THE BAIRD INSTITUTE
Applied heart & lung surgical research

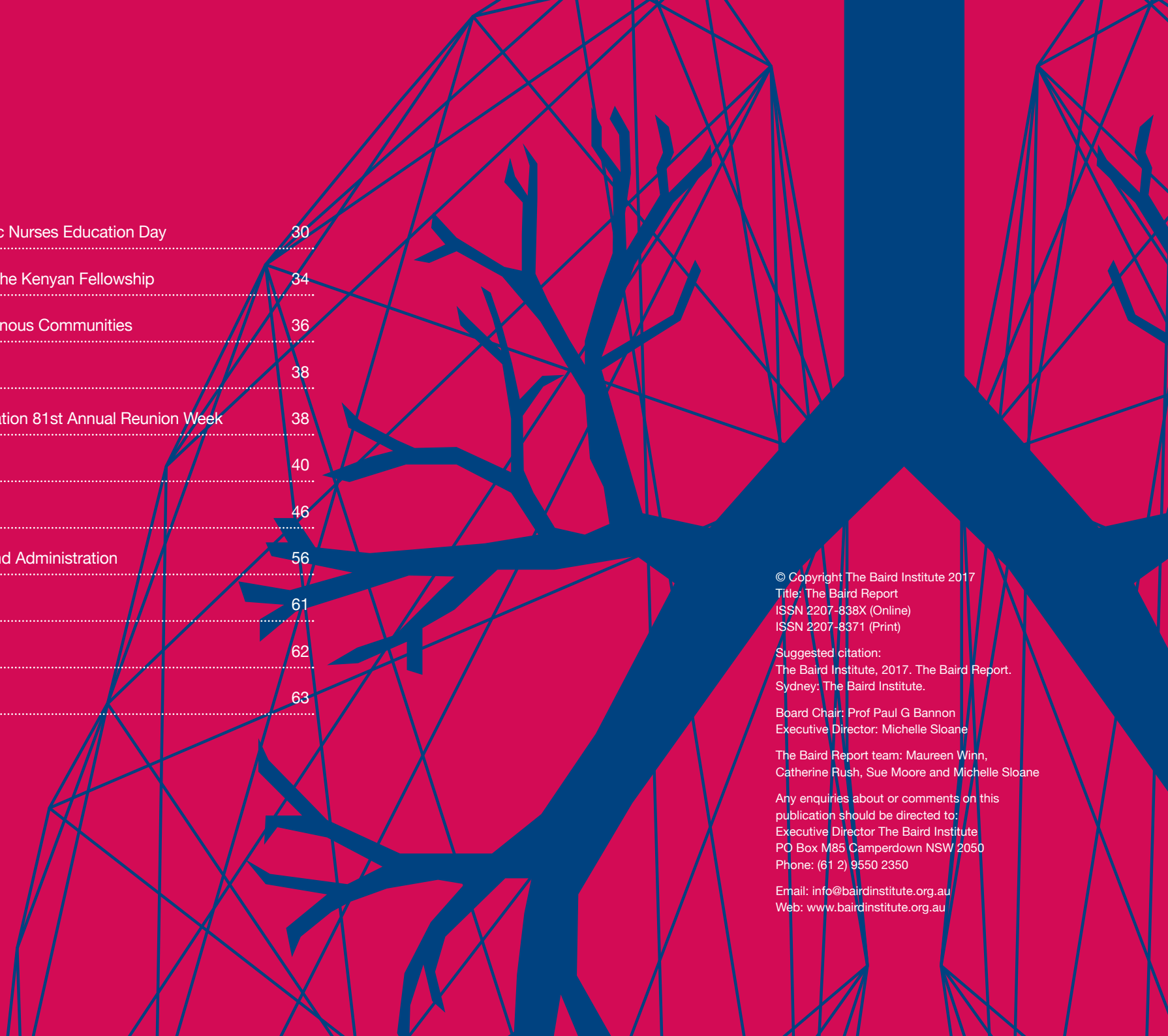
The Baird Report

Heart and Lung Surgery

Advancing Outcomes

Improving Patient Lives

Contents



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Executive Summary

The Baird Institute's mission is
"to foster research and apply science to improve the outcomes of patients facing heart or lung surgery."

