controlled trial of Selective Decontamination of the Digestive Tract in Intensive Care Unit patients in Australian and New Zealand
Chief Investigator: A/Prof Ian Seppelt, Nepean Hospital, Sydney
Epworth PI: Dr Jonathan Barrett
Commenced May 2017, will be completed in 2020. NHMRC grant partially funded

PREDICT
A registry in critically ill patients to determine predictors of disability-free survival. Multi-centre observational study
Chief Investigator: Assoc Prof Carol Hodgson, Monash Partners
Epworth PI: Dr Jonathan Barrett
Awaiting HREC approval. Hope to commence October 2017. NHMRC funding may provide small aliquot for sites but bulk of funding is for follow up from centralised methods centre.

TEAM
Treatment of invasively ventilated adults with Early Activity and Mobilisation. A Prospective Multicentre Phase III Randomised Controlled Trial of Early Activity and Mobilisation Compared with Standard Care in Invasively Ventilated Patients in Intensive Care
Chief Investigator: Assoc Prof Carol Hodgson, Monash Partners
Epworth PI: Dr Jonathan Barrett, in collaboration with Rachel Fielding ICU Senior Physiotherapist & Ben de Zoete, Allied Health Manager. Currently exploring feasibility.

ER-ICU INITIATED STUDIES

Critical Care Interventions: A Simulation-based study
Multi-centre observational study using simulation as a research tool
Chief Investigator: Dr Diane Kelly
HREC approval granted, however implementation delayed to enable study to form part of PhD. ERI Grant 2016

Evaluation of a tool to assess non-technical skills in ICU
Single centre study using simulation as a research tool
Trainee Investigator: Dr Lois Mackley
Supervisor: Dr Diane Kelly
Data analysis in progress. Abstract to be submitted for Canadian Critical Care meeting in January. No funding

Evaluating the use of impromptu in-situ simulation to assess team performance – a pilot feasibility study
Single centre study using simulation as a research tool
Trainee Investigator: Dr Nathan Haller-Shannon
Supervisor: Dr Diane Kelly
Post intervention scenarios in progress. No funding

Correlation of peripheral venous collapse with CVP as a non-invasive bedside clinical sign
Monash University medical student project
Student Investigator: Ms Tina Zhou
Supervisor: Dr Jonathan Barrett
Data collection in progress. No funding

A prospective, single centre, cohort study to determine the prevalence, treatment and outcome of delirium in Epworth Richmond Intensive Care Unit
Nurse Investigator: Ms Rebecca Ewers
Supervisor: Dr Jonathan Barrett
Study to be performed in 2018 after Rebecca has completed her Masters with Deakin University comparing two delirium tools, which will inform the larger study. ERI Grant 2017

Echocardiography training for undergraduate medical students
Single centre study evaluating medical student education program
Chief Investigator: Dr Kyle Brooks
Awaiting HREC approval
Overview

Professor Miles Prince was appointed as Director of Molecular Oncology and Cancer Immunology at Epworth HealthCare in February 2016. His five-year appointment represents an important and innovative development in cancer care at Epworth.

Professor Prince provides research, clinical and teaching leadership in Molecular Oncology and Cancer Immunology within the School of Medicine, University of Melbourne, and provides academic leadership across the Epworth group. He is actively supporting the strategic directions of both Epworth HealthCare and the School of Medicine at The University of Melbourne (UoM) within relevant academic and professional communities in Australia and internationally, as well as advancing the goals of the Epworth Cancer Clinical Institute.

Staff appointments

In this second year of operation, Professor Prince has now appointed a number of key staff to support work both at Epworth and at the laboratories at the Peter Mac Callum Cancer Centre (Peter Mac) / Victorian Comprehensive Cancer Centre (VCCC) and The Walter & Eliza Hall Institute of Medical Research (WEHI).

Appointment of Research Manager

Dr Nicole Brooks was appointed research manager to nurture an already well established research portfolio. The workload will encompass protocol development; supporting ethics applications; overseeing work flow across projects and sites; securing and managing research appointments and helping facilitate the daily activities and demands of patient recruitment and accrual. In addition, Nicole will be helping Epworth Medical Foundation staff facilitate grant applications.

Nicole is a scientist specialising in medical research and completed a doctorate at the UoM in obstetrics, gynaecology and physiology in 2007 and has worked extensively across tertiary hospitals in Victoria and most recently in a research collaboration at Peter Mac / VCCC. Nicole has worked alongside Professor Prince for many years and recently completed a project that has allowed her to join the Epworth team.

Research Fellow Appointments

Cementing relationships with research institutes has allowed Epworth to collaborate within the VCCC and in particular VCCC members Peter Mac and WEHI. Professor Prince believes that it is very important to have a conduit to smooth the path of these collaborations. To achieve this, he has created two fellowships within these external organisations who will both work on Epworth projects but also, as early career researchers, benefit from significant career development seeing them move from registrars / medical oncologists to independent researchers and consultants. This is the part that Epworth gives back to the broader medical community.

To date he has made two appointments:

Epworth / Peter Mac Clinical Research Fellow – Dr Lucy Fox.

Dr Fox is a haematologist with a speciality in oncology and an early career researcher. Lucy has been instrumental in helping bridge clinical service at Peter Mac, particularly in the translational medicine arena. She has been undertaking training in the haematology molecular genomics department whilst managing research appointments and helping facilitate the daily activities and demands of patient recruitment and accrual. In addition, Nicole will be helping Epworth Medical Foundation staff facilitate grant applications.

Epworth / Walter & Eliza Hall Institute Clinical Research Fellow – Dr Daphne Day.

Dr Day is a medical oncologist and an early career researcher with a particular interest in phase I clinical trials. She has recently been appointed and there will be opportunity for her to play a key role under the clinical trial umbrella in the service genomics space. Similar to Dr Fox at Peter Mac, she will be undertaking training in the solid oncology molecular genomics department as well as helping other ‘non-research’ clinicians into the research world and offer them access to clinical trials for their Epworth patients.

In addition to these appointments, and as part of his vision, Prof Prince has identified the need for a MOCI medical director/advisor. Costas Yannakou, Haematologist specialising in molecular genomics, will be employed to consult and advise on the clinical and research activities within the MOCI umbrella. Costas comes with a wealth of experience from...
Pmac, VCCC, where he has worked in the Haematology molecular genomics lab for an extensive period of time. Costas will take on a clinical appointment at Epworth as well. We look forward to welcoming Costas in the near future.

Epworth Tissue Curator

Ms Hayley Johnston was appointed into this role in July 2017. Hayley is an experienced scientist and laboratory manager with particular expertise in cryo-preservation and tissue handling and processing. Her role is many and varied. Based at Epworth she is responsible for:

- Tissue collection of all tissue samples required for the current molecular oncology projects which cover haematological, urology and renal, endometrial, thyroid, ovarian and pancreatic cancers.
- Curator of tissue collected which involves the laboratory processes to safely freeze and store the samples in optimum conditions until they are required at the Peter Mac or WEHI Laboratories for analyses;
- Laboratory manager for the Laboratory based at Epworth education and research building on Hoddle street. Hayley will be instrumental in ensuring that the laboratory becomes NATA accredited. In addition, the laboratory will be a hub for all tissue processing, handling and storage. As the work flow increases, a research and laboratory team will be established so there will be provision for a research clerk / laboratory assistant and clinical research coordinator.

Epworth scientific appointments at Peter Mac / VCCC

Epworth has appointed a medical scientist, Bhargavi Yellapu (and will recruit another junior scientist) whom will be permanently seconded to the Peter Mac / VCCC molecular genomics laboratories to generate genomic analyses on all joint Epworth / Peter Mac projects.

Projects

In the past six months, together with a major project in haematological cancer being undertaken by Professor Prince and his team, a further five oncology projects have been initiated that will fall under the MOCI banner.

In no particular order the following projects are underway, and each investigator will be under the guidance and directorship of Prof. Miles Prince.

- Dr Rachel Delahunty is a medical oncologist with interest in translational and clinical research in the field of gynaecological oncology. Her project, Assessing Circulating Tumour DNA as a Predictive Biomarker in Type 2 Endometrial Cancer. This is an exploratory, pilot study to investigate the potential use of circulating tumour DNA as a novel blood-based biomarker for the management of endometrial cancer. It is hypothesised that ctDNA will be a biomarker to guide treatment. Defining those most and least at risk of recurrence based on ctDNA could minimise toxicity and maximise benefit by helping to select the patients post like to benefit. The primary tumour resected at surgery will form the basis of the ctDNA analysis. A personalised tumour mutations profile will be created for each participant based on analysis of the primary tumour using a specific tumour panel. The personalised tumour genetic mutation profile established from the primary tumour tissue sample will then be matched to the ctDNA profile collected from the participants at each time-point assessed, and a quantitative comparison level will be determined. The molecular analyses for Rachel’s samples will take place at PMac.

- Dr Sumitra Ananda is a medical oncologist with sub-specialties in gastrointestinal and gynaecological cancers and an experienced post-doctoral scientist. She was part of the group that completed significant work in colon cancer to prove that detectable circulating tumour DNA (ctDNA) in the blood is an accurate marker for recurrent cancer and further to provide an accurate test (assay) for such detection of recurrent colon cancer.

Advanced pancreatic cancer is a devastating disease with few effective treatments. EGFR inhibitors have been shown to produce a slight improvement in survival. However, over 80% of patients with pancreatic cancer have RAS mutations, which, in colon cancer, confer resistance to this class of drug. It is possible therefore that the small proportion of patients who have RAS wild-type pancreatic cancer may derive a much more significant benefit from EGFR inhibitors. Previously, we have demonstrated that it is possible to determine the presence or absence of RAS mutations within the tumour using tissue obtained at the time of routine diagnostic endoscopic ultrasound. We propose using endoscopic ultrasound guided biopsy to select a small group of patients with RAS wild-type advanced pancreatic cancer for a phase II trial examining the efficacy of panitumumab, an EGFR inhibitor.

- Dr Daniel Croagh is the principal investigator on what could be the first successful prospective trial of targeted chemotherapy in pancreatic cancer.

Dr Piers Blombury, senior haematologist oncologist and specialising in haematological molecular genomics primarily aims to develop, optimise and validate ctDNA-based assays (including complementary genomic techniques) to be used in the detection and monitoring of ctDNA in B-cell malignancies (including lymphoma and myeloma) to a diagnostic standard in a NATA-accredited laboratory (note: such accreditation is necessary to implement these methodologies into standard clinical practice). Subsequently, to implement these assays as part of the routine clinical genomic testing offered through the Molecular Haematology Laboratory at VCCC which is partnering with the Molecular Oncology and Cancer Immunology Department.

- Dr Sumitra Ananda is a medical oncologist with sub-specialities in gastrointestinal and gynaecological cancers and an experienced post-doctoral scientist. She was part of the group that completed significant work in colon cancer to prove that detectable circulating tumour DNA (ctDNA) in the blood is an accurate marker for recurrent cancer and further to provide an accurate test (assay) for such detection of recurrent colon cancer.

Whilst it is well recognised that ctDNA is a marker of recurrent disease, in many cancers including Ovarian cancer the assays to prove this are lacking. Dr Ananda aims to demonstrate that detectable ctDNA in a blood test
following surgery to remove the primary ovarian tumour or following completion of chemotherapy will be a reliable indicator that the cancer has returned.

There has been a lot of interest in this project and Dr Ananda is collaborating with Walter and Eliza Hall Institute where the laboratory work will take place and John Hopkins in the United States. All patients involved are undertaking treatment for Stage I – III Ovarian cancer at Epworth.

- Dr James Lee is a specialist endocrinologist who recently completed a PhD where he developed a fine needle aspiration (biopsy) test (FNA) for the detection of thyroid cancer to provide better accuracy than the current standard diagnostic testing. Whilst thyroid cancer is on the rise in the community, many patients have low level disease and can just be monitored rather than have active treatment. Common treatment for thyroid cancer is surgery which has the effect of requiring the patient to then go on life-long medication. Dr Lee’s molecular oncology project takes FNA to the next step as he aims to enhance the diagnostic capabilities of FNA using the highly sensitive Next Generation Sequencing technology available at Peter Mac / VCCC.

Both Drs Ananda and Lee were recipients of Epworth Research Institute grants in the 2017 grant round.
We are creating pathways for a new era in cancer care

In early 2016, Professor Miles Prince joined Epworth as the inaugural Professor/Director of Molecular Oncology and Cancer Immunology. His appointment marked the launch of precision genomics medicine at Epworth.

The new role meant Miles would be building a comprehensive genomics service at Epworth from the ground up.

“The past year has been about establishing and looking for opportunities to make a big difference,” Miles says.

The terms precision medicine, personalised medicine and individualised medicine are frequently used interchangeably. Precision medicine in cancer management is about trying to get as much molecular genomic information about a patient’s cancer as possible. Miles is now working to establish a day-to-day service, where patients who need it are able to access the best genomics data.

“There are some cancers where this sort of information can be really helpful for diagnostics; working out what sort of cancer the patient has. Some patients present with a cancer where, despite the best current testing, it is completely unclear where the mutant cancer cell originates from. Now, using sophisticated genomic testing, we can examine for mutations and work out whether it is, for example, more likely to be a melanoma, or a strange lung cancer, or a blood cancer,” Miles says.

“Other times you know what cancer it is but you need more information about it, such as how is it going to respond to treatment? Thus, we can forecast better, which may help us choose, or avoid, a particular treatment.

“Finally, the ultimate goal of precision genomic medicine is matching the right drug to the known genomic profile of that patient’s cancer. In terms of tailoring treatment, the next phase of personalised medicine is to develop more comprehensive off-the-shelf tailored medicines. As we get more and more drugs we can try and match them to the cancer,” Miles says.

Creating this from scratch means establishing frameworks for data collection; facilitating analysis of this data; escalating research activity to make the most of this information; and channelling this into real world clinical outcomes.
Examining genomic studies in bowel and head and neck cancer. We’ve also appointed a Haematology Clinical Research Fellow, Dr Lucy Fox, who is working between here and the Peter MacCallum Cancer Centre and is the clinical leader in the Melbourne Genomics Health Alliance Flagship examining bone marrow failure syndromes.

“As part of our strategy we are working closely with Dr Nik Zeps, recently appointed director of Epworth Research, and have Dr Nicole Brooks as senior research coordinator. [We] also have appointed a tissue bank scientist, a research clerk, two genomic scientists and a data manager. We don’t plan to establish all the laboratories here at Epworth, and there is no point in replicating the best international technology already available elsewhere and so we are working closely with the Victorian Comprehensive Cancer Centre, where our two scientists are located,” Miles continues.

“It’s fair to say we are leading the medical community in terms of being able to provide these sorts of resources to do this sort of work. You can see it’s fairly intense, and really a lot of it is about the people.”

As a result of these new appointments, Miles says he expects the process to accelerate very quickly. “Epworth has really taken this opportunity to develop this aspect of genomics medicine, and is looking to the future. It was hugely insightful [of] Epworth to put my position in place, because it allows me to commit to ‘eating and breathing’ this project – to make it happen rather than hoping individual doctors will be able to ‘connect the dots’.

“This is a really important project. It has to be the best quality. Ultimately we need the best possible data for our patients. In the next 12 months, we want to see easy access for day-to-day genomic analysis for patients at Epworth; I think we will see a huge difference in a year’s time.”

“Epworth has really taken this opportunity to develop this aspect of genomics medicine, and is looking to the future...”

Miles is based at Epworth Freemasons and works in collaboration with The University of Melbourne, the Peter MacCallum Cancer Centre and Walter and Eliza Hall Institute of Medical Research. In 2014, he was awarded Membership of the Order of Australia (General Division) for significant services to blood cancer research, patient care and philanthropy leadership.
Epworth Monash Rehabilitation Medicine Unit (EMReM)

Background

The appointment of an inaugural Victor Smorgon Chair of Rehabilitation was made through a collaboration of Epworth HealthCare and Monash University in July 2009. The Epworth Monash Rehabilitation Medicine Unit (EMReM), which has been designated as a research arm of Epworth Rehabilitation, commenced in July 2010. In line with the objectives of the chair of rehabilitation medicine, individuals have been supported in higher level degrees and research projects. Throughout the past year, the EMReM team (consisting of 23 individuals) have been productive in our research efforts. Staff have been involved in 21 research projects, produced 22 publications in refereed journals and collectively gained $246,205.55 in grants/scholarship. In addition, staff have presented/contributed research at 43 conferences/events and have had 19 poster presentations.

Clinical trials

Completed PhD Research

Development of a Patient-Report Outcome Measure for the assessment of adults with traumatic brachial plexus Injury [Menzies Health Institute Queensland].

Investigators:
Bridget Hill
Andrea Bialocerkowski (PI)
Gavin Williams
Julie Pallant [The University of Melbourne]
John Olver

Objectives:
The aim of this project is to develop a new patient-report outcome measure to assess functional outcome in adults following traumatic brachial plexus injury (BPI). The instrument will be an evaluative, unidimensional measure; the construct to be assessed is activity of the upper limb as defined by the International Classification of Functioning, Disability and Health.

Collaborating Organisations:
- Epworth Monash Rehabilitation Medicine Unit [EMReM]
- Menzies Health Institute Queensland [PhD]
- The Alfred Hospital
- Royal Melbourne Hospital
- Mr Scott Ferris Plastic and Reconstructive Microsurgeon private practice
- Hand and Upper Limb Centre, Perth
- Mr David McCombe – Victorian Hand Surgeons Associates

Term: 1 July 2009 – 31 December 2016
Completed Registrar Research
(Fellowship in Rehabilitation Medicine)

Investigating the effect of Vitamin D deficiency on stroke severity and functional outcome in patients undergoing rehabilitation post stroke – a pilot study

Investigators:
Glareh Arfaei (PI)
Prof John Olver

Objectives:
Recent literature has linked Vitamin D deficiency as a potential risk factor for stroke (a current major global health concern). This is alarming given the high incidence of Vitamin D deficiency reported in patients post stroke (almost 80%). The aim of this pilot study is to measure the effect of Vitamin D deficiency at admission to rehabilitation on stroke severity and functional outcome in patients after stroke. This study intends to prospectively recruit a minimum of 30 patients admitted to the Neurological Units at Epworth HealthCare for rehabilitation following a stroke. Measures for this study include: – Vitamin D level (added to patient’s regular blood test on admission to rehabilitation), stroke severity (using the National Institutes of Health Stroke Scale – NIHSS) and functional outcome (using the Functional Independence Measure – FIM).

There is limited research which has studied the effects of Vitamin D deficiency on: – earlier outcome after stroke (e.g. during the rehabilitation phase) and within an Australian population. This study is warranted given that adequate levels of Vitamin D may have a protective role for individuals experiencing a stroke and reduce cognitive and functional impairment (a core outcome of rehabilitation).

Collaborating Organisations:
• Epworth Monash Rehabilitation Medicine Unit (EMReM)


Investigating the effectiveness of Alter G treadmill training in addition to Standard Rehabilitation in restricted weight bearing patients after orthopaedic multi-trauma – a pilot study

Investigators:
Talia Cantwell (PI)
Prof John Olver
Jacqui Marks
Bianca Fedele

Objectives:
Following trauma, orthopaedic injury in the legs is common, affecting 34% of patients. This can result in walking limitations for patients such as reduced speed and/or distance able to walk. Standard rehabilitation at Epworth HealthCare care includes: – physiotherapy, strengthening exercises and gait retraining (at times using a newer innovation; the Alter G treadmill).

The Alter G is an anti-gravity treadmill which uses differential air pressure technology to reduce the amount of body weight the legs have to support (suitable for patients with orthopaedic injuries). However, there is limited research to date that shows the Alter G improves patient outcomes beyond standard rehabilitation. The primary aim of this study is to compare the effectiveness of Alter G treadmill training in combination with Standard Rehabilitation versus Standard Rehabilitation alone in terms of gait functioning [speed of walking and distance walked]. Measures include: 10 metre walk test, 6 minute walk test, length of rehabilitation stay [days] and Functional Independence Measure (FIM). A measure of injury severity will also be taken on patient admission using the Injury Severity Score (ISS). This study intends to recruit 30 patients admitted to Epworth Hawthorn Rehabilitation following multi-trauma orthopaedic injury.

Collaborating Organisations:
• Epworth Monash Rehabilitation Medicine Unit (EMReM)
• Epworth Rehabilitation, Hawthorn

Term: 05 August 2015 – 28 June 2017
[Registrar component completed with analysis of preliminary data; study continuing to reach anticipated sample size]

Investigating the outcomes of multi-trauma rehabilitation in a stand-alone facility compared to an acute hospital based rehabilitation facility

Investigators:
Babak Farr (PI)
John Olver
Bianca Fedele

Objectives:
This study will be a retrospective audit of routinely collected outcome data at Epworth HealthCare. The aim of this project is to investigate whether moving a multi-trauma rehabilitation unit from an acute hospital to a freestanding centre has impacted the patient outcomes of the rehabilitation program. The outcomes of interest include: – length of stay, changes in functional independence measures (FIM change), type of injuries and rates of transfer back to acute care. A secondary aim is to compare outcomes (namely length of stay and FIM change) at each site with benchmark and national averages.

Collaborating Organisations:
• Epworth Monash Rehabilitation Medicine Unit (EMReM)
• Epworth Rehabilitation, Richmond

Term: Completed (currently in the publication writing phase)
**Current PhD / Masters Research**

**Investigating the nature of the circadian sleep wake cycle and sleep architecture in patients in post-traumatic amnesia following traumatic brain injury**

**Investigators:**
- Bianca Fedele
- John Olver (PI)
- Dean McKenzie
- Gavin Williams
- Michelle Caldecott
- Robert Giles

**Objectives:**
Sleep disturbance is a dominant and disabling effect of traumatic brain injury (TBI). This condition manifests early in the acute TBI rehabilitation phase whilst patients are often in a temporary, confused state following loss of consciousness (designated post traumatic amnesia – PTA). A core feature of PTA are obvious alterations to the circadian sleep wake cycle resulting in poor quality, fragmented sleep and persisting sleep insufficiencies.

Sleep disruption causing excessive daytime drowsiness or night wakefulness can interfere with the demands of rehabilitation, limiting patient recovery and their return to pre-injury levels of function. In the scope of research and rehabilitation treatment, sleep disturbance during the acute PTA phase is often overlooked despite its modifiable nature, increasing prevalence and chronic repercussions (such as depression). This prompted a PhD study which adds new dimensions to PTA research including a greater understanding of the nature and markers of sleep disturbance which is currently absent and development of current treatment regimens that are not aligned with sleep disturbance. The primary aim of this study is to investigate the nature of the circadian sleep wake cycle and sleep structure of participants in PTA compared to the period after PTA has resolved, following a moderate to severe TBI. A secondary aim is to evaluate the occurrence of residual sleep disturbance (insomnia, daytime sleepiness) in the longer-term at 3 months post discharge and its relationship to emotional state (depression/anxiety).

**Collaborating Organisations:**
- Epworth Monash Rehabilitation Medicine Unit (EMReM)
- Epworth Rehabilitation, Richmond
- School of Clinical Sciences, Monash University (PhD)

**Term:** 13 March 2017 – 12 September 2023

**Developing a Sequential-Relational Model of Compassion**

**Investigators:**
- Debbie Ling
- Melissa Petrakis
- John Olver

**Objectives:**
Compassion is a value that is commonly cited by hospitals, schools and charitable organisations. The research literature on compassion refers to it as a “sense of concern that arises when we are confronted with another’s suffering and the motivation to see that suffering relieved.” Compassion training programs have been offered to healthcare professionals, schools and the general public in some overseas countries. Despite this growth in interest in compassion and compassion training programs, there is no clear agreement in the research community as to what compassion is, how it works, whether it can be trained and how to measure it.

This research aims to develop a model which explains how compassion comes into being. It is hypothesized that the perception of common humanity is the core process in compassion.

**Collaborating Organisations:**
- Monash University (PhD)
- Epworth Monash Rehabilitation Medicine Unit

**Term:** 30 March 2016 – 29 March 2020

**Olfactory Impairment following Traumatic Brain Injury: The incidence, recovery and consequences over time**

**Investigators:**
- Melanie Drummond (PI)
- John Olver
- Jacinta Douglas

**Objectives:**
- To identify the incidence of Olfactory Impairment (OI) (as measured by the Pocket Smell Test – PST and the University of Pennsylvania Smell Identification Test – UPSIT) following traumatic brain injury (TBI) in a consecutive sample of adults admitted to the Brain Injury Rehabilitation Program at Epworth Hospital, Richmond Campus in Victoria, Australia
- To investigate the natural progression of olfactory dysfunction following TBI in the context of recovery (6 + 12 months post injury)
- To identify acute factors that are associated with long term olfactory outcome
- Completion of the study will also facilitate the development of a practice recommendations to facilitate reliable screening for the presence of olfactory impairment in individuals who have sustained a traumatic brain injury (TBI).

**Collaborating Organisations:**
- Epworth Monash Rehabilitation Medicine Unit (EMReM)
- La Trobe University (PhD)

**Term:** 27 May 2009 – 9 June 2017
Participation at school following TBI

Investigators:
Margaret Mealings (PI)
Jacinta Douglas
John Olver

Objectives:
The aim of this research project is to explore the perspectives of students returning to study following brain injury, in particular to explore the impact on their sense of self and well-being in the context of their school participation. The project will be a longitudinal, mixed methods study engaging with participants over a period of 2 years.

Collaborating Organisations:
- Epworth Monash Rehabilitation Medicine Unit (EMReM)
- Health Sciences at La Trobe University (PhD)

Term: 1 January 2009 – 18 January 2018

Safe return to high-level mobility and cardiovascular exercise after traumatic brain injury

Investigators:
Sara Aldous
Associate Professor Gavin Williams (PI)
Professor John Olver
Associate Professor Jennifer McGinnley

Objectives:
Traumatic Brain Injury (TBI) is the leading cause of disability in young Australians aged 18–45. It is well documented that these young survivors of TBI are less active than their peers. Physical inactivity increases the risk of developing comorbidities such as cardiovascular disease, type-2 diabetes and psychosocial problems. Higher levels of mobility and improved cardiovascular fitness have been shown to be associated with higher community participation and quality of life. Although guidelines recommend people maintain an active lifestyle, no timeframes or criteria have been established for safe resumption of physical activity following TBI. This project plans to develop implementation recommendations for resumption of physical activity after TBI.

Collaborating Organisations:
- Epworth Monash Rehabilitation Medicine Unit (EMReM)
- The University of Melbourne (MPhil)

Term: November 2014 – November 2020

To what extent do healthcare built environment physical features have an effect on the physical, social and emotional well-being of acute neurological patients?

Investigators:
Michelle Shannon (PI)
Marie Elf
Prof Julie Bernhardt
Prof Alan Pert
Dr Marcus White
Prof John Olver

Objectives:
The design of healthcare physical environments is considered important in the recovery of patients. Increasingly, the content and spatial locations of physical environment design features are purported to enhance patient health and well-being in hospital. Now interest has focused on determining the scientific basis underpinning physiological, psychological and physical effects of the physical environment on neurological patients while in hospital care. This PhD will extend the scientific understanding of physical environment design features in neurological patient recovery. The primary purpose is investigating to what extent the physical environment has an effect on the physiological, physical, social and emotional health of neurological populations.

Collaborating Organisations:
- Epworth Monash Rehabilitation Medicine Unit (EMReM)
- The University of Melbourne

Term: November 2016 – (approx.) November 2020

Critical evaluation of spasticity assessment using the Modified Tardieu Scale

Investigators:
Megan Banky (PI)
Assoc. Prof Gavin Williams
Prof John Olver
Dr Ross Clark

Objectives:
This project aims to investigate the inter and intra rater reliability of testing speed and the ecological validity of the Modified Tardieu scale, a clinical outcome measure used to assess lower limb spasticity. It will also evaluate which component of the assessment has the greatest relationship with walking performance following injury to the central nervous system (CNS). The primary aim of this research project is to: establish the ecological validity of the Modified Tardieu scale as a clinical measure of lower limb spasticity for walking following injury to the CNS.

The secondary aims of this project are to:
- Trial a range of low cost and innovative assessment technologies (including Smartphone’s and the Microsoft Kinect) to determine their accuracy and practical application for assessing spasticity in the clinical setting following injury to the central nervous system;
- Determine whether real time feedback and a controlled testing velocity using these assessment tools can improve testing performance;
• Develop and freely disseminate any software applications which enable clinicians to complete the Modified Tardieu scale quickly and accurately in a clinical setting; and
• Investigate the correlation between each aspect of the Modified Tardieu scale (Tardieu score, angle of muscle reaction and spasticity angle) mobility performance and functional mobility categories.

Collaborating Organisations:
• Epworth Monash Rehabilitation Medicine Unit (EMReM)
• The University of the Sunshine Coast (PhD)

Term: 1 August 2015 – 1 August 2021

Upper limb associated reactions in people with acquired brain injury: Developing a dynamic assessment and investigating related impairments

Investigators:
Michelle Kahn (PI)
Dr Ross Clark
Assoc. Prof Gavin Williams
Ms Kelly Bower
Prof John Olver
Mr Benjamin Mentiplay

Objectives:
The arm is commonly affected in people with mild through to severe ABI. These people exhibit abnormal, involuntary arm movements, characterised by a flexed, “spastic” positioning, particularly when they exert effort. These aberrant arm movements are called associated reactions (ARs). They create many negative physical effects including reduced balance and walking efficiency, and limited arm use. This awkward arm posture has obvious aesthetic issues adding to the stigma of disability. These factors contribute to reduced physical activity and community integration. Treatment of ARs is a common goal of neuro-rehabilitation. Clinicians need to assess changes in ARs with treatment. However, controversy exists over the causes and best treatment approaches because currently there is no gold-standard method to assess ARs. The aim of this study is to use innovative technologies to develop and evaluate an ecologically-valid, objective assessment of ARs of the arm during dynamic and functionally provocative tasks, such as walking.

We will use the criterion-reference three dimensional motion analysis (3DMA) and the low-cost clinical alternative, the Microsoft Kinect, to develop an Associated Reaction Movement Score (ARMS). The ARMS, is a composite score encompassing the kinematic movements of the major joints of the arm during walking. It is a clinical index used to describe overall arm AR pathology during walking. We will also utilise other assessment methods for ARs including; a low-cost surface electromyography (SEMG) device to measure ARs during dynamic gait, the stationary-seated maximal voluntary contraction test that is commonly used in the literature, the subjective Associated Reaction Rating Scale and a basic two-dimensional elbow angle. We will investigate the clinimetric properties of these tests looking at their discriminability, concurrent validity, reliability and responsiveness. The final study related to this thesis will perform a preliminary investigation into the clinical impairments and factors contributing to ARs of the hemiplegic upper limb in people with ABI. This thesis will provide an extensively researched dynamic measure of ARs and provide some preliminary insight in the factors that clinicians should prioritise in their assessment and intervention for people with ABI who have an AR in their hemiplegic upper limb. It will then inform future research to further expand on this including interventional studies to inform clinical practice.

Collaborating Organisations:
• Epworth Monash Rehabilitation Medicine Unit (EMReM)
• The University of the Sunshine Coast (PhD)

Term: Completion date August 2020

Current Clinical Research Projects

Establishing of a Database from Epworth HealthCare’s Rehabilitation Concussion Clinic

Investigators:
John Olver (PI)
Joanne Sherry
Rose Acher
Bianca Fedele
Harvey Jones
Melinda Frith
Megan Hamilton
Christopher Byrne

Objectives:
• With increasing public awareness of concussion (particularly relating to sporting injuries) and the dearth of literature describing outcomes from concussion management; this prompted the establishment of Epworth HealthCare’s Concussion clinic. This clinic is an assessment and treatment program provided by a multidisciplinary team (rehabilitation physician, psychologist, physiotherapist, occupational therapist and exercise physiologist).
• The Clinic uses standardized assessment tools (e.g. Post-Concussion Symptom Checklist) to record and rate common symptoms experienced post-concussion and after intervention. These measures will be administered at each patient visit into the clinic to ascertain improvement or changes in outcome. This data will be entered into an electronic database to measure the effectiveness of the intervention offered.

Collaborating Organisations:
• Epworth HealthCare
• Epworth Monash Rehabilitation Medicine Unit (EMReM)

Term: 1 June 2016 – 1 June 2021
We are EPWORTH

Retrospective Audit of Medication Use in Patients who have suffered Traumatic Brain Injury and have been admitted to the ERR Traumatic Brain Unit Rehabilitation Unit

Investigators:
John Olver (PI)
Rose Acher
Bianca Fedele

Objectives:
The aim of the present study is to rationalize the use of medication and review practice in line with evidence-based guidelines. Francisco et al. (2007) reported that for neurobehavioral impairments post traumatic brain injury (TBI) randomised control trials do not exist for every scenario and therefore consensus and best practice guidelines are needed. Therefore, the use of medication and practice will be measured against Francisco et al. report of current medication preferences for managing neurobehavioral sequelae of TBI. An additional aim is to utilize the database as a teaching tool regarding medication use post traumatic brain injury. This may result in a reduction in the use of potential harmful psychoactive drugs in patients with traumatic brain injury.

Collaborating Organisations:
• Epworth Monash Rehabilitation Medicine Unit (EMReM)
• Epworth Rehabilitation, Richmond

Term: 24 November 2010 – 24 November 2018

An International, Multicentre, Observational, Prospective, Longitudinal Cohort Study to Assess the Impact of Integrated Upper Limb Spasticity Management Including the Use of BoNT-A Injections on Patient-centred Goal Attainment in Real Life Practice (ULIS III)

Investigators:
John Olver (PI)
Rose Acher
Stephen de Graaff
Marina Demetrios
Bianca Fedele

Therapists: – Gavin Williams, Jen Alford, Elizabeth Moore, Tim Roocke, Michelle Kahn, Megan Banky, Belinda Cranwell, Delia Naughton

Objectives:
Upper limb international spasticity [ULIS] III is the third stage of the ULIS programme which describes current clinical practice in real life spasticity management, including injection of botulinum toxin [BoNT- A]. The aim of the ULIS programme is to translate current practice into best practice. A series of observational studies within the ULIS programme will help to identify best practice strategies in spasticity management and to relate these to patient centred and functional outcomes. The primary objective of the study is to assess the longitudinal attainment of patient centred and function related goals after BoNT-A injection (including following repeated injection cycles where these occur) alongside integrated spasticity management used in real life settings over 2 years.