While research is mandatory as a part of surgical training, little practical support is offered within general surgical training programs. The Baird Institute recognised this gap and has worked assiduously to encourage cardiothoracic surgical trainees to participate in clinical and applied research. Cardiothoracic and cardiovascular surgeons helped to establish The Baird Institute in order to foster, fund and promote cardiothoracic research in medical undergraduates, graduates, advanced trainees and in its own surgeons.

Through its collaborative model, The Baird Institute ensures that each researcher's work is incorporated in a practical and considered way into their training or post graduate studies. Working in conjunction with Royal Prince Alfred Hospital's Cardiothoracic Surgical Department, our approach is supported by extensive clinical evidence, database management and meta-analysis, as well as the application of basic science.

The current research goals for The Baird Institute include Aortic Valve research, use of Biomaterials, Thoracic Oncology research, Innovative Heart Surgery research and Clinical Evidence trials. In recognition of the role that nursing and allied health play in the perioperative and recovery phase of the patient, new directions in applied cardiothoracic research are being incorporated into The Baird Institute, including clinical innovations, patient support and rehabilitation outcomes from cutting-edge, evidence-based cardiothoracic surgery.

For the last 16 years we have worked collaboratively with many organisations including The Heart Research Institute, the ANZAC Institute, the Asbestos Diseases Research Institute, Surgical Outcomes Research Centre (SOuRCe), The George Institute and The Centenary Institute. The work of these institutions as members of the Sydney Research Council, includes the study of obesity, diabetes, cancer, mental health and the neurosciences, infectious diseases and cardiovascular disease. The Baird Institute's work compliments these approaches and concentrates upon laboratory and clinical research, surgical education and training, and outcomes of care for patient survival and quality of life.

The Baird Institute continues to liaise with The University of Sydney and the Cardiothoracic and Vascular Surgery Department at Royal Prince Alfred Hospital (RPAH), and is now working with the newly created Institute of Academic Surgery at RPAH.

These affiliations make the work of The Baird Institute more global and help to meet the changing needs and focus of healthcare for patients with heart, lung and vascular conditions. To disseminate the work of The Baird Institute, over the last four years, we have held public research events to support the development and training of students and researchers. A stand-out event at conferences has been the use of a wet-lab, where current biological research and surgical techniques can be demonstrated and discussed.

In 2014 our annual conference was held in partnership with the Centenary Institute. The topic was Hypertrophic Cardiomyopathy and the risk factors for sudden death in the young. Speakers included Professor Paul Bannon, Professor Chris Semsarian, Mr. Peter Skillington and Dr. Brian Bailey; Dr. Raj Puranik and Dr. Caroline Medi.

These experts gathered to present and discuss the different manifestations of this condition with the aim of passing on their knowledge and improving the quality of patient care. Their work is collaborative and includes participants from the University of Sydney, Department of Anatomy, Royal Prince Alfred Hospital, and The Centenary Institute and of course The Baird Institute.

Since 2014, The Baird Institute has redesigned its website and this now assists the researcher, student, patient, family, surgeon or donor to understand the work of The Baird Institute and to see how research outcomes actively and positively impact upon the patient and family. We invite you to explore the website www.bairdinstitute.org.au and to enjoy reading this biennial report.

To foster research and apply science to improve the outcomes of patients facing heart or lung surgery

Focused on research...Committed to people

Honouring Professor Douglas (Doug) Baird AM 1940-1995

The Baird Institute is proud to honour his example and continues to support clinically-based heart and lung research

The Baird Institute honours the example of the late Professor Douglas Kevin Baird AM.

Doug, a gifted cardiothoracic surgeon, epitomised the ideals of science, surgery, sensitivity and skill. He was devoted to his patients, many of whom became lifelong friends.

As a medical undergraduate at Sydney University, Doug won seven prizes including the University Medal. He developed his passion for cardiothoracic surgery while an intern at Royal Prince Alfred Hospital, and as a trainee he served with distinction as a member of the Third Australian Surgical Team in Vietnam.

After further studies overseas, Doug went on to become Head of RPAH's Cardiothoracic Surgical Unit.