Collaborating Organisations:
• Epworth HealthCare
• Epworth Monash Rehabilitation Medicine Unit (EMReM)

Term: 1 November 2014 – 1 November 2018

The use of a Post Stroke Checklist (PSC) to identify persistent long-term problems amongst post stroke survivors

Investigators:
John Olver (PI)
Judith Frayne
Richard Gerraty
Bianca Fedele
Dr. Brinda Thirugnanam
Kelly Bertram/Jorge Zavala

Objectives:
This research project aims to identify the frequency of commonly reported long-term problems in Australian stroke survivors using a scale known as the Post Stroke Checklist (PSC). The PSC consists of 11 long term issues that patients can experience post stroke [e.g. pain, mood, cognitive, communication etc.] and identifies the appropriate course of action for each issue. The PSC has been designed to identify common long-term issues and enable a more appropriate mechanism for care for post stroke survivors. A secondary aim is to determine patients’ overall satisfaction with the PSC. This study intends to recruit 300 patients who were admitted to the Acute Stroke Unit at the Alfred Hospital or the Acute Stroke Program at Epworth HealthCare.

Collaborating Organisations:
• Epworth HealthCare
• Epworth Monash Rehabilitation Medicine Unit (EMReM)
• The Alfred Hospital

Term: 27 March 2014 – 27 March 2018

To Establish a Database Recording Patient Outcomes Post Botulinum Toxin Injection for Spasticity from Chronic Neurological Conditions

Investigators:
John Olver (PI)
Stephen de Graaff
Bianca Fedele

Therapists [Gavin Williams, Elizabeth Moore, Tim Roocke, Jen Alford, Michelle Kahn, Carly McKeough, Megan Banky, Belinda Cranwell]

Objectives:
The present study has collected data since September 2009 when the Spasticity Clinic commenced. The Spasticity Clinic runs bi-weekly where patients are reviewed and evaluated. Treatment is then initiated which may involve physiotherapy, occupational therapy, splinting or the use of Botulinum Toxin if spasticity is seen to be a significant problem. Patients are then reviewed at 8 weeks after the treatment starts to determine their response and measure their outcomes.
Baseline and follow-up data are collected through the Spasticity Management Clinic form which is as per normal patient evaluation. The study aims to optimize treatment protocols including muscle selection and dose ranges to achieve better outcomes and greater goal achievement for patients. It also aims to use the database to refine outcome measures of function post Botulinum Toxin injection.

**Collaborating Organisations:**
- Epworth HealthCare
- Epworth Monash Rehabilitation Medicine Unit (EMReM)

**Term:** 24 November 2010 – 24 November 2018

**The InTENSE trial: optimising upper limb recovery following stroke**

**Investigators:**
Natasha Lannin (PI)
John Olver

**Objectives:**
It has been more than a decade since studies showed that greater intensity of arm rehabilitation improves dexterity, yet Australian rehabilitation for patients with spastic, non-functional arm after stroke is anything but intense. For outpatients, usual rehabilitation in Australia is to attend a ‘Spasticity Clinic’ where they receive botulinum toxin (BoNT-A) injections to reduce their spasticity, but rarely receive any rehabilitation therapy. The aim of this study is to compare the clinical benefits of providing evidence-based movement training after BoNT-A injection to BoNT-A alone. The study will use a multi-site, assessor-blinded randomized controlled trial design. A total of 180 participants post stroke will be recruited and randomly allocated to either the experimental group (evidence-based therapy package after their BoNT-A injections) or the control group (Clinic BoNT-A injections alone). The study will use a multi-site, assessor-blinded randomized controlled trial design. A total of 180 participants post stroke will be recruited and randomly allocated to either the experimental group (evidence-based therapy package after their BoNT-A injections) or the control group (Clinic BoNT-A injections alone). Assessments include questionnaires about pain, quality of life, goals and functional movement of the arm and hand. Outcome measures will be obtained at baseline, 3 months (end of intervention) and 12 months (follow-up).

**Collaborating Organisations:**
- Epworth Monash Rehabilitation Medicine Unit (EMReM)
- Epworth Rehabilitation, Hawthorn

**Term:** 01 January 2015 – 01 January 2018

**Ballistic strength training compared with usual care for improving mobility following traumatic brain injury: protocol for a randomised trial**

**Investigators:**
Gavin Williams (PI)
Louise Ada
Leanne Hassett
Megan Morris
Ross Clark
Adam Bryant
John Olver

**Objectives:**
Mobility limitations are common following moderate to severe TBI, and may range in severity from interfering with basic day to day tasks to restricting participation in higher level involvement in social, leisure, employment and sporting activities. Despite the prevalence and severity of physical impairments such as poor balance and spasticity, the main contributor to mobility limitations following TBI is low muscle power generation. Strengthening exercises that are performed quickly are termed ‘ballistic’ as they are aimed at improving the rate of force production and hence muscle power. This approach is novel in that it trains the muscles to contract quickly which is exactly what is required during walking and stair climbing. We have demonstrated that ballistic strength training is safe, feasible and associated with a 60–74% increase in peak power generation. This is compared with conventional strength training which is performed slowly and aims to improve maximum force production, but has limited impact on mobility. This is a prospective, multi-centre, randomised, single blind trial of a 12-week program, investigating the effect of ballistic training during the early phase of rehabilitation.

The specific research question is, in people acutely recovering from TBI, is a 12-week ballistic strength training program targeting the three muscle groups critical for walking more effective than usual care at increasing strength and balance, improving mobility, and does improved mobility translate to better health-related quality of life? Participants will be recruited from brain injury units of large metropolitan hospitals. Participants will be randomised using concealed allocation to the experimental group (ballistic strength training) or the control group (usual physiotherapy intervention). The groups will be dose matched, i.e., they will receive equivalent therapy time, and will also continue with their usual rehabilitation. The primary outcome is mobility, measured using the High-level Mobility Assessment Tool (HiMAT) 3 months after cessation of the intervention (6 months). Outcomes will be measured at baseline (0 months), after completion of the 12-week intervention phase (3 months), and 3 months after cessation of intervention (6 months).

**Collaborating Organisations:**
- Epworth Rehabilitation
- Royal Automobile Club of Victoria
- National Health and Medical Research Council Fellowships
- Epworth Monash Rehabilitation Medicine unit (EMReM)

**Term:** 2016 – 2019
Establishing the Impact of Health Literacy on Patient Rehabilitation Outcomes Following Hip and Knee Joint Replacements

Investigators:
Frances Wise [PI]
John Olver

Objectives:
Health Literacy (HL) is defined as the ability to find, understand and use health information and is a strong predictor of health outcomes and behaviours. Low HL has been linked with longer hospital length of stay, anxiety, poorer health status, poorer physical function and adherence to treatment, and greater pain and fatigue. However, little is known about the HL status of patients undergoing rehabilitation following hip or knee joint replacements, or the impact of HL on functional outcomes. This study aims to describe the health literacy profiles of patients undergoing rehabilitation following hip or knee joint replacements. A secondary aim is to examine the impact of HL on patient outcomes including functional status, joint range of motion, length of stay, pain, fatigue, depression, anxiety and quality of life.

Collaborating Organisations:
• Epworth Monash Rehabilitation Medicine unit (EMReM)
• Epworth Rehabilitation

Term: 15 September 2015 – 31 December 2018

Professional Quality of Life and Compassion Fatigue in Rehabilitation Clinical Staff

Investigators:
Frances Wise [PI]
John Olver

Objectives:
Numerous studies have documented the fact that health professionals are at risk of developing "Compassion Fatigue" (CF). Compassion fatigue (CF) is defined as the loss of work-related satisfaction, or when the job brings more distress than satisfaction (Stamm, 2010). It is particularly recognised to occur in workers who practise compassion in situations with extended exposure to the suffering, both physical and emotional, of others (Radey & Figley 2007, Boyle 2011). Health care workers are obviously at such risk. The symptoms of CF are varied and include sadness, depression, anxiety, intrusive images, flashbacks, numbness, avoidance behaviours, cynicism, poor self-esteem, and survivor guilt. Compassion fatigue reduces productivity and staff morale, increases staff turnover and sick days (absenteeism), and leads to patient dissatisfaction and risks to patient safety.

However, levels of CF in health professionals working in rehabilitation is unknown, even though these workers are exposed daily to the suffering of patients with impairments and disabilities. It is also unknown what relationship CF in rehabilitation professionals may have to depression, anxiety and coping with stress. The aim of this project is to identify the level of Compassion Fatigue in rehabilitation health professionals and examine its relationship with other factors including age, sex, anxiety, depression and coping style.

Collaborating Organisations:
• Epworth Monash Rehabilitation Medicine unit (EMReM)
• Epworth Rehabilitation

Term: 26 August 2015 – 01 October 2016
“We traditionally work in teams,” Epworth Director of Rehabilitation, Professor John Olver AM, says.

“When I was first appointed the Victor Smorgon Chair of Research, I said from the outset [research] was not just going to involve doctors; it was also going to be physiotherapists, social workers, speech pathologists, research assistants and psychologists, amongst others,” John says.

That teamwork ethos applies equally to research work undertaken through Epworth Rehabilitation.

“We have a full multidisciplinary team of researchers currently obtaining their PhDs. This is in many ways possible because of Epworth’s teaching and research imperative. The hospital’s desire to grow in these areas, to the benefit of our patients and staff, has allowed many unique projects to develop,” John says.

John, together with fellow researcher and Physiotherapist, Associate Professor Gavin Williams, currently co-supervise six postgraduate students completing studies into areas such as concussion and spasticity. Partnerships exist for postgraduate rehabilitation students from LaTrobe University, Monash University and The University of Melbourne.

The long-term collaboration between John and Gavin is fuelled by the common goal of improving patient care – and of involving patients in research impacting that care.

One current study, conducted by PhD student, Margaret Mealings, and co-supervised with LaTrobe University, examines the student experience returning to study after a traumatic brain injury (TBI).

“Margaret’s doctoral project focuses on the student’s perspective of their treatment and how they have reintegrated back into an educational environment,” John says.

“There are a lot of theories about how a student should be returned to study, but in all of the early literature no one has bothered to ask the patient what worked for them; how did they feel? A lot of our patients lose self-esteem as a result of their brain injury, so they go back to school not feeling very confident.

“They may find that their friends are not as tolerant as they could be and that teachers and other pupils don’t understand what is happening for them. They often find it
tough going after a while. They also remember what they were like before the accident, and they’re coming up maybe a bit short in terms of the marks they are getting, their self-confidence, their motivation and their goals.

“They begin to wonder whether they will be able to get into university or, if they are already there, whether they will finish, go on to a higher degree or transition into work,” John says.

Epworth’s concussion clinic has also provided a rich patient database, to enable researchers to monitor ongoing symptoms of post-concussion syndrome.

“For patients who get concussed on a football field, for instance, 80 per cent of those will be symptom-free in two weeks. Whilst we get to see a few of those cases, it’s the ones who have symptoms for several weeks or several months that we see the most. With the therapy Epworth offers, we can turn off most of those symptoms and get patients back to their normal lifestyle more quickly,” John says.

“Physically, we normally treat neck problems or headaches resulting from a head injury, plus dizziness and vertigo, which is a very troubling symptom after you’ve had a head injury. We’ve got a physiotherapist on the team who is an expert in vertigo and neck problems, and the second member of the team is a neuropsychologist/clinical psychologist who looks at the anxiety, depression and irritability [that is] very common after a mild head injury as well.

“Through [the concussion clinic’s] database, we are able to monitor the accuracy and efficacy of a symptom checklist we give to patients when they start therapy. They rate their symptoms between zero and six, we treat them, then we give them the checklist again and hopefully the symptoms are now rated as ones or zeros,” John says.

In 2017, John’s team received a $70,000 Epworth Research Institute [ERI] Strategic Grant, funded through the Epworth Medical Foundation [EMF], and a further $50,000 from a charitable trust, to fund a concussion study involving the Epworth Richmond Emergency Department.

All patients presenting at the emergency department with a head injury will be given the concussion symptom checklist. A program will then be established where a doctor will review the patients at the four-week mark.

“If their symptoms are severe whilst in emergency, they will be sent straight to the concussion clinic. If the symptoms are mild and likely to get better, they’ll be sent home with some advice but will have a follow up at four weeks with someone who will redo the checklist with them. Some of those patients will not be getting better and will need to come to the clinic,” John says.

Improving the diagnosis and treatment of spasticity — excessive tightness or stiffness in muscles — is another key area of focus for John and Gavin.

Gavin says, “Physiotherapist, Elizabeth Moore, has just completed her Masters project through Epworth and The University of Melbourne, looking at what therapies patients should complete after an injection of botulinum toxin [Botox] for spasticity. It’s not immediately clear at the moment what those therapies should be. It’s recommended patients experiencing spasticity complete some form of occupational therapy (OT) or physiotherapy but it is not clear what type of OT or physio is best.

“Previous studies have looked at a single treatment in isolation, and that’s not how rehab works — it is a package of care. Liz was looking at how effective rehab is in spasticity patients, if it is delivered as it normally would be, and whether different people with different presentations of spasticity benefit more from rehabilitation. In other words, who benefits most from rehab, and how much they should have.”

Gavin has also worked with PhD student Megan Banky on a series of four studies over the past couple of years, looking at spasticity and walking.

“The current belief is that spasticity is the main barrier to walking in patients and that is what we need to treat if they are to improve mobility. It now appears that while it is a problem, it’s not a matter of simply injecting them with botulinum toxin and they will instantly walk better. Rather, Megan found injecting the patient will facilitate the strength training necessary for them to walk better,” Gavin says.

“[This] has changed our thinking and our approach to the problem of mobility — that maybe spasticity is not the main problem, but just one issue we need to address to deliver more effective therapy.

“The main issue relating to this is how we test muscles to decide whether we should inject them or not. The way we test muscles prior to injection doesn’t actually reflect how the muscles work during walking. Megan’s PhD is examining how, if we standardise the testing to reflect muscle function for walking, we’re going to get a different result.

“It does seem strange that this issue has been around for 50 years and no one has thought to look at it in this way,” Gavin continues, “but it is a very strongly-held belief that spasticity is the main problem requiring treatment in patients with mobility issues. It’s not easy to let go of that belief.”

Epworth’s new spasticity clinic — predominantly outpatient — is a truly interdisciplinary clinic, and has provided a second database to facilitate patient research.

John says, “When I am treating a patient, I’ve got a physio and an OT in the room. We do the assessment together and then decide on the treatment. We then review. When we started the spasticity clinic we set up a database, approved by the human research ethics committee, collecting outcome data on every patient.

“As with our concussion database, this [database] allows us to monitor the success of our goal- setting with patients. In other words, we say to patients that if we inject a muscle and reduce the tightness, they should be able to do the task that they want to do. But it’s a bit unpredictable. We want to see how good we are at setting goals with patients and how effective the treatment is.”
Monash Epworth Rehabilitation Research Centre

PROFESSOR JENNI PONSFORD AO

Strategic vision

The aim of the Monash-Epworth Rehabilitation Research Centre (MERRC) is to conduct ethical, innovative and internationally competitive research investigating outcomes and the effectiveness of intervention programs for individuals with brain injury or other injury sustained as a result of trauma, with the ultimate aim of maximising their functional, psychological and social outcomes.

Overview

The Centre was established in 2000, following the appointment of Professor Jennie Ponsford AO to the School of Psychological Sciences at Monash University, bringing together the resources and expertise of Monash University with that of Epworth HealthCare, which runs rehabilitation programs for victims of trauma. It has been self-funding since its inception. The Transport Accident Commission (TAC) has been the largest financial supporter of the Centre, having provided substantial funding for the Longitudinal Head Injury Outcome Study and associated projects over 22 years.

The MERRC is directed by Professor Ponsford. Dr Adam McKay, Dr Rene Stolwyk, Dr Catherine Willmott, Dr Dana Wong, Associate Professor Dean McKenzie, Associate Professor Gavin Williams, Dr Pamela Ross, Professor John Olver AM, Dr Michael Ponsford, and Dr Rose Acher from Epworth/Monash are active academic and clinical researchers within the centre.
Collaborators

Professor Ponsford and the MERRC team have many productive research collaborations, within Monash University and at Alfred Health, NTRI, Florey, TAC, ISCRR, Phoenix Australia, the Australian Football League (AFL) Monash Health, Austin Health, and the Victorian Stroke Clinical Network. The MERRC team collaborates with international experts from TIRR Memorial Hermann and Baylor College of Medicine in Houston, USA, Harvard University in Boston, University of Ottawa, Canada and Maastricht University, Netherlands. Professor Ponsford is also a visiting Professor at Sunnaas Rehabilitation Hospital in Oslo, Norway.

Project synopsis

The following projects are currently in progress or have been completed in the FY16/17.

Longitudinal Head Injury Outcome Study

Traumatic brain injury is the leading cause of acquired disability in young people, resulting in a complex range of physical, cognitive, behavioural and emotional changes. The elucidation of the long-term problems experienced by those who sustain traumatic brain injury owes much to the Longitudinal Head Injury Outcome Study, which has been conducted at Epworth Hospital (formerly Bethesda) since 1995 and has 23 years of funding form TAC exceeding $5 million. After recruitment as inpatients, all patients admitted to Epworth Hospital with head injuries are routinely invited to complete follow-up at 1, 2, 3, 5, 10 and 20 years post-injury. They are interviewed by a rehabilitation physician or research unit clinician and complete questionnaires documenting their level of mobility, functional independence, living situation, relationship status, vocational activities, neurological, cognitive, behavioural and emotional problems experienced and drug and alcohol use. The study has provided comprehensive information regarding the difficulties experienced by these individuals and their families over long periods of time after injury. Findings have been published in over 100 international peer-reviewed journal articles, and in over 120 national and international conference presentations. This is one of the most comprehensive longitudinal databases worldwide.

Return to Work following Traumatic Brain Injury

This study aims to document the processes of return to work, identify factors which contribute to employment outcomes and examine from a qualitative perspective the lived experience of patients with Traumatic Brain Injury (TBI) who have participated in the Return to Work program at Epworth Healthcare. Recruitment is underway.

Light therapy for fatigue following traumatic brain injury

This novel study is the first randomised controlled trial of a non-pharmacological treatment for post-TBI sleepiness and fatigue, and builds on our previous successful trial showing morning exposure to short wavelength light reduced fatigue and daytime sleepiness following traumatic brain injury. This study will utilise in home light therapy in TBI patients, where the lighting will be permanently fitted within the participants’ homes, with no requirement to actively attend to the light intervention. Recruitment is underway.

Comparing restorative and compensatory approaches to remediation of memory impairments following brain injury

This study aims to compare the efficacy and cost efficiency of computer-based training versus compensatory memory rehabilitation approaches with regard to ameliorating 1) memory impairment and 2) activity limitation in patients with acquired brain injury (ABI). We have been conducting a pilot randomised controlled trial to compare (A) computer-based memory training (LumosityTM) and (B) compensatory memory rehabilitation (Memory Skills Group). Recruitment and data collection have been completed and data analyses are underway.

Sexuality Following Traumatic Brain Injury

As part of the longitudinal head injury outcome study we have surveyed patients at 1, 2, 3, 5, 10 and 20 years post-injury, aiming to identify the nature and frequency of changes in sexual behaviour, affect, self-esteem and relationship quality, and their interrelationships and changes over time. We have validated a scale to assess these aspects of sexuality in individuals with TBI, the Brain Injury Questionnaire on Sexuality. Factors predicting these problems have been identified, as a basis for the development of interventions, with the results of these studies published in the Journal of Head Trauma.

Investigation of Substance Use Following Traumatic Brain Injury

The aims of this study were to examine pre-injury drug and alcohol use compared with the healthy population, and to investigate the development of alcohol and drug use over
time following injury. This included the identification of variables that predict drug and alcohol use. The results of this study have been published in Brain Injury.

**Psychiatric Disorders Following Traumatic Brain Injury**

The aim of this project has been to prospectively examine the frequency, course, and predictors of psychiatric disorders over the first ten years following TBI. Further, as the impact of a TBI extends beyond the injured individual, a secondary aim has been to examine the influence of family dynamics on both patient and family psychosocial adjustment following TBI. Recruitment and data collection for the ten year outcomes in particular are underway. Analyses of the time-course of psychiatric disorders and associated costs of mental health care have been conducted in collaboration with TAC, using the Compensation Research Database.

**The influence of genetic factors, specifically the Apolipoprotein gene, and age at injury on outcome following head injury**

This study aims to examine whether possession of the Apolipoprotein E 4 allele is associated with greater acute injury severity and poorer long-term outcome in patients referred for rehabilitation following TBI. We are also investigating the impact of catechol-O-methyltransferase (COMT Val158Met) allele status on cognitive and functional recovery following TBI, with a recent publication in the Journal of Neurotrauma on this subject.

**The influence of cultural background on rehabilitation following traumatic brain injury**

This study aims to examine the influence of linguistic cultural background, and beliefs about injury and recovery on participation in rehabilitation and subsequent outcomes in two groups with mild-severe TBI, one of English speaking background (ESB) and another of culturally and linguistically diverse background (CALD). As the cohort grows in size we also aim to differentially compare groups from different countries. Results for this study have been published in several journal articles, with further recruitment and data collection ongoing.

**The return of memory following traumatic brain injury–The critical role of the medial temporal lobe, prefrontal cortex, and associated brain areas**

Post traumatic amnesia (PTA) is a hallmark period following TBI that is characterised by profound memory impairment. This study has two aspects. The first examines patterns of recovery of memory during and after emergence from PTA, as well as the relationship between anterograde and retrograde amnesia in individuals with TBI. The second pilot project aims to identify the brain regions and networks implicated in impaired memory in patients with traumatic brain injury during PTA using fMRI and to examine changes in BOLD activation in specific brain structures or networks that may modulate the recovery of memory following PTA. Recruitment and data collection are underway, with three papers in preparation/submission.

**Efficacy of early therapy for patients in post-traumatic amnesia**

The main aim of this three-year study, funded by the Epworth Foundation and ISCRR, was to assess the efficacy of ADL retraining during the PTA phase after severe TBI (treatment group), as compared to introducing ADL retraining after emergence from PTA (treatment as usual control). A separate component of this study examined agitation during post-traumatic amnesia, its evolution and association with cognitive function and fatigue, its impact on therapy and the experience of nurses caring for these patients. Findings support the efficacy of early therapy in enhancing functional independence in the acute stages of recovery from TBI without causing agitation. Two papers have been accepted for publication on this topic and translation of study findings is underway.

**Efficacy of melatonin for sleep disturbance following traumatic brain injury**

This study, funded by an NHMRC Project grant, was the first randomised controlled trial of Melatonin for sleep disturbance following TBI aiming to identify whether patients who receive Melatonin therapy show reduced latency to sleep onset, and improved sleep quality. If Melatonin therapy is successfully shown to improve sleep, this could substantially improve the quality of life in TBI patients. Data analysis is currently underway following completion of the trial.

**Cognitive-behaviour therapy for fatigue and sleep disturbance following traumatic brain injury**

This study aims to evaluate the effectiveness of adapted Cognitive Behaviour Therapy (CBT) in alleviating fatigue and/or sleep disturbance following head injury. It has been funded by an Epworth Research Institute grant and some additional support from the NHMRC Centre of Excellence in TBI Psychosocial Rehabilitation, with three papers recently published. A Phase II trial, utilising an active control condition is underway.

**Safer Roads to Recovery: Assessing Readiness for Driving after Traumatic Brain Injury**

The aim of this study is to examine, objectively, the nature and causes of driving difficulties following TBI as a basis for developing more reliable and valid assessment procedures for readiness to return to driving and thereby improving the safety of drivers with TBI. A current pilot study also aims to evaluate the use of simulator training prior to on-road assessment, as a means of facilitating and improving their safe and successful return to driving.
**Understanding Behaviours of Concern following Traumatic Brain Injury**

The broad objective of the first phase of this project has been to identify the factors underpinning chronic behaviours of concern in TAC clients, as a basis for development and evaluation of a program to alleviate these behaviours, enhance client independence and participation and reduce costs. The second phase of this study aims to evaluate the efficacy of a Positive Behaviour Support intervention to examine its influence on behaviour change in individuals with TBI and any reduction in care costs. This is the largest RCT of a positive behaviour support intervention worldwide. The first phase of the study has been completed, with two papers published on this topic, while data collection for the second phase is underway.

**Singing my story: Negotiating identities through therapeutic songwriting for people with acquired neurological injuries**

The aim of this study is to determine whether participation in a songwriting program either early after injury or 6–18 months later, assists people to cope with living with an acquired brain injury or spinal cord injury to feel better about themselves. It aims to understand how songwriting impacts on wellbeing outcomes such as mood, identity, life-satisfaction, and coping. Data collection is ongoing.

**NET trial**

The aim of this knowledge translation project has been to evaluate the implementation of procedures to enhance screening of patients with mild TBI in a cluster randomised trial involving 31 hospital emergency departments around Australia. Specifically the trial aimed to implement use of the Abbreviated Westmead PTA scale to screen patients, use of guidelines to guide decisions regarding CT scanning and provision of an information booklet developed by Prof Jennie Ponsford to patients. The results of this study are currently being written up for publication.

**INCOG Study**

Although cognitive impairment presents the greatest impediment for people with a TBI, currently very little is known about current practice for cognitive rehabilitation in this group. Therefore, the INCOG study aims to characterise current cognitive rehabilitation practices via an online survey of therapists engaged in rehabilitation in individuals with TBI. Data collection has finished, with over 200 rehabilitation clinicians in Australia providing responses, and over 150 responses provided from overseas clinicians. The data regarding Australian responses are currently being written up for publication and will be submitted to the Journal of Head Trauma Rehabilitation.
Treatment for people with a traumatic brain injury (TBI) has improved significantly in recent decades. Medical intervention to alleviate immediate, life-threatening issues such as intracranial pressure, has saved many lives in the immediate aftermath of a serious head injury. However, it is the long-term effects of TBI that continue to impact patients’ lives, decades after leaving hospital.

Professor Jennie Ponsford AO, recently made an Officer of the Order of Australia for her pioneering work in neuropsychology and traumatic brain injury, has spent more than two decades working towards improving TBI patients’ quality of life.

Jennie formed the Monash Epworth Rehabilitation Research Centre in 2000. The centre conducts research into the consequences of brain injury and other forms of trauma, and develops interventions to improve outcomes. The centre currently supports 20 doctoral students.

“At the moment, we are working on a longitudinal head injury outcome study, which has been running since the late 1980s. We originally set it up to examine outcomes in our patients and see if we could improve those outcomes and identify the difficulties they experienced after returning to the community. The study has had 23 continuous years of funding from the Transport Accident Commission (TAC), which is wonderful,” Jennie says.

“The centre follows patients who come through the Epworth head injury unit at one, two, three, five, 10 and 20 years post-injury. We’ve got about 3000 patients in our database for this study, of whom about 2700 have been followed-up. It’s a really rich database from which to get an understanding of a recovery’s trajectory and to identify the key problems individuals with TBI face.

“We have identified a number of issues, including problems with fatigue, sleep disturbance, anxiety, depression, memory and attention. People with more severe head injuries commonly experience quite debilitating behavioural problems that can really impede their [re]integration into the community and their independence.

“We have gone on to develop rehabilitation interventions to try and alleviate these problems and are currently evaluating their efficacy. Sleep disturbance and fatigue have been a key focus of our work. We received an NHMRC grant
to study the nature of those disturbances in detail and we’ve also developed three intervention studies that are in various stages,” Jennie says.

As a result, Jennie and her team conducted a world-first randomised control trial into the use of melatonin to treat insomnia in people with head injuries.

“We’ve got about 3000 patients in our database for this study, of whom about 2700 have been followed-up...”

“Melatonin is a naturally occurring hormone that drives the onset of sleep. We found melatonin levels were lower in people with head injuries. The study treats people with melatonin for sleep disturbance and the paper we have just submitted for publication shows the melatonin does improve sleep quality, [and] reduce fatigue and anxiety levels in people with head injuries,” Jennie says.

“Light therapy is another treatment we have trialled with some success. People who are exposed to short-wavelength light become more aroused — it’s a bit like going outside in the sunshine, but this is more intense. We found that concentrating the light more results in reduced fatigue and daytime sleepiness, if people are exposed to light in the mornings.

“However, sitting in front of a light box for 45 minutes in the morning is a bit onerous, so we are now starting a trial of changing light bulbs in people’s homes. This will naturally expose [TBI patients] to this type of light while going about their normal business,” Jennie says.

“Sleep and fatigue problems are quite multifaceted in their causes, they are both due to organic, brain-related factors, but also [to] psychological factors like being depressed, anxious or having pain. We have also been doing cognitive behavioural therapy (CBT) for sleep and fatigue.

“We have evaluated that in a randomised control trial and again we have just published those findings, showing that an adapted form of CBT for those with cognitive difficulties — so with some repetition for people with memory problems and quite structured type of intervention — has also been helpful in reducing fatigue and sleep problems in both TBI and stroke patients.”

Epworth also sees many patients experiencing post-traumatic amnesia (PTA). These patients have experienced a TBI and come out of coma quite confused and disoriented. Managing those patients is quite a challenge as they are often agitated and confused. Traditionally, a rehabilitation team will limit the amount of therapy they ask the patient to do, often to just light physiotherapy.

“This is a pattern of treatment that has slowly developed over the years, however there hasn’t been any scientific evidence to guide us in knowing whether patients could benefit from therapy during this phase of recovery,” Jennie says.

Her team has undertaken another world-first randomised control trial, looking at occupational therapy in daily living activities while the patient is still experiencing PTA. Patient outcomes — including daily living and independence, length of stay in hospital and the length of the confused phase — were then assessed.

“The trial showed patients can benefit from therapy during that phase. There is a trend towards shorter length of stay in hospital, so that’s quite a significant finding in that it will change rehabilitation practice at Epworth,” Jennie says.

As a result of the trial, allied health staff at Epworth will begin initiating therapy during the PTA phase. Jennie and her team are running workshops around Australia to facilitate this, funded by the Institute for Safety, Compensation and Recovery Research (ISCRR).

A further study, also funded by the ISCRR, is addressing behavioural issues in TBI patients. Jennie says, “We have a whole team of therapists working with people out in the community, trying to create a more positive environment around these people, helping to minimise their behavioural problems.

“We are very focused on trying to create research that is going to make a difference for our patients. We want to provide the type of interventions that can be translated into new skills for staff to use every day."

Professor Jennie Ponsford AO is chair of psychology at the Epworth Monash Rehabilitation Research Centre; Jennie was awarded Researcher of the Year during Epworth Research Week 2017.
Neuroscience

Strategic vision

Neuroscience research at Epworth benefits from the large volume of neuroscience patients seen through the emergency department, their great willingness to participate in research projects and the generous collaboration of the emergency physicians, the neurologists and the neuroradiologists in these studies. This affords a unique opportunity for studying acute neurological disorders such as TIA and vertigo and transient global amnesia.

Overview

Epworth is a large private hospital with two full time onsite neurologists and a number of visiting neurologists, one other with rooms at Epworth and one with rooms nearby. The emergency department draws from all over Melbourne and the state and sees a mix of complex quaternary neurological disorder patients and a dwindling number of acute strokes from Ambulance Victoria with the advent of centralized endovascular clot retrieval at Royal Melbourne Hospital and now Monash Medical Centre.

Currently [2016/2017 financial year and ongoing] the research activities in neurology are driven by Professor Richard Gerraty. A grant from Perpetual covers the salary for an EEG scientist to assist with this study and a research officer will be recruited to assist in 2018. The Monash BMedSc(Hons) program from 2011–2016 was successful with all but one of six students gaining H1.

Vertigo research

The current main vestibular research project is supported by a grant from Perpetual Limited for a study looking at differentiating cerebellar stroke from more benign causes of vertigo. It utilises the GN Otometrics video head impulse testing equipment. We now have a large database of patients and controls, but recruitment of stroke patients has declined at Epworth with the advent of centralisation of endovascular clot retrieval for stroke in Melbourne.

We are one of only two or three groups in Australia doing this sort of research. Abstracts from the vestibular research have been presented at the recent Australian and New Zealand Association of Neurologists and the Neuro-otology Society of Australasia annual scientific meetings. These relate to mild vestibulopathy in older patients, which may have a vascular basis, and premonitory vertigo in vestibular neuritis patients which appears to be a feature of viral labyrinthitis in younger patients. Two papers are in preparation from this research, one now complete related to saccade latency [rapid compensatory eye movements] in vestibular neuritis recovery, first author Kunal Luthra.

Stroke research

The NHMRC sponsored STAND–FIRM secondary prevention stroke study in the Monash Department of Medicine, a study a nurse-led intervention to lower blood pressure, has been finished and this year a number of papers have come from that work.

The other NHMRC sponsored project, the T3 trial of triage, temperature control and thrombolysis in stroke is also now complete and the main paper is in preparation.

The TIPS study of thrombolysis implementation in which Epworth was a participating site has concluded.

The Cerebral Amyloid Angiopathy work from last year is being written up by the first class BMedSc(Hons) student who has also written and excellent review for publication. Further work in this area will be in collaboration with St Vincent’s Hospital which continues to see stroke patients.

At Epworth we participated in 2017 in the National Stroke Foundation institutional and Acute Stroke Audit. We are currently in negotiation with Epworth and the Florey Institute over whether we could contribute to AuSDaT, the replacement of AuSCR, the national stroke database.
Alzheimer’s disease research

A small phase 1 trial of a novel agent in Alzheimer’s was conducted in Australia at four centres in 2016–2017 with Epworth contributing significantly to the recruitment. Cognition Therapeutics’ drug CT1812 is a small molecule that competes for binding at a receptor on nerve synapses (junctions), preventing the binding of small groups of Alzheimer’s disease related beta A4 molecules that destroy synapses. Extension of the study is being considered, and if the results of this early phase study are satisfactory a larger study is envisaged in 2018.

Other Alzheimer’s trials are being considered by the Clinical Trials Unit. Private neurology rooms are the ideal recruiting ground for mild to moderate Alzheimer’s patients who are keen to be in trials and are much more likely to fulfil the stringent eligibility criteria than more advanced patients with multiple comorbidities and exclusionary concomitant medications.
Nursing

Strategic vision

The Epworth/Deakin Centre for Clinical Nursing Research is a joint initiative between Deakin University’s School of Nursing and Midwifery and Epworth HealthCare. The Centre was established in 2004 to conduct collaborative clinical research and provide staff and students the opportunity to engage in clinically focussed, multidisciplinary research and training across acute, rehabilitation and community healthcare settings.

The Centre provides academic and professional leadership to staff and students and recognises the importance of combining expertise from both industry and academia to inform the quality and safety of healthcare delivery. A defining feature of the Centre is that it fosters a rich diversity of activities in health services research with the aim of enhancing the research culture at Epworth with benefits for staff, academics, students and patients.

Overview

The four key objectives of the Centre are to:

1. Pursue a program of research that supports the core clinical activities of Epworth HealthCare and is situated within the Quality and Patient Safety (QPS) research cluster of the Faculty of Health, Deakin University.
2. Support Quality and Patient Safety activities at Epworth HealthCare through research translation.
3. Provide leadership and mentorship for the professional development of clinical and academic staff through research training and education.
4. Establish a public profile of the Centre that promotes its activities and research outcomes and highlights the expertise of its researchers as leaders in their field.