Doug was committed to ongoing research, believing that surgical outcomes must be continually measured and improved. He was instrumental in developing the Heart Research Institute in Sydney as well as surgical databases at RPAH and for the National Heart Foundation of Australia.

Douglas Baird developed a unique surgical practice founded on principles of mutual respect, co-operation and partnership.

He was a strong advocate for young people: championing a new and compassionate approach to the training and professional development of young surgeons, chairing the Royal Australasian College of Surgeons (RACS) Board of Studies in Cardiothoracic Surgery, and active in the Scouting Association of Australia.

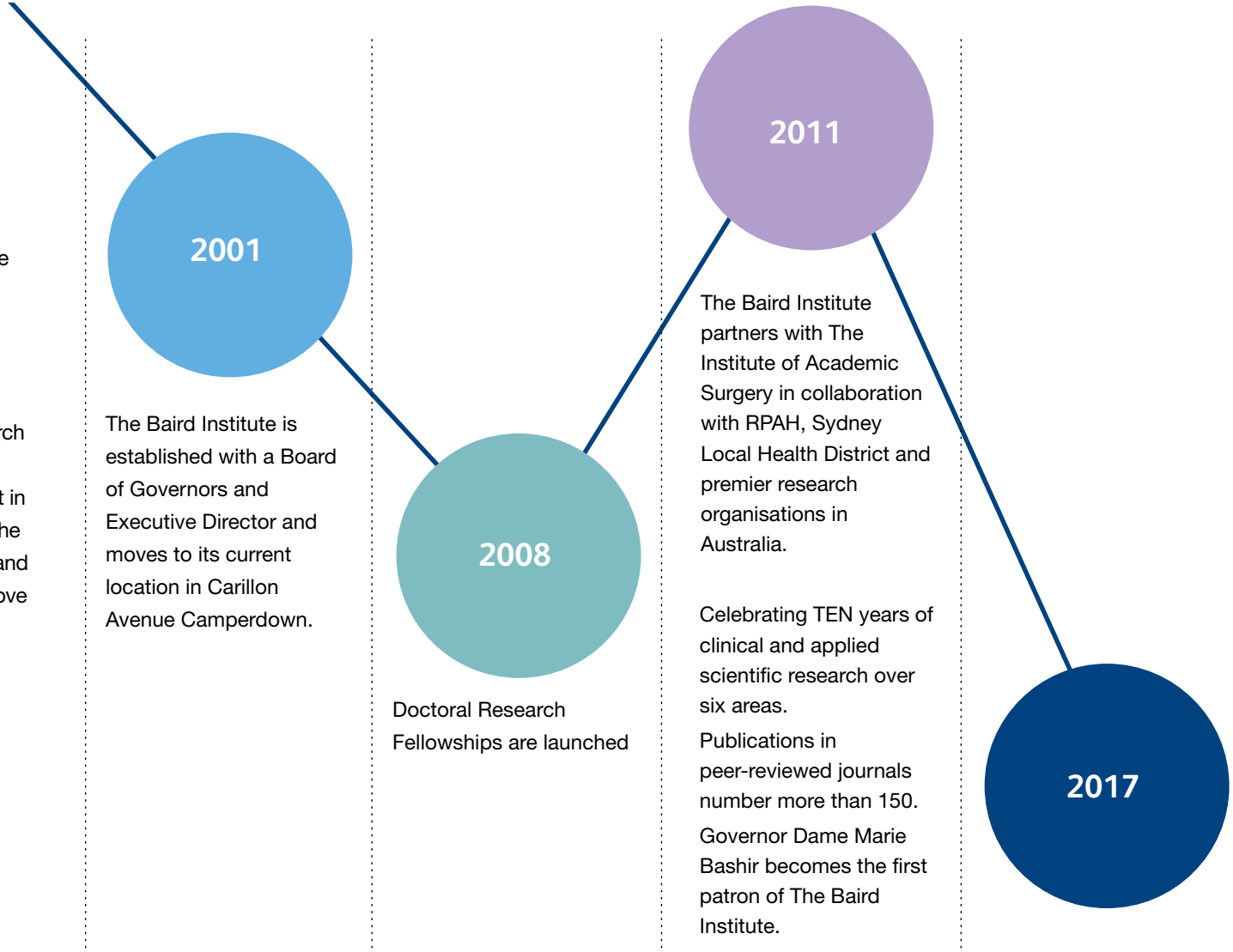
In 1992 Douglas Baird was made a Member of the Order of Australia for services to medicine and young people.