Current research activities

Critical Care
Prevalence, treatment and outcomes of delirium in ICU patients at Epworth Richmond National Standards 9
Ewers, Rebecca (Master of Nursing), Bloomer, M., Hutchinson, A. Epworth Richmond
Identifying which Emergency Department [ED] patients are more at risk of clinical deterioration and Medical Emergency Team (MET) activation. National Standards 9

Capabilities

A key objective of the Centre is to pursue a program of research that supports the core clinical activities of Epworth HealthCare and is situated within the Quality and Patient Safety (QPS) research cluster of the Faculty of Health, Deakin University.

Our three overarching research streams are:
1. Patient engagement and participation in healthcare
2. Patient experiences of care and recovery
3. Clinical support for delivery of high quality, safe care.

<table>
<thead>
<tr>
<th>Staff Member Name</th>
<th>Role/Position</th>
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<tbody>
<tr>
<td>Professor Mari Botti</td>
<td>Chair in Nursing</td>
</tr>
<tr>
<td>Associate Professor Ana Hutchinson</td>
<td>Deputy Director</td>
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<tr>
<td>Dr Rosalind Lau</td>
<td>Research Fellow</td>
</tr>
<tr>
<td>Damien Khaw</td>
<td>Research Fellow</td>
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<tr>
<td>Kath Colvin</td>
<td>Research Assistant</td>
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<tr>
<td>Teresa Redley</td>
<td>Executive Assistant</td>
</tr>
<tr>
<td>Dr Beverley Wood</td>
<td>Research Fellow</td>
</tr>
</tbody>
</table>
Schepers, Claire [Master of Nursing], Botti, M., Brooks, L. Epworth Geelong

Development and implementation of a cardiac cath lab specific pre procedure checklist National Standards 6
Tony, Anu, [Master of Nursing], Hutchinson, A., Ley, L. Epworth Geelong

Team Communication in the ED National Standards 6
Poon, Jeremy [PhD Candidate], Wickramasinghe, N., Botti, M. Epworth Richmond

Systematic Review of the evidence for APRV ventilation in improving ICU patient outcomes National Standards 9
Walsh, Debbie [Master of Nursing]. Hutchinson, A., Considine, J. Eastern Health

Evaluation of current practice in Australian ICU’s for the prevention and management of respiratory infections and prevention of Ventilator Associated Pneumonia in critical care patients National Standards 3
Campioli, N., [Master of Nursing], Hutchinson, A. Epworth HealthCare

General Medicine

Understanding end-of-life Care in the Subacute setting National Standards 1 & 2

Evaluation of the feasibility and patients of the New Dimensions Reconditioning Program Post Bariatric Surgery Restorative Care at Epworth Camberwell National Standards 2
Oliver, A., Jasper, A., Allen, S., Dandanis, I, Hooper, S., Hutchinson, A., Botti, M. Epworth Camberwell

National Standards

Factors that determine length of stay and readiness for discharge from the Post Anaesthesia Care Unit. A retrospective clinical audit. National Standards 6 & 9
Briggs, Karen [Master of Nursing], Street, MA., Botti, M. Epworth Eastern

The effects of prophylactic antibiotics on the incidence of surgical site infection among women after breast cancer surgery National Standards 3
Morrison, Sally [Master of Nursing], Hutchinson, A. Epworth HealthCare

Quantifying risk of Unplanned Transfer from subacute to acute care National Standards 9
Considine, J., Botti, M., Borg V., Hutchinson A. et al. Deakin University multi-site project. Epworth Camberwell, Hawthorn, Brighton, Deakin University

Exploration of patient experience across an admission trajectory National Standards 2
Brown, Elizabeth [BN Honours], Botti, M., Wood, B., Hutchinson, A. Epworth Eastern

Falls prevention in rehabilitation National Standards 10
Blatsis, Eirene [BN Honours], Redley, B., Botti, M., Hutchinson, A., Shkuratova, N. Epworth Brighton

An exploration of patients’ experience of point of care information technology [POC-HIT] in acute care National Standards 2
McNichol, Leigh [BN Honours], Hutchinson, A Epworth Richmond, Eastern

Patient and family experience of participation in inter-professional rounds on acute inpatient medical wards National Standards 6
Redley, B., McTier, L., Hutchinson, Ali., Botti, M. Alfred HealthCareMonash Health, Eastern Health

Oncology

Development of a smartphone App for carers of people with cancer National Standards 2
Heynsbergh, N. [PhD Candidate], Livingston, T., Heckel, L., Botti, M. Epworth Richmond

M-Health: Efficacy and cost-effectiveness of a smartphone App to reduce unmet needs and distress in people with cancer (ACE): a randomized controlled trial National Standards 2 & 9

Best practices for nursing care of inpatient radiotherapy patients National Standards
Hjorth, Margie [Master of Nursing], Botti, M., Redley, B., Cohen, E. Epworth HealthCare Richmond

Patient participation in symptom management in acute care settings: An international cohort comparison (pilot) study [PSAPP] National Standards 2 & 9
Cohen, E., [Post Doc], Livingston, T., Johnstone, M., Duke, M., Botti, M., Redley, B., Rasmussen, B. Epworth HealthCare Alfred Health Mahidol University, Thailand China

Surgical Cardiac

Systematic review of current best evidence for management of post-operative pain following cardiac surgery (requiring sternotomy) in the Intensive Care Unit National Standards 9
Tomlinson, Rose [Master of Nursing], Hutchinson, A. Epworth HealthCare

Radiologist decision making regarding pre procedure sedation for interventional cardiology procedures National Standards 4
Zinkel, Annika [BN Honours], Rolley, J., Botti, M., Redley, B. Deakin Honours Student
Surgical Orthopaedic

Multimedia (MyStay) Intervention for managing patient experience (MIME) following total hip replacement surgery: a cluster randomised trial National Standards 2 & 9

Translation of evidence into pain management practices in acute care environments (MAPP internal) National Standards 9
Botti, M, Reilly, S., Hutchinson, A., de Steiger, R., Donovan, S., Vawser, T. Epworth HealthCare

Reducing variation in acute pain management: A data-driven solution to improve uptake of a management algorithm for postoperative pain. (MAPP Multi Site) National Standards 9
Botti, M., Hutchinson A., Redley,B., Bucknall, T., Considine, J., Livingston, P. Epworth Western
Barwon Eastern, Monash, Alfred

Moving Venous Thromboembolism (VTE) assessment and detection to the forefront of nursing care National Standards 9
Keating Alanna [Master of Nursing], Hutchinson, A. Epworth HealthCare

Patient communication of pain in acute care contexts National Standards 2 & 9
Hunter, Susan [PhD candidate], Botti, M. Epworth HealthCare

Patient participation in postoperative care activities in patients undergoing Total Knee Replacement Surgery: Multimedia Intervention for Management Patient Experience (MIME) National Standards 2
Mc Donall, Jo [PhD candidate], Botti, M., Redley, B., de Steiger, R., Hutchinson, A., Livingston, P. Epworth HealthCare, Richmond

Workforce Development

Exploring the influence of different models of undergraduate nursing education on the work readiness of grad nurses at Epworth HealthCare National Standards 1–9
Dudley, Mietta [Master of Nursing], Hutchinson, A. Epworth HealthCare

<table>
<thead>
<tr>
<th>Student Name</th>
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<th>Thesis Title</th>
<th>Start Date</th>
<th>Expected or Actual Completion Date</th>
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<td>Beddoes, Lenore</td>
<td>PhD Candidate</td>
<td>Evaluating the quality of 24-hour acute care delivery: Describing functional outcomes of older people using a model of best practice</td>
<td>2006</td>
<td>PhD awarded April 2017</td>
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<td>Blatsis, Eirene</td>
<td>Bachelor of Nursing (Hons)</td>
<td>An evaluation of the predictive accuracy and usability of a rehabilitation-specific falls-risk assessment tool</td>
<td>2014</td>
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<td>Briggs, Karen</td>
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<td>Brown, Elizabeth</td>
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<td>Evaluation of current practice in Australian ICU’s for the prevention and management of respiratory infections and prevention of Ventilator Associated Pneumonia in critical care patients</td>
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<td>Ewers, Rebecca</td>
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<td>2017</td>
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<td>2016</td>
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<td>Hjorth, Margaret</td>
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<td>Best practices for nursing care of inpatient radiotherapy patients</td>
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<td>Communication of Acute Post-operative Pain (CAPP study): the clinically significant meaning behind numerical pain ratings</td>
<td>2011</td>
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<td>Iddrisu, Suad</td>
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<td>Nurses’ role in recognising and responding to clinical deterioration postoperative complications in patients who have undergone major abdominal or orthopaedic surgery</td>
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<td>Jarhyan, Prashant</td>
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<td>Designing and piloting a community based Chronic Ostrusive Pulmonary Disease (COPD) control and management program in India</td>
<td>2016</td>
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<td>Kilpatrick, Maya</td>
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<td>Lin Cen</td>
<td>PhD Candidate</td>
<td>Patient participation in symptom management in the oncology context: a Chinese cohort study</td>
<td>2012</td>
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<td>Livingston, Amber</td>
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<td>Audit of hyperoxia in ventilated patients</td>
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<td>Ladbroke, Elyse</td>
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<td>McDonnell, Jo</td>
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<td>Completed October 2016</td>
<td>N/A</td>
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<td>Morrison, Sally</td>
<td>Master of Nursing</td>
<td>Systematic review of Role of the nurse/ Nurse manager in antimicrobial stewardship in the private sector</td>
<td>2015</td>
<td>Completed July 2016</td>
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<td>Oldland, Elizabeth</td>
<td>PhD Candidate</td>
<td>Postgraduate education and the development of nurses’ role perceptions in health care quality</td>
<td>2013</td>
<td>To submit December 2017</td>
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<td>Poon, Jeremy</td>
<td>PhD Candidate</td>
<td>Team Communication in the ED</td>
<td>2016</td>
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<td>Schepers, Claire</td>
<td>Master of Nursing</td>
<td>Identifying which ED patients are more at risk of clinical deterioration and Medical Emergency Team (MET) activation</td>
<td>2017 (T1)</td>
<td>2018</td>
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<td>Sungkar, Yasmin</td>
<td>Bachelor of Nursing (Hons)</td>
<td>Early management of sepsis in ED: a systematic review</td>
<td>2015</td>
<td>Under Examination</td>
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<td>Sutthiruk, Nantani</td>
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<td>2014</td>
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<td>Tomlinson, Rose</td>
<td>Master of Nursing</td>
<td>Systematic review of current best practice for management of post-operative pain following cardiac surgery [requiring sternotomy] in the ICU</td>
<td>2015</td>
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<td>Tony, Anu</td>
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<td>Development and implementation of a cardiac cath lab specific pre procedure checklist</td>
<td>2017 T1</td>
<td>2018</td>
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<td>Walsh, Debbie</td>
<td>Master of Nursing</td>
<td>Systematic review of the evidence for APRV ventilation in improving ICU patient outcomes</td>
<td>2017 T1</td>
<td>2018</td>
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<td>Wensley, Cynthia</td>
<td>PhD Candidate</td>
<td>Patient comfort after cardiac surgery: a quality improvement framework</td>
<td>2011</td>
<td>To Submit October 2017</td>
<td>APA Scholarship</td>
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<td>Wilson, Jessica</td>
<td>Bachelor of Nursing (Hons)</td>
<td>A multiple methods study exploring patients’ understanding of and participation in their goals of recovery, focusing on postoperative pain management, following cardiac surgery</td>
<td>2017 (T1)</td>
<td>2018</td>
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<td>Zinkel, Annika</td>
<td>Bachelor of Nursing (Hons)</td>
<td>Cardiologist decision-making about pre-procedural fasting</td>
<td>2014</td>
<td>Completed September 2016</td>
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The Epworth Deakin Centre for Clinical Nursing Research, led by Director, Professor Mari Botti, was established in 2004.

Mari says, “Our work is focused on trying to improve the patient experience, either to address unmet needs or to enhance the quality and safety of the care they receive. Our philosophical framework is that patients be engaged in the processes of care, understand these processes, and be able to participate in their quality and safety outcomes while they are hospitalised.”

“For many patients, this is a highly vulnerable time. Not only because of the illness but because the environment is fast-paced; they are dealing with unfamiliar clinicians and sometimes it’s very hard to advocate for yourself or for others in that environment.”

Three key objectives drive the centre’s activity: to develop investigator-initiated research in nursing that is relevant to Epworth; to build capacity for research within nursing through engaging nurses in honours, masters and PhD programs; and to support quality and safety clinical governance activities at Epworth.

A goal of the centre’s activities is find ways to to engage patients in their own recovery.

A key example of this was the success of the MyStay program trial in 2016. The trial used an app, guiding patients through, and engaging them in, their recovery following total knee replacement. The successful trial led to an Epworth Research Institute strategic grant to develop a second MyStay, for patients after total hip replacement and a further philanthropic grant to develop three further MyStays to be rolled out to other health services.

“Our philosophical framework is that patients be engaged in the processes of care, understand these processes, and be able to participate in their quality and safety outcomes while they are hospitalised.”
The program was created in collaboration with Orthopaedic Surgeon, Professor Richard de Steiger, and PhD student Jo McDonall.

A randomised cluster crossover trial of 240 knee replacement patients tested whether the MyStay intervention affected their pain experience, their length of stay and their satisfaction with care received at Epworth.

“The findings were really outstanding for knee replacement patients. [Patients] experienced reduced pain; one less day of stay in acute care; and were highly satisfied with their care compared to the control group,” Mari says.

“We feel that this is going to be a strength of our centre, to look at developing and testing interventions to improve patient engagement and therefore improve their experience and outcomes.”

The centre also recently completed a longitudinal follow-up study, examining quality of life in patients who have had prostatectomy surgery. The surgery is for men diagnosed with prostate cancer, and takes the form of either a robotic, open, or laparoscopic removal of the prostate. Current evidence is lacking about the best procedure for an individual patient, in order to minimise the often-devastating impact on sexual or urinary function.

“The relevance of this study for men is evident in the retention rates. We had over 1400 men in our final sample and our retention rate at two years was close to 85 per cent. Men were very engaged in the project. They wanted to participate and they want to know what the findings are.”

“We believe the findings will aid discussions between doctors and their patients, helping men to make decisions regarding the best treatment for them.”

The centre is also focused on supporting patients with cancer and their carers — a vital, yet often neglected group.

“Informal carers — family, friends, and support people — are a huge unpaid workforce. We know they suffer poor health outcomes, anxiety, depression [and] distress, and that they do have unmet needs within the community, where care is often focused on the person with cancer and not their carer,” Mari says.

The ACE study, conducted in partnership with Deakin University and funded by an NHMRC partnership grant, investigates whether a simple smartphone application can help patients to meet some of their needs. A PhD student, Natalie Heynesbergh is developing a carer app to meet carer needs. Carer recruitment is underway.

“The apps are a resource for [patients and carers], but they also provide an opportunity to track appointments for particular treatments; if something comes up they can change an appointment through the app. It’s an attempt to provide a service they can access themselves whenever they need it.

“Men were very engaged in the project. They wanted to participate and they want to know what the findings are.”

“We are then measuring whether [patients and carers] record less distress and have less unmet needs at the end of the study. The apps are ready and if the trials prove they are effective and successful, they will be distributed free of charge.

“We work very much in the quality and patient safety space. We collaborate with Epworth’s leadership team to enhance the patient care experience and improve patient outcomes.”
Lay of Summary
The women were all patients of Monash IVF, undertaking stimulated cycle IVF with oocyte collection at Epworth Hawthorn day surgery. They were surveyed to assess the amount of inconvenience and discomfort they experienced. During the pre-operative consultation, permission was obtained for follow up contact. The information was obtained by a telephone survey, seven days post operation. The study was completed during a five week period from August to September 2014, and all 142 women undergoing oocyte collection were requested to partake in the study, with 118 (83%) women completing the survey. The median number of eggs collected was nine. The mean pain score immediately post operation was 4.6, and at 24 hours 3.9, on a scale of 1 to 10. Immediate postoperative pain correlated with the ongoing discomfort and analgesic use. Most women returned to normal activity and work within two days (mean 1.7, SD 1.5 days and mean 1.8 SD 1.5 respectively). The amount of post-operative discomfort was not related to, the number of eggs collected, but it did correlate with the quantity and duration of analgesics consumed, and with the time taken to resume work and normal activity.
Oncology

Strategic vision

To participate and to lead innovation and improvement in the care of patients diagnosed with cancer through participation in clinical research.

Overview

Epworth provides comprehensive cancer services to our community and a vital part of this are treatments given to patients to prevent recurrence as well as treatments for those whose cancer has spread to other parts of their body. Our medical oncologists work within the Cancer Services Clinical Institute and deliver such care to our patients at our Oncology Day Infusion Units at Freemasons and Richmond Hospitals. Medical oncology is a discipline in which there are a large number of studies spanning diagnostic, treatment and survivorship areas.

We currently have 18 oncology trials open with 7 actively recruiting patients and a further 9 in pipeline development for opening in 2018.

Lead Investigators

Prof Stephen Vaughan
Dr Ross Jenkins
Dr Alan Zimet
Dr Rowan Doig
Dr Ayesha Saqib
Dr Ken Khamly
Dr Yen Tran
Dr Ben Tran

Capabilities

The unit is presently engaged in Phase 1b to Phase 3 studies both academic [investigator and collaborative trial group] and industry sponsored. We are developing additional capabilities in biomarker substudies through the Molecular Oncology and Clinical Immunology [MOCI] group and also seeking to develop a survivorship program in collaboration with other research groups.

Clinical trials

A Phase 1, dose-finding and signal-seeking study of the safety and efficacy of intravenous CAVATAK™ (Coxsackievirus A21, CVA21) alone and in combination with Pembrolizumab in patients with late stage solid tumours [NSCLC, Castrate-resistant prostate cancer, melanoma, and bladder cancer]. Sponsor/Viralytics/Chiltern
PI: Dr Ross Jennens

A Randomized, Double Blind, Phase III Study of Carboplatin Paclitaxel/NabPaclitaxel Chemotherapy with or without Pembrolizumab [MK3475] in First Line Metastatic Squamous Non small Cell Lung Cancer Subjects [KEYNOTE407]: Merck
PI: Dr Ross Jennens

PI: Dr Ross Jennens

BR31-A phase 3 prospective, double blind, placebo controlled, randomized study of adjuvant MED14736 in completely resected non small cell lung cancer: CCTG/NHMRC – CTC
PI: Dr Ross Jennens

TRIO: A Randomized, Multicenter, Double-Blind Phase 3 Study Of PD-032991 [Oral Cdk 4/6 Inhibitor] Plus Letrozole Versus Placebo Plus Letrozole For The Treatment
Of Postmenopausal Women With Er (+), Her2 (-) Breast Cancer Who Have Not Received Any Prior Systemic Anti-Cancer Treatment For Advanced Disease: ANZBCTG
PI: Dr Ross Jennens

DUBLIN-3: Randomized Blinded Phase 3 Assessment of Second- or Third-Line Chemotherapy with Docetaxel + Plinabulin Compared to Docetaxel + Placebo in Patients with Advanced Non-Small Cell Lung Cancer and with at Least One Measurable Lung Lesion: Beyond Spring
PI: Dr Ross Jennens

Adding mitomycin C to BCG as adjuvant intravesical therapy for high risk, non-muscle invasive bladder cancer: A randomised phase 3 trial: ANZUP
PI: Dr Shomik Sengupta

PI: Dr Ross Jennens

SOLAR: An Open-label, Randomized Phase 3 Efficacy Study of ASP8273 vs. Erlotinib or Gefitinib in First-Line Treatment of Patients with Stage IIIIB/IV Non-small Cell Lung Cancer Tumours with EGFR Activating Mutations: Sponsor/Astellas
PI: Dr Ross Jennens

BL.12: A multicentre randomized phase ii trial comparing nab-paclitaxel to paclitaxel in patients with advanced urothelial cancer progressing on or after a platinum containing regimen: ANZUP
PI: Dr Ben Tran

A randomized, open-label, active-controlled, Phase II study of intravenous anetumab ravtansine [BAY 94–9343] or vinorelbine in patients with advanced or metastatic malignant pleural mesothelioma overexpressing mesothelin and progressed on first line platinum/pemetrexed-based chemotherapy: Bayer
PI: Dr Ross Jennens

GILEAD: A Phase 3 Randomized, Double-Blind, Placebo-Controlled Study to Evaluate the Efficacy and Safety of GS-5745 Combined with mFOLFOX6 as First Line Treatment in Patients with Advanced Gastric or Gastroesophageal Junction Adenocarcinoma: Gilead Sciences
PI: Dr Ross Jennens

KAITLIN: A Randomized, Multicenter, Open-Label, Phase III Trial Comparing Trastuzumab Plus Pertuzumab Plus A Taxane Following Anthracyclines Versus Trastuzumab Emtansine Plus Pertuzumab Following Anthracyclines As Adjuvant Therapy In Patients With Operable Her2-Positive Primary Breast Cancer: Roche
PIs: Dr Ross Jennens and Dr Ken Khamly

ALLTO: A randomised, multi-centre, open-label, phase III study of adjuvant lapatinib, trastuzumab, their sequence and their combination in patients with HER2/ErBB2 positive primary breast cancer BIG (Breast Int’l Group)
PI: Dr Ross Jennens
Orthopaedics

Strategic vision

Epworth HealthCare will be a leader of innovation, education and research in orthopaedic surgery and will work with our multidisciplinary partners to deliver first class care to our patients.

Background

Orthopaedics is a branch of surgery that looks after people with conditions affecting the musculoskeletal system and at Epworth HealthCare our specialists provide services at our sites at Epworth Eastern, Epworth Richmond, Epworth Freemasons and Epworth Geelong. In addition, Epworth provides rehabilitation services at Hawthorn and Richmond Hospitals. Orthopaedics accounted for 14,586 admissions in 2016, that is, 10% of all activity across Epworth.

The orthopaedic unit is part of the Musculoskeletal Clinical Institute. The unit enrols all joint replacements performed at Epworth into the National Joint Registry. The registry follows up results of joint replacements nation-wide. The Musculoskeletal Institute has multiple, ongoing research programs.

The research centre has focused on outcomes from this data bank to allow the centre to benchmark performance with other orthopaedic units worldwide. Issues such as quality of life before and after surgery, rates of recovery, mobility and function, joint movement and effectiveness of available prosthesis has been compiled. All Epworth orthopaedic surgeons participate in the National Joint Registry, which publishes outcomes specific to prostheses, surgical techniques and particular clinical situations.

Epworth is also a teaching hospital for medical students at Melbourne University, Monash University and Deakin University. Epworth Richmond is a clinical school for the Faculty of Medicine, Melbourne University. Using our state-of-the-art simulation facilities on level 5 of the Cato Wing we provide education for surgical trainees in a partnership with the Royal Australasian College of Surgeons (RACS).

Governance

Epworth HealthCare and the University of Melbourne established the inaugural Victor Smorgon Chair of Surgery with the appointment of prominent orthopaedic surgeon Professor Richard de Steiger. Prof Steiger is the current Director of Research in the Musculoskeletal Clinical Institute. A strategic plan led through the Clinical Institute is currently in development and will lead to the establishment of a clinical research and education working group comprised of research active orthopaedic surgeons.

Current Studies

Professor Richard De Steiger

Population Health

Professor de Steiger continues to collaborate with researchers in this field to link large databases. This involves state, national and international linkages.

- Comparison of lifetime risk of primary total hip and knee replacement surgery between Australia, Denmark, Finland, Norway and Sweden.
- The projected burden of primary total knee and hip replacement for osteoarthritis in Australia to the year 2030.
- Risk of Joint Replacement following sports injury: A Victoria wide study.

Outcomes of Joint Replacement

Professor de Steiger has been appointed President of the International Society of Arthroplasty Registers (ISAR) and in this role will coordinate all the international registries to achieve the global aim of improving outcomes for patients having joint replacement surgery. He was to be a plenary speaker at the American Academy of Orthopaedic Surgeons Annual Scientific Meeting in Orlando, Florida in and the European Federation of Orthopaedics and Traumatology, Geneva in 2016. He continues to perform research and publish many papers on all aspects of joint replacement surgery using data from the Australian
NEW RESEARCH PROJECTS

- **International Signal Detection of Prostheses**
  G. Cafri, L. Paxton, M. Lorimer, A. Cuthbert, R.N. de Steiger, S.E. Graves

- **The projected burden of primary total knee and hip replacement for osteoarthritis in Australia to the year 2030**
  M. Bohensky, I. Ackerman, E. Zomer, M. Tacey, A. Gorelik, C. Brand, R.N. de Steiger

- **The effect of surgical approach in total hip arthroplasty on 30-day readmission and reoperation rates**
  K. Tay, D. McKenzie, R.N. de Steiger

ONGOING RESEARCH PROJECTS

- **In vivo tibiofemoral biomechanics in healthy adults during functional activity**
  Prof Marcus Pandy, Prof Richard de Steiger, Dr Anthony Schache, Dr Hans. Gray, Dr Jonathan Walter

- **Hip arthroscopic surgery in Victoria**
  Prof R Buchbinder, Mr I Harris, Dr I Ackerman, Dr J Kemp, Ms S Coburn, A/Prof J Thorlund, Prof A Bucknill, Dr C Brand, DR M Bohensky, Prof R de Steiger
  *Outcomes of hip arthroscopy in Victoria using VAED data*

- **Synovial Knee Arthritis Research (SKAR): Towards a rational strategy for osteoarthritis therapy**
  Professor Richard de Steiger, Dr Andrew Cook, Professor John Hamilton

- **Genomic and cellular profiling of bone and tumour cells from high risk prostate cancer patient**
  A/Prof C Hovens, Prof A Costello, Prof R de Steiger, Dr M Clarkson, Dr Y Tan, Dr S Lunke, Mr R Stuchbery, Ms N Kurganovs, Mr S Mangiola

- **The investigation of best practices for pain management in joint arthroplasty patients.**
  Australian Research Council (ARC) Linkage Grant with Professor Mari Botti. Ongoing

- **Patient Participation in Post-operative Care Activity**
  This study, led by student researcher Jo McDonall (PhD Candidate) with the principal supervisor Professor Mari Botti, was completed in 2015 and has shown some exciting results. The major aim of the study was to test a multimedia intervention to see if it was possible to improve patient participation in the post-operative recovery following Total Knee Arthroplasty (TKA). It involved the collaboration of a number of surgeons doing TKA at Epworth HealthCare and the preliminary findings have shown a reduction in post-operative pain and also, somewhat surprisingly, a reduction in the length of stay in the intervention group with multimedia. The PhD candidate has currently published one paper and passed her thesis.

A further research grant to investigate patient activation and participation through multi-media has been obtained from the Baker Foundation and the research team is currently working on the MyStay Hip Project with further modules involving spinal, gynaecological and cardiac surgery.

COMPLETED RESEARCH PROJECTS

- **Orientation of the acetabulum in arthritic hips**
  Prof R de Steiger, Mr R Ward
  Melbourne University Honours Student. Software purchased. Measurements of CT Scans will commence in July 2016 and draft systematic review completed

- **International Life Time Risk of THA**
  Dr Ilana Ackerman, Dr Megan Bohensky, Dr Caroline Brand, Professor Richard de Steiger
  Combined analysis of five registries to establish the burden of THA

- **Study: A randomized trial of sevoflurane versus desflurane on the quality of recovery following knee arthroscopy and hip replacement**
  Professor Colin Royse, Professor Richard de Steiger
  Associate Professor Martin Richardson, Zelda Williams
  To identify whether the quality of recovery is affected by propofol sedation or desflurane general anaesthesia when used as an adjunct to spinal anaesthesia in patients undergoing major joint replacement surgery
  Submitted for publication

Associate Professor Martin Richardson

CURRENT STUDIES

**Adhesive Capsulitis Biomarker Study (AD-CAB Study)**
Adhesive capsulitis affects between 2-5% of the normal population and up to 20% of diabetics and is looked upon as the most common disease related to the muscle and skeleton combined (musculoskeletal disease) of diabetes. This is a study based on patients with adhesive capsulitis and will compare them to patients without adhesive capsulitis (i.e. patients having surgery for symptoms associated with shoulder instability) using tissue normally excised and discarded at surgery as well as blood and urine.

This research has been initiated at Epworth HealthCare by Assoc. Prof Martin Richardson, an orthopaedic surgeon at Epworth HealthCare with assistance from his surgical colleagues, including Professor Richard Page and Dr Sean McGee of the University Hospital, Geelong and St John of God Hospital and Specialist Centre, Geelong.

**SOFIE: Surgery for Olecranon Fractures in the Elderly: a randomised controlled trial of operative versus non-operative treatment.**

This trial is run through the Whitlam Orthopaedic Research Centre, Ingham Institute for Applied Medical Research, UNSW Australia. Assoc. Prof Richardson is a member of the trial management committee.

Olecranon fractures are common elbow fractures (particularly in the elderly) that usually occur after a simple fall, and are usually displaced, due to the pull of the triceps muscle that attaches to the olecranon (tip of the elbow). These fractures are usually treated with surgical...
fixation, using wires ("tension band wiring") or a plate and screws ("plating"). There is evidence that non-operative treatment (leaving the fracture displaced) leads to good clinical results. The evidence behind surgical treatment does not include studies comparing these two treatment alternatives, indicating that surgery may not lead to superior results over non-operative treatment. This project aims to test the superiority of operative treatment (wiring or plating) over non-operative treatment for displaced olecranon fractures in the elderly by randomising patients to these two treatments and comparing pain and function in the affected limb up to one year after the injury.

A combined randomised and observational study of surgery for fractures in the distal radius in the elderly (CROSSFIRE), CI Prof Ian Harris (University of Sydney).

This pragmatic, multicentre randomised comparative effectiveness trial aims to determine whether plating leads to better pain and function and is more cost-effective than closed reduction and casting of displaced distal radius fractures in adults aged 60 years and older. The trial will compare the two techniques but will also follow consenting patients who are unwilling to be randomised in a separate, observational cohort. Inclusion of non-randomised patients addresses selection bias, provides practice and outcome insights about standard care, and improves the generalisability of the results from the randomised trial.

Epworth is running this trial at Richmond Hospital. This study has NHMRC and AOA research trust support.

**Associate Professor Minoo Patel**

**CURRENT STUDY**

Efficacy of Pregabalin for peri-operative pain relief in arthroscopic or minimally invasive shoulder surgery – A randomised, double-blind, prospective clinical trial.

This study aims to see how effective Pregabalin is in reducing the pain people have after shoulder surgery. If this study does show that Pregabalin lowers pain after shoulder surgery then this may change doctor’s approach to shoulder operations in the future.

At this point in time, there is no evidence that specifically shows this is the case, and this study aims to fill this gap in medical knowledge. It is already known that Pregabalin helps to reduce pain after a number of similar operations and reduces pain in other medical conditions. This study hopes to help doctor’s make better choices around pain management for patients who are having shoulder operations.
Overview

Research has always been central to the philosophy of OrthoSport Victoria (OSV), a group of 11 orthopaedic surgeons based at Epworth Richmond. The OSV Research Unit was established in 2012 to further develop and improve our research activities. It builds work previously done by Prof Julian Feller in collaboration with Associate Prof Kate Webster at La Trobe University through the former Musculoskeletal Research Centre.

In recent years, we have been able to appoint a Director, Mr Brian Devitt. The Unit now employs three research staff (2.5 EFT), and the OSV Knee Clinical and Research Fellow undertakes the research component of their fellowship through the unit. In addition, we currently have two PhD candidates undertaking their research work with the Unit.

We have developed significant collaborations, both national and international, in addition to our ongoing collaboration with La Trobe University. These include Imperial College London (UK), the University of Minnesota and Ohio State University (USA), Akerhus University (Norway), Cape Town University (South Africa) together with Victoria University (Australia), and the University of the Sunshine Coast (Australia).

The year 2016–2017 was particularly productive in terms of publications, listed elsewhere, building on prior work. At the same time, we made excellent progress with our flagship prospective large cohort study investigating the factors that influence various outcomes following anterior cruciate ligament reconstruction of the knee.

Summary of research activity

COMPLETED STUDIES

The LARS device for anterior cruciate ligament injury – Functional and clinical outcomes at a minimum follow-up of 5-years
Investigators: Mr Cameron Norsworthy, Dr Scott Tulloch, Mr Brian Devitt

Health Literacy in Private and Public Orthopaedic Patients
Investigators: Mr Harvinder Bedi, Mr Filip Cosic

The long-term risk of osteoarthritis of the knee with lateral extra-articular reconstruction: A systematic review of the literature
Investigators: Mr Brian Devitt

The effect of proximally versus distally based lateral extra-articular augmentation procedures of the knee: A biomechanical analysis
Investigators: Mr Brian Devitt, Dr Breck Lord, Prof Andrew Amis, Prof Julian Feller, Mr Andrew Williams

Preliminary results and learning curve of the minimally invasive chevron Akin (MICA) operation for hallux valgus
Investigators: Mr Harvinder Bedi, Mr Charlie Jowett

Strength testing following anterior cruciate ligament reconstruction. A prospective cohort study investigating overlap of tests
Investigators: Professor Julian Feller, Associate Professor Kate Webster, Mr Brian Devitt, Dr Kristoffer Barfod

Development and validation of a short version of the anterior cruciate ligament return to sport after injury (ACL-RSI) scale
Investigators: Associate Professor Kate Webster, Professor Julian Feller

Revision anterior cruciate ligament reconstruction outcomes in younger patients: Medial meniscal pathology and high rates of return to sport are associated with third ACL injuries
Investigators: Associate Professor Kate Webster, Professor Julian Feller

Outcomes of ACL reconstruction differ according to sex, age and sport participation status: Reference data from 2672 Patients
Investigators: Associate Professor Kate Webster, Professor Julian Feller

ONGOING STUDIES

Factors influencing short and long term outcomes of anterior cruciate ligament reconstruction
Investigators: Professor Julian Feller, Associate Professor Kate Webster, Mr Brian Devitt, Dr Richard O’Sullivan, Mr Tim Whitehead, Mr Cameron Norsworthy
Audit of anterior cruciate ligament injuries in the Australian Football League from 1999–2013 to identify factors associated with further ACL injury or a successful return to play

Investigators: Dr Courtney Lai, Associate Professor Kate Webster, Professor Julian Feller

Is there a learning effect exists for isokinetic dynamometric strength testing and can viewing an instructional video can influence performance.

Investigators: Mr Brian Devitt, Professor Julian Feller, Associate Professor Kate Webster, Dr Gerrit Behrens, Mr Taylor Hartwig

A comparison between quadriceps tendon and hamstring tendon anterior cruciate ligament reconstruction in younger patients.

Principal Investigator: Professor Julian Feller

The impact of tibial tubercle-trochlear groove distance and patellar height on the outcome of isolated medial patellofemoral ligament reconstruction

Investigators: Professor Julian Feller, Mr Brian Devitt, Mr Timothy Whitehead, Mr Taylor Hartwig, Mr Haydn Klemm

Arthroscopic hemitrapeziectomy for basal joint arthritis

Investigators: Mr Jason Harvey

Does ACL reconstruction interfere with youth opportunity to become elite?