Our Journey – The Baird Institute In 2017

OUR VISION
is to improve the outcomes and enhance the lives of those undergoing heart and lung surgery.

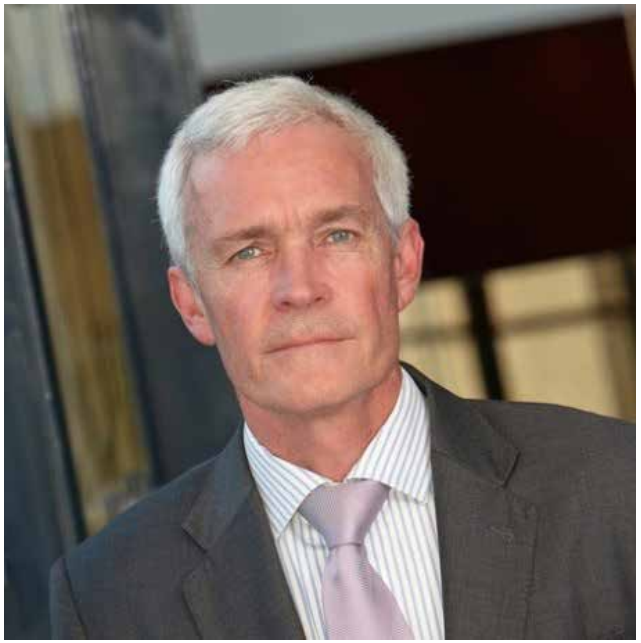
OUR MISSION
is to foster research and apply science to improve the outcomes for patients facing heart or lung surgery.

OUTCOMES
The Baird Institute is conducting and assisting research that directly benefits patients in the areas of new materials for heart valves, best practice management in thoracic surgical oncology, surgical techniques and the use of stents, balloons and patches, drug therapies and the use of patient and family support groups to improve perioperative and post-surgery quality of life.



Report from the Chair of the Board

Professor Paul G Bannon



Research is the fundamental element that informs cardiac surgery excellence and has underpinned the goals of The Baird Institute since its inception.

Cardiac and lung surgery that is robust, uses the latest in technique and technology and has a strong evidence-base, will provide people with person-centred surgical care that meets their needs and that of their family, carers and the community.

The Baird Institute and its researchers, from cardiac surgical trainees through to experienced surgical consultants, are working to improve how, when and why they perform surgery. We include the use of innovative materials, cancer research and outcome studies to ensure that progress continues and is pursued appropriately. Our research publications now number more than 170 clinical and theoretical research reports, abstract submissions to International and National Conferences and contributions to the literature that informs surgeons, physicians, nurses and allied health professionals; along with our key stakeholders – the people needing surgery.

The 2015/2016 year saw The Baird Institute joining with Sydney Local Health District as they formalised their approach to surgical research through the newly formed Institute of Academic Surgery (IAS) at Royal Prince Alfred Hospital. The Baird Institute has a close liaison with the IAS, given its surgeons are key to the success of the Department of Cardiothoracic and Vascular Surgery; two of 17 departments partnering within the IAS. The Baird Institute has a long standing culture of research since its inception under Professor Douglas Baird, AM and through the support of its donors, has had great success in producing clear, relevant and current research that underpins surgical technique research, use of innovative materials and ensures that these contribute to improved patient outcomes.

This in turn fosters academic career development for surgeons and education for surgical trainees, nurses and allied health clinicians.