Investigators: Associate Professor Kate Webster, Mr Alexander Kimp, Professor Julian Feller

STUDIES INITIATED

Biofeedback to Optimise Rehabilitation in an Aged Population with Knee Osteoarthritis

Investigators: Mr Brian Devitt, Mr Haydn Klemm

Long-term outcome from total knee arthroplasty

Investigators: Professor Julian Feller, Dr Jodie McClelland, Associate Professor Kate Webster, Mr Haydn Klemm

Outcome of contralateral total knee replacement

Investigators: Dr Jodie McClelland, Professor Julian Feller

Functional outcomes following proximal hamstring repair

Investigators: Mr Brian Devitt, Professor Julian Feller, Mr Andrew Oppy, Mr Taylor Hartwig

The utility and reliability of the KiRa device in determining pivot shift pre-operatively in ACL reconstruction patients

Investigators: Mr Brian Devitt. Professor Julian Feller, Mr Richard Napier

Does the addition of markings on sportswear aid video analysis of sporting activities?

Investigators: Dr Jodie McClelland, Ms Andrea Bruder, Dr Kane Middleton, Prof Julian Feller

Strategic vision

Develop new and enhance existing collaborations

Our longest collaboration has been with La Trobe University, and we aim is to formalise this through a memorandum of understanding with administrative and staffing benefits for our unit. We are exploring further opportunities to collaborate with the Mayo Clinic in the USA, and The University of Western Ontario in Canada.

Biomechanics laboratory

We hope to establish a biomechanics laboratory for cadaveric studies. This would double as a surgical teaching laboratory and this would be of great value to surgical trainees: registrars and fellows, orthopaedic and non-orthopaedic.

Functional performance assessment centre

We are investigating the establishment of a facility for extensive patient testing including 3-D motion analysis, isokinetic strength testing and functional gait testing, including an electronic walkway, stairs and balance platform. Ideally this space would have good shop front exposure, preferably on Bridge Rd, to facilitate development of a commercially viable concern.

Staff

We currently employ 2.5 EFT research assistants and a 0.4 EFT director. We plan to develop the skills of the current research staff and employ another 1.0 EFT research assistant, potentially utilising the Industry PhD program at La Trobe University.

Translation

We have accumulated an enormous amount of data about return to sport following ACL reconstruction (ACLR) and also about function following knee replacement surgery and knee osteotomy. The Functional Performance Assessment Centre described above would allow for patients to be assessed and advised by strength and conditioning specialists on their deficits and rehabilitation strategies to correct them. Ultimately we aim to be able to develop properly validated return to sport criteria following ACLR, and to identify rehabilitation interventions that facilitate patients in gaining the maximum benefit from surgical procedures, including robotic surgery, for knee and hip osteoarthritis.

Expansion of research areas

The bulk of our research has focussed on the knee, but we have been doing some work in the areas of foot & ankle, and hand & wrist. With increased staff, we plan to develop these areas, as well as shoulder surgery, with the primary focus being clinical outcomes.
We are EPWORTH

For Orthopaedic Surgeon, Professor Julian Feller, research is about finding ways to return people to activities and the sport they love faster, and more safely. Research exploring ways to improve patient outcomes following anterior cruciate ligament (ACL) reconstruction surgery is his passion and while he works with elite athletes, Julian is just as focussed on the weekend warrior.

“Australia is an interesting country in terms of the sports we play. We tend to play high demand sports like football, soccer, netball and basketball, into an older age than a lot of other countries. It’s not unusual here for people to being playing regular, competitive sport well into their 30s. So we have a wider demographic tearing their ACL,” Julian says.

“For research to be useful it needs to be representative of the relevant population, which is why the participants in our research projects are often not elite athletes but rather semi-professional or recreational players.”

The OrthoSport Victoria Research Unit, overseen by Director Mr Brian Devitt, has recently secured further funding through various grants and support from the Epworth Medical Foundation. As a result, the unit has expanded to employ two full-time and one part-time research assistants.

“Most of our work at OrthoSport Victoria has traditionally been based on clinical research, and in particular clinical outcomes. Our research is very focussed on the patient and what they are experiencing,” Julian says.

“In looking at the re-injury rate and the return to sport rate following this procedure, we found it is not as good as everyone thinks.

“We’ve explored that further and found younger patients are more likely to return to sport, as are professional athletes. We’ve also established the re-injury rate for younger patients following ACL reconstruction is very high. So, if you’re a male under the age of 18 at the time of surgery, your risk of either reinjuring the same knee or injuring the other knee is somewhere around 40 per cent, which is a pretty scary figure,” Julian says.

We are supporting a safer return to sport
“Currently there are a lot of arbitrarily chosen, and often time-consuming tests used to assess when someone is ready and safe to return to sport, with virtually no evidence to support their use. I would hope we can show whether these tools are useful or not. If they aren’t effective, we should look for tests which are.”

Part of the unit’s current work involves collaborating with the La Trobe University and the University of Sunshine Coast, to examine balance after ACL reconstruction.

“We have been looking at whether the ability to balance effectively is predictive of whether someone is going to get back to sport or run the risk of re-injury. We’ve been using the Wii platform to measure this, looking to see if high-tech but low-cost technology is broadly applicable.

“We hope that we can refine the tests that we do to define readiness to return to sport. It may actually be as simple as saying – if someone is really young they should wait a longer period before returning to sport than if someone is older. Or we may be able to say someone who has a positive family history of ACL rupture should wait longer, or should do better on a test than the average.

“IT’S ABOUT PROVIDING BETTER GUIDANCE FOR HEALTH PRACTITIONERS WHO ARE ADVISING PATIENTS WHEN IT’S APPROPRIATE TO RETURN TO SPORT AND AS A RESULT TO REDUCE THE RISK OF RE-INJURY,” Julian says.

Another goal of Julian’s project is to understand what markers are available —whether a blood or urine marker or physical examination —to evaluate a patient’s risk of osteoarthritis following knee injury. This would help surgeons when advising patients to return to sport.

“That is always a really difficult conversation to have with someone. There’s really not a lot of evidence at the moment to guide people. Some surgeons advise people not to go back to sport at all but for some people sport is a really big part of their life,” Julian says.

“IT’S ABOUT PROVIDING BETTER GUIDANCE FOR HEALTH PRACTITIONERS WHO ARE ADVISING PATIENTS WHEN IT’S APPROPRIATE TO RETURN TO SPORT AND AS A RESULT TO REDUCE THE RISK OF RE-INJURY,”

“One of the areas of interest for us for a long time has been the psychological aspects of ACL injury and reconstruction. It’s not uncommon for me to suggest a patient see a psychologist if they are struggling with their rehabilitation. This applies particularly to people who’ve had a second injury to the same or the other knee.

“For some,” Julian continues, “participation in sport is their identity and the inability to continue can have pretty dramatic consequences, including depression and even suicide. Understanding the psychological factors involved in ACL injury started off as just a research question but has actually led to better clinical practice.

“We’ve found psychological factors are a huge predictor of whether someone gets back to sport —even before they have their surgery. It’s amazing to me that you can do a questionnaire and from that have a reasonable chance of predicting whether that person will get back to sport following their reconstruction.”

Understanding the psychological factors involved in ACL injury started off as just a research question but has actually led to better clinical practice.

The unit’s most important randomised trial to date involved comparing hamstring and patellar tendon grafts for ACL reconstruction, with 15-year results published in 2016.

Julian is currently an adjunct professor in the Faculty of Health Sciences at La Trobe University and a clinical professor in the School of Medicine at Deakin University. His particular interests are anterior cruciate ligament injuries and patellar instability, as well as knee replacement and osteotomies.
Physiotherapy

Strategic vision

The physiotherapy department will facilitate and conduct research which translates into improved outcomes for Epworth HealthCare patients.

Overview

The physiotherapy department provides services across Epworth HealthCare. However, the governance does vary from site to site (the largest and rehabilitation focused campuses are Epworth Richmond, Epworth Hawthorn, Epworth Camberwell and Epworth Brighton). The scope of practice ranges from pre-admission emergency department, intensive and acute care to centre-based and community based rehabilitation. The physiotherapy department provides care to patients across many streams and clinical institutes at Epworth.

In 2016/17, the department provided therapy to over 7000 people admitted for inpatient rehabilitation (a total of 88,699 rehabilitation bed days), and delivered in excess of 170,000 outpatient sessions. Within physiotherapy, there are a number of specialities, including brain injury, stroke, cardiac rehabilitation, oncology rehabilitation, amputee rehabilitation, lumbar spine surgery, hip and knee joint replacements, orthopaedic trauma, balance and falls management, vestibular rehabilitation and concussion.

At an organisational level, the rehabilitation physiotherapy department sits within the Rehabilitation and Mental Health division. Carolyn Bell is the Executive Director and Professor John Olver is the Medical Director.

Governance

The department has a research unit embedded within it called ‘PRoSpER’ (Physiotherapy ReSearch Epworth Rehabilitation). Membership is comprised of;

• Physiotherapy Manager – Rehabilitation – Claire Ferguson
• Chair – Assoc. Prof Gavin Williams
• Members – Michelle Kahn, Liz Moore, Sara Aldous, Megan Banky and Kathleen Lambrick

The primary aim of PRoSpER is to support Epworth clinicians engaged in clinical research and position Epworth at the forefront of rehabilitation practice in Australia. The overall objective of the PRoSpER group is to strengthen the evidence base of physiotherapy practice through undertaking, mentoring and facilitating clinical research projects, and promoting a research culture within the rehabilitation physiotherapy department at Epworth.

Reporting lines follow established Epworth governance structures (i.e. via allied health to emergency department rehabilitation). However, we have established links and monthly meetings with Alan Taylor, ERI & Divisional finance to ensure transparency and robustness of process regarding tracking of funds and expenses.

Capabilities

Current projects are based at Epworth Richmond, Epworth Camberwell, Epworth Hawthorn and Epworth Brighton, but primarily Epworth Richmond. Almost all projects are Epworth investigator initiated and associated with higher degrees.

The rehabilitation physiotherapy department currently has two completed PhDs, three PhD candidates, one Fellow of the Australian College Physiotherapists, two completed Masters by Research, two Masters by Research candidates and a further two staff in the process of enrolling in PhDs.

In 2016/17, Epworth physiotherapy staff were involved in five keynote and invited presentations, 14 conference presentations, 19 publications and three book chapters.
Current projects

The department is participating in one multi-centre RCT (led by Associate Professor Gavin Williams), and is conducting six other main research projects.

Investigator-initiated studies

<table>
<thead>
<tr>
<th>Project</th>
<th>Chief Investigator + Contributing Epworth Investigators</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>TBStrong: Improving mobility after traumatic brain injury with ballistic strength training.</td>
<td>Assoc. Prof Gavin Williams</td>
<td>Current</td>
</tr>
<tr>
<td>ARMS: Associated Reaction Movement Score</td>
<td>Michelle Kahn</td>
<td>Current</td>
</tr>
<tr>
<td>Critical evaluation of spasticity assessment using the Modified Tardieu scale</td>
<td>Megan Banky</td>
<td>Current</td>
</tr>
<tr>
<td>When is it Safe to Resume Cardiovascular and High-Level Mobility Training After Traumatic Brain Injury?</td>
<td>Sara Aldous</td>
<td>Current</td>
</tr>
<tr>
<td>CRiSSIS: Cardiac Rehabilitation in Stroke Survivors to Improve Survivorship</td>
<td>Natasha Weragoda</td>
<td>Commencing late 2017</td>
</tr>
<tr>
<td>Post discharge care and recovery in a regionalised trauma system</td>
<td>Jemma Keeves</td>
<td>Current</td>
</tr>
</tbody>
</table>

Our key capabilities are in the evaluation of rehabilitation interventions, development of outcome measures, and the implementation and integration of technology into clinical practice. Currently, we participate in industry-sponsored studies on a study-by-study basis, but this usually occurs via EMReM.

Registries

We currently contribute to three key databases that are utilised for research projects. They are the spasticity, amputee and MTO (multi-trauma orthopaedic) databases. On a larger scale, physiotherapy also contributes to the Australian Rehabilitation Outcomes Centre – a national database, which all Australian rehabilitation hospitals contribute to.

Research opportunities

The Epworth Rehabilitation physiotherapy department has developed a strong research program based around our neurological rehabilitation. However, there are significant opportunities to expand and collaborate with teams to target:

- orthopaedic surgery outcomes (particularly spinal)
- joint replacement outcomes
- oncology rehabilitation
- cardiac rehabilitation
- multi-trauma orthopaedic outcomes
- pain management
- stroke rehabilitation
- spasticity management (mixed cohort)
- strength training programs (mixed cohorts).

In each of these areas, Epworth has large existing clinical programs, which are sufficient to run a research program within or alongside, either as a stand-alone Epworth project or as part of a larger trial.
Epworth Radiation Oncology Research Centre (ERORC)

Clinical Trial: TRANSFORM

Radiotherapy Mediated Eradication of Oligometastatic Prostate Cancer (<5 sites) following prior local treatment: A Prospective Phase II trial.

Principal Investigator: Dr Patrick Bowden (Radiation Oncologist)

Basic Information
The TRANSFORM trial is aiming to enrol 200 men who have developed secondary prostate cancer, where the cancer had spread to a small number of areas (less than five). Patients on the trial are given a very high dose of radiotherapy (stereotactic radiotherapy), with the aim of preventing the cancer from spreading any further while simultaneously avoiding the use of hormone therapy and chemotherapy. The treatment is given 5 days a week over a total of two weeks. We estimate that this study will contribute further to the research into controlling the progression of metastatic prostate cancer while minimising the side effects.

Recruitment Status
Accrual Completed (200)

Treatment Status
Multiple treatments are permitted and a number of patients are still returning for additional treatment under the trial protocol.

Follow-Up Status
Protocol follow-up is 5 years post (first) treatment, and project follow-up will run to 2021.

Supported by Varian and Epworth HealthCare, (also Margaret Walcom and Alana Kincade donations)

Clinical Trial: PINPOINT

A clinical trial to investigate using a new imaging test to find where prostate cancer has recurred after surgery, and; using implanted radiofrequency emitting beacons to precisely locate and treat recurrences in the prostate bed.

Technical name: Phase II trial harnessing PSMA-PET and Calypso® real-time tracking to precisely locate and treat recurrent prostate cancer.

Principal Investigator: Dr Patrick Bowden (Radiation Oncologist)

Basic Information
The PINPOINT study is testing a new way of identifying and treating prostate cancer that has recurred in the same place where the prostate was removed from during surgery (prostate bed). There are two parts to the study and not all patients will meet the requirements to participate in both of them.

The first part of the research involves a new way of identifying prostate cancer cells using a Positron Emission Tomography (PET)/Computed Tomography (CT) Scan sensitive to the biological marker, Prostate Specific Membrane Antigen (PSMA).

The second part of the research involves a new way of treating prostate cancer using very small beacons called Calypso® beacons, which are inserted into the prostate bed and emit a radiofrequency (RF) signal. These allow us to locate and track the prostate bed during radiotherapy.

The aim of this trial is to utilise PSMA PET scans to more accurately identify men who have no metastatic disease and only offer those men salvage radiation therapy, using the Varian Calypso® advanced target localisation technique. This will also allow for early identification of men who have metastatic disease, and thus ensure that they receive the appropriate treatment rather than salvage radiotherapy, which would be futile.

This trial is registered on the Australia New Zealand Clinical Trial Registry.

You can read more about it here
www.anzctr.org.au/Trial/Registration/TrialReview.aspx?id=369003
Recruitment Status
Accrual Completed [Phase 1: 162, Phase 2: 81]

Treatment Status
All treatments to be conducted as part of the trial have been completed

Follow-Up Status
All patients are in follow-up. Protocol follow-up is 10yrs post treatment, will runs to 2026.

Clinical Trial: PROSPER-82

A Prospective Phase II Trial Investigating SpaceOAR™ Hydrogel in Patients with Prostate Cancer Receiving Dose Escalated Radiotherapy to 82Gy

Principal Investigator: Dr Andrew See
(Radiation Oncologist)

Basic Information
Men undergoing radiation therapy to treat prostate cancer, are at risk of healthy tissue in the bladder and rectum being affected by the radiation that is delivered to the prostate. The PROSPER-82 trial aims to recruit men with prostate cancer, who have not had surgery to remove their prostate, and who have been referred for standard radiation therapy for this condition. Several weeks prior to radiotherapy, a temporary gel (SpaceOAR®) is injected into the space between the prostate and the rectum. The gel pushes the prostate away from the rectum and bladder. This allows the dose of radiation given to the prostate to be maximised, while minimising any damage to the bladder and rectum.

Recruitment Status
Accrual Completed [71]

Treatment Status
All treatments to be conducted as part of the trial have been completed

Follow-Up Status
All patients are in follow-up to 2020.

Clinical Trial: SHRINC

Stereotactic Hypofractionated Radiation Therapy Including Neurological and Cognitive Assessment

Technical name: A Phase II Prospective Trial of Stereotactic Hypofractionated Radiation for Multiple [≥3] cerebral metas
Lung cancer is the leading cause of cancer-related deaths in Australia. One of the main reasons for this is that lung cancer starts without causing any symptoms and often, by the time symptoms appear, the cancer is incurable. Early detection is a patient’s best chance for a positive treatment outcome. Respiratory Physician, Dr Paul Fogarty, is working to improve the prognosis for lung cancer patients.

“The best way to treat lung cancer is with surgery to remove the tumour. However, surgery requires the cancer be isolated to the lung and not to have spread. Unfortunately, because the lung doesn’t necessarily trigger many symptoms, lung cancer is more likely to be picked up later than many other forms of cancer,” Paul says.

Patients with more advanced disease can receive other forms of treatment including radiotherapy and chemotherapy. In some cases such treatment may be curative, but surgery remains the best option and is only possible in the early stages of the disease.

“Various early screening methods have been explored over the years for people who are at increased risk of lung cancer. These have included things like chest X-rays — a fairly simple tool — or specimens of sputum — a thick fluid found in the lungs and airways — to look at changes in the cells. These tools haven’t been shown to be effective,” Paul says.

“However, computerised axial tomography (CT) scans give us a better, more detailed picture of the lungs. They can detect cancers early, before any symptoms develop. We regularly see this when people are being scanned for some other reason.”

In 2011, the US National Lung Screening Trial (NLST) reported that annual screening of high-risk individuals with low dose CT scans reduced their risk of dying from lung cancer.

The criteria for entering the trial were age, smoking history and length of time since the participant had quit smoking.

“The US study involved people aged 55 to 80, who were either current smokers or had smoked at some stage during the previous 15 years. In particular, heavy smokers, who had at least a 30-pack-year smoking history — that is at least 20 cigarettes per day over 30 years — so a reasonable exposure to cigarette smoke,” Paul says.
Participants must also have quit within the past 15 years, as the longer since the last cigarette smoked, the lower the cancer risk.

The US trial produced strong results in favour of the method, showing the screened group had a 20 per cent reduction in lung cancer mortality, compared to the non-screened group — who had a standard chest X-ray and clinical follow up. This equates to about 3 fewer deaths per 1000 people screened.

However, a CT scan is an expensive diagnostic procedure, and this has proved to be a barrier to the establishment of government-funded screening programs.

“CT scans aren’t cheap and doing annual scans on all the people at risk of lung cancer would be a costly exercise for a government-supported screening program. Establishing such a program would be a big cost to the community, and we need to find ways to maximise the benefit and reduce the cost.” Paul says.

Now, the British Columbia Cancer Agency in Vancouver and Brock University in Canada are coordinating a new international trial, aiming for a total of 8000 participants globally. Epworth Eastern is one of several Australian hospitals participating, coordinated by principal Australian investigator, Professor Kwun Fong at The Prince Charles Hospital in Brisbane.

This latest trial involves increasing the scan interval from one to two years, selecting a higher-risk patient group.

“A risk calculator determines a person’s risk level based on their age; ethnicity; the actual amount smoked and whether they have chronic obstructive pulmonary disease. If their risk is over a certain threshold they then become eligible for the trial,” Paul says.

“We are now looking at whether using this model increases the yield of early cancers we pick up, and whether this can have a greater impact in reducing the number of deaths from lung cancer.

The other aim of the trial is to develop a standardised system for classifying and managing the lung nodules detected by the screening CT scans.

"Some abnormalities picked up on CT scan are highly suggestive of lung cancer based on their size or shape and require further investigation as a matter of urgency. However, CT scans can pick up much more subtle abnormalities and in the earliest stages of cancer you may only see a little spot or a nodule. Most nodules of this nature will turn out to be benign lesions, but this will only become established after following their progress over a period of time to determine whether the lesion is growing or changing.

“This trial is looking at a way of evaluating any nodule detected on screening, to more accurately determine the likelihood of it being an early lung cancer, based on its size, appearance and other factors such as the patient’s age and the presence of emphysema.

“It is hoped that this will help decide which nodules require immediate investigation to establish the diagnosis, and which can be followed radiologically with repeat CT scans. It may also help stratify those nodules requiring follow-up with regard to the frequency of repeated scans.”

Paul says the trial is hoping to establish that early detection screening can be a cost-effective way of reducing lung cancer deaths for those at most risk of developing this hard-to-detect cancer; in the same way current mammogram or cervical cancer screening programs have saved the lives of millions of women.

A screening program has been established in the US, following the positive outcome of the first trial.

“...the trial is hoping to establish that early detection screening can be a cost-effective way of reducing lung cancer deaths for those at most risk of developing this hard-to-detect cancer; in the same way current mammogram or cervical cancer screening programs have saved the lives of millions of women.”

“We are trying to create a similar or better reduction in mortality for lung cancer patients in the future, but also at less cost, so there is the potential for a government-funded screening program to be established.

“The ultimate goal is for a screening program which will enable lung cancer to be picked up early and treated so that lives can be saved,” Paul says.
Urology

Strategic vision

To integrate research into every facet of urological practice to bring optimal evidence based care to all of our patients across all Epworth HealthCare divisions that serve our community. Importantly it will place Epworth strategically to be a leader in international research building on the well-recognised urological research done in Victoria and Australia.

Overview

Urological services are in operation across five Epworth divisions: Epworth Freemasons, Epworth Richmond, Epworth Eastern, Epworth Hawthorn and Epworth Geelong and cares for over 15,000 patients per year in 54 operating theatres and associated outpatient facilities. All urological services are provided except for transplant surgery. Freemasons has the majority of activity with Eastern and Richmond also very significant and the remainder at Hawthorn and Geelong. The major surgery undertaken in urology patients incorporates Robotic surgery at Freemasons, Eastern and Richmond.

Urological research is spread across several units at Epworth and we are in the process of bringing this together under the Uro-renal and Vascular Clinical Institute, currently directed by Associate Professor Laurence Harewood.

There are several urologists with academic interests who operate at Epworth and they provide links to other Victorian, national and international groups. The Epworth Prostate Research Unit, led by Professor Tony Costello is one of the most prominent of our activities and is reported separately in this report.

Governance

The Uro-renal and vascular Clinical Institute will develop an overarching research unit in 2018 and will establish a strategic steering group comprised of:

- Director of Research
- Research Unit Manager
- Nurse Unit Manager
- Research Fellows
- Other (as required)

The strategic steering group will be responsible for managing all aspects of the unit’s activity including finances, research program, strategic development, collaborations and outputs. The Epworth Research Development Unit resources are available to support all these activities and close ties are already established with the EMF and key donors who have provided essential support for activities to date.

Research active urologists

Professor Mark Frydenberg
Assoc. Prof Nathan Lawrentschuk
Prof Tony Costello
Associate Professor Jeremy Grummet
Associate Professor Shomik Sengupta

Research Fellow

Dr Claire Pascoe
Capabilities

Current projects have been driven by our clinicians and are based at a variety of campuses. Consideration for participation is based on scientific merit, site feasibility, ethical and governance standards, and alignment with Epworth HealthCare’s strategic plan. External funding has been critical to establish trials to date.

Clinical trials

Conception, design, conduct and management of clinical trials are a key capability. To date this has been driven through our external collaborations and in particular with groups such as ANZUP (Australian and New Zealand Urogenital and Prostate Cancer Trials Group), professorial university departments and other national and international partners. Research with industry partners has also been underway and collaborations are encouraged to ensure that we bring the best treatments to our patients.

Current Investigator-initiated Studies

Professor Mark Frydenberg

- Understanding how body composition may lead to prostate cancer progression in men. [Monash University]
- Exploring the impact of providing men with information about prostate cancer treatment options prior to receiving biopsy result.

Associate Professor Nathan Lawrentschuk

- PrOMPT Study Imaging with Gallium-labelled Prostate Specific Membrane Antigen Positron Emission Tomography Computed Tomography (Ga68 PSMA PET-CT) for the detection and management of Prostate Cancer - Dr Claire Pascoe (urology research fellow Freemasons)
- Does a fully automated bladder diary increase patient compliance and data accuracy? Prof Damien Bolton1
- PINPOINT TRIAL: Phase II trial harnessing PSMA-PET-CT to precisely locate and treat recurrent prostate cancer-Dr Pat Bowden- See Radiation Oncology report
- TRANSFORM: Dr Pat Bowden- See Radiation Oncology report
- Robot Assisted Radical Prostatectomy satisfaction and attitudes Bradley Reynolds, N Zeps, N1 Lawrentschuk1,2, D Bolton1

Associate Professor Ian Frazer [AIs Dr Marcus Tan and Dr Fiona Chow]

- A Phase 3b, Multi-center, Open-label Trial to Evaluate the Long Term Safety of Titrated Immediate-release Tolvaptan (OPC 41061, 30 mg to 120 mg/day, Split dose) in Subjects with Autosomal Dominant Polycystic Kidney Disease
- A Phase 3b, Multi-center, Randomized-withdrawal, Placebo-controlled, Double-blind, Parallel-group Trial to Compare the Efficacy and Safety of Tolvaptan (45 to 120 mg/day, Split-dose) in Subjects with Chronic Kidney Disease Between Late Stage 2 to Early Stage 4 Due to Autosomal Dominant Polycystic Kidney Disease

Associate Professor Jeremy Grummet

- Clinical and pathologic outcomes of transperineal prostate biopsy: a quality assurance project

Associate Professor Shomik Sengupta,

- Adding mitomycin C to BCG as adjuvant intravesical therapy for high risk, non-muscle invasive bladder cancer: A randomised phase 3 trial: ANZUP

Registries

An ability to interrogate data is integral to all research activity. The Urology Research Unit liaises with Epworth Quality divisions in regard to collection and analysis of Clinical Indicators across the group. External registries such as the Prostate Outcomes Registry- Victorian [PCOR-Vic; Monash University- http://pcr.registry.org.au/Home.aspx] already have data from Epworth Healthcare. This database is about to go National. An example of a publication would be:


These collaborations have come from University of Melbourne-based researchers at the Austin Hospital and also Peter MacCallum Cancer Centre. Epworth HealthCare is Victoria’s leading single provider of robotic prostatectomies surgery (>500 procedures per year) and we will be capitalising on this significant opportunity to examine patient-centred outcomes and value in the provision of these services, via a collaborative organisation-based registry. Findings from this registry will be used to design a series of internal Epworth studies, integrating APM research with orthopaedics, pain services, nursing and allied health divisions. Prof Damien Bolton led the Epworth Robotic Prostatectomy registry from the Eastern Campus and this data was published and won best poster at the Annual EAU meeting.
## Proposed registries and studies*

<table>
<thead>
<tr>
<th>Trial</th>
<th>Chief Investigators/Collaborators</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>IRE- Irreversible Electroporation- Uro-oncology and Hepatobiliary, Pelvic Oncology</td>
<td>A/Prof Nathan Lawrentschuk(^1,2) Prof Damien Bolton(^1) Brett Knowles(^1)</td>
<td>Registry in development</td>
</tr>
<tr>
<td>LIBERATE- focal brachytherapy for Prostate Cancer</td>
<td>A/Prof Jeremy Grummet(^1) A/Prof Nathan Lawrentschuk(^1,2) Dr Andrew See(^1)</td>
<td>In development</td>
</tr>
<tr>
<td>Cystectomy ERAS program</td>
<td>A/Prof Nathan Lawrentschuk(^1,2) Prof Damien Bolton(^1)</td>
<td>Potential (2018)</td>
</tr>
<tr>
<td>Cystectomy outcomes</td>
<td>A/Prof Nathan Lawrentschuk(^1,2) Prof Damien Bolton(^1)</td>
<td>Potential (2017)</td>
</tr>
<tr>
<td>Testicular cancer outcomes</td>
<td>A/Prof Nathan Lawrentschuk(^1,2) Prof Damien Bolton(^1) Ben Tran(^1,2)</td>
<td>Potential (2018)</td>
</tr>
</tbody>
</table>

\(^1\)Epworth HealthCare, \(^2\)University of Melbourne

### Health informatics and social media

Urology has a strong link to health informatics and social media. Multiple platforms provide further opportunities for research. A recent publication lead by Urology but across Colorectal and including the informatics unit at Epworth proves there is room for significant growth in this area:


### Biomedical research

Relationships with leading figures such as Prof Miles Prince are available but are yet be enacted at a urological level. Again, involvement via the Prostate Centre has been important but this has led to publications predominantly outside via the Australian Prostate Cancer Research ([http://www.prostatecancerresearch.org.au/prostate-cancer-centre/](http://www.prostatecancerresearch.org.au/prostate-cancer-centre/)).
Epworth Prostate Centre

Overview

The Epworth Prostate Centre is one of three Australian Prostate Cancer Research Centres (APCRC’s) in Australia, each attached to a major hospital or medical research institute and all are funded by the federal Department of Health.

Initially two APCRC’s (Epworth and Queensland) were established in 2009, with a five year commitment from the federal government. A new funding agreement in 2013 provided a four year commitment to fund three centres, being the Victorian and Queensland centres and a new centre in New South Wales. This year the three centres secured a further eighteen months of funding to transition the centres into another funding source.

Objectives

The funding agreement for all the centre lists three objectives:

1. Identify new ways to detect the presence of prostate cancer and reliably differentiate between slow growing and aggressive forms of the disease;
2. Develop new therapies that target the molecular mechanisms that allow prostate cancers to resist current drug treatments; and
3. Identify accurate markers which assist in predicting treatment response.

In addition, the funding agreement requires each organisation to:

1. Collaborate with the other funded prostate cancer research centres;
2. Collaborate with other prostate cancer researchers, research groups and facilities locally, nationally and internationally; and
3. Progress the understanding and management of prostate cancer.

Key personnel

Professor Anthony Costello AM MD FRACS FRCSI (hon) MB BS – Head of Research

Professor Tony Costello is the Director of the APCRC@Epworth. He is also the Director of Urology at the Royal Melbourne Hospital and Professorial Fellow at the University of Melbourne, Department of Surgery. He was the first to perform robotic surgery in Australia after introducing the technology in Melbourne. He has now trained 50 international fellows in the robot’s use. He established a fully annotated prostate cancer tissue bank that formed the basis of publications in the journals Cell and Nature Communications. In 2000, he initiated the first annual Australian prostate cancer conference, this meeting is now the largest multidisciplinary meeting of its kind in the world. He is the recipient of many accolades and awards, including an Order of Australia for services to medical education and cancer research.

Dr Niall Corcoran MB BCh BAO FRACS PhD – Head of Translational Research

Consultant urologist and senior researcher. PhD in Cancer Biology [2006] – leading to clinical trials investigating the molecular behaviour of prostate cancer tumour cells. Award winner [research/clinical practice]. Urological surgeon at Royal Melbourne, Frankston and Geelong Hospitals. Senior lecturer and research fellow at the University of Melbourne.

Professor Chris Hovens PhD – Research Leader

Lead investigator of a number of collaborative projects with the Royal Melbourne Hospital and the University of Melbourne. His work has been published in a number of leading journals, and he has extensive experience in drug discovery and development, having filed more than 20 different patent applications on discoveries relating to his work.
Recent key achievements:

- 87 peer-reviewed publications (where APCRC@Epworth researchers are first and/or last author on 65 occasions)
- 20% of papers published in journals with an impact factor greater than 8.5
- 134 abstracts/letters/editorials published in peer-reviewed publications
- 11 book chapters
- 136 conference presentations
- 220 samples contributed to The [prostate] Cancer Genome Atlas’ project (TCGA)
- 7 PhD candidates, 3 Honours students, 8 Surgical fellows and 4 Nursing fellows
- 495 consultations through the Translational Research Clinic for complex cases
- 600 cases presented at Multi-Disciplinary Team Meetings
- 13 Clinical Trials managed
- 22,000 patient samples in the Centre’s biorepository, with pathology, radiation/hormone therapy data and related quality of life data have been collected, and provided great scope for investigation

Current projects

Drivers of lethal prostate cancer

Aim
To identify genomic drivers of metastasis and treatment resistance.

Outline
The majority of men who die from PCa do so from metastatic, castration resistant disease. Therefore, identifying the key drivers of tumour cell dissemination and survival in an androgen-depleted environment is essential to improving patient outcomes. Over the last four years, we have developed significant resources that are allowing us to address these issues using approaches that have not been previously possible. Many of these resources and the associated approaches are unique to our Centre.

Early identification of lethal prostate cancer

Aim
To develop clinical tests that can differentiate lethal from indolent Prostate Cancer.

Outline
The majority of prostate cancers currently diagnosed will not pose a threat to life or wellbeing within a patient’s lifetime. However, the inability to accurately determine if a prostate cancers will progress has led to the significant overtreatment of men with early disease, and attendant, unnecessary morbidity. A key focus of the Centre’s activity has been exploring novel methods that enable more accurate risk stratification of patients with clinically localised prostate cancer. The Centre has developed a number of resources that have facilitated research activities.

Professor Mark Frydenberg

- Stromal–epithelial interactions in prostate disease (Monash University)
- Understanding how body composition may lead to prostate cancer progression in men. (Monash University)
- Exploring the impact of providing men with information about prostate cancer treatment options prior to receiving biopsy result.

Assoc. Prof Nathan Lawrentschuk

- Imaging with Gallium-labelled Prostate Specific Membrane Antigen Positron Emission Tomography Computed Tomography [Ga68 PSMA PET-CT] for the detection and management of Prostate Cancer
- Does a fully automated bladder diary increase patient compliance and data accuracy?

Assoc. Prof Ian Frazer (Als Dr Marcus Tan and Dr Fiona Chow)

A Phase 3b, Multi-center, Open-label Trial to Evaluate the Long Term Safety of Titrated Immediate-release Tolvaptan (OPC 41061, 30 mg to 120 mg/day, Split dose) in Subjects with Autosomal Dominant Polycystic Kidney Disease

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Associate Professor Jeremy Grummet

Clinical and pathologic outcomes of transperineal prostate biopsy: a quality assurance project

Associate Professor Shomik Sengupta

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