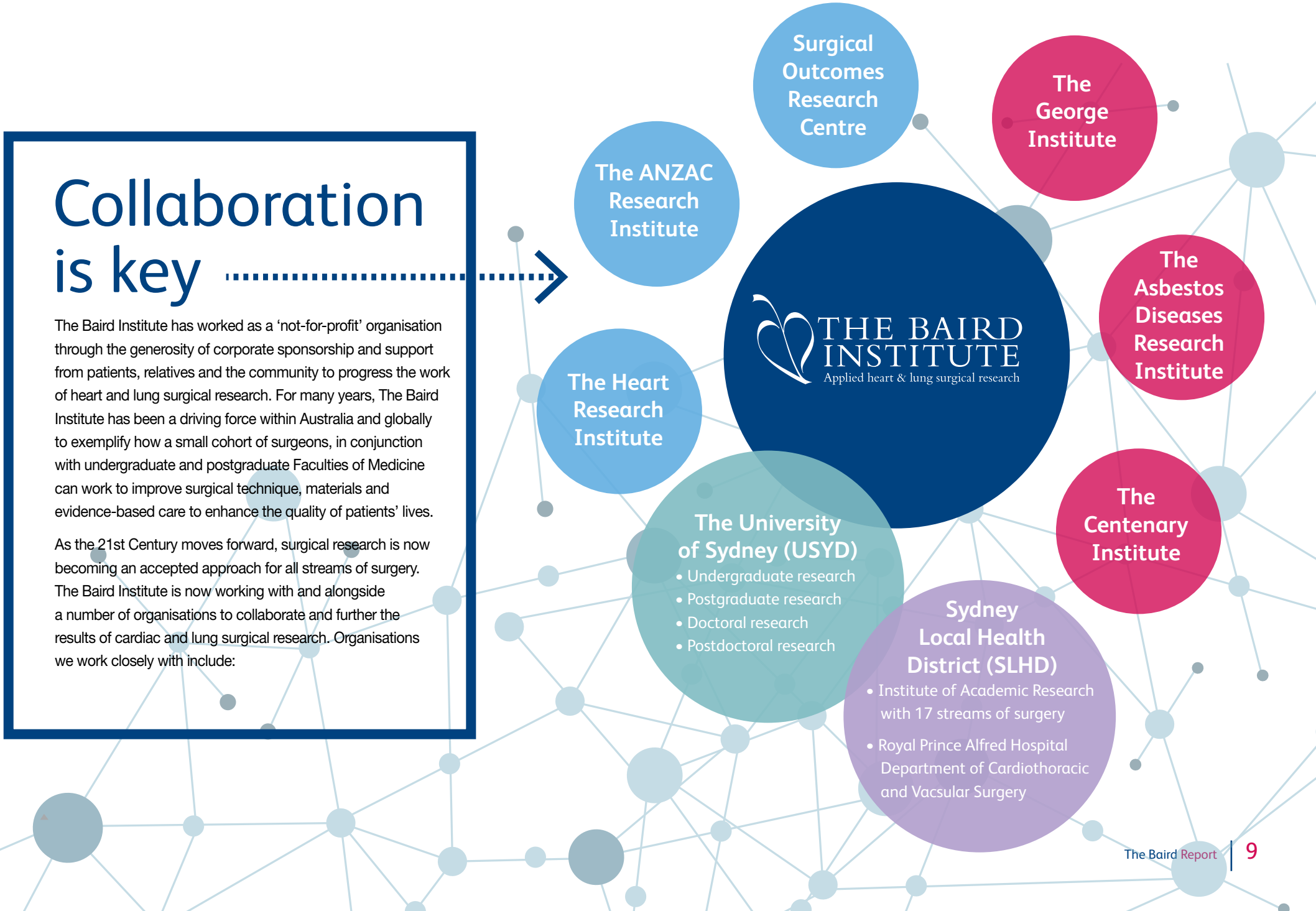
Work continues with one of our key partners, Sydney University, to enhance undergraduate, postgraduate, doctoral and post-doctoral research across the areas of Aortic Disease, Biomaterials to mimic normal physiology, the use of innovative heart surgical techniques along with a greater understanding of thoracic oncology responsive to surgical solutions; all of which are underpinned by clinical evidence research.

I commend this report to you and, as you read through the following pages, it gives great hope that The Baird Institute continues to progress this highly demanding and evolving work, utilising life-long learning to provide the best, evidence-based care to our patients. Our donors are pivotal to this continuing work and the generosity of corporations and that of people personally affected by heart and lung conditions, continues to enhance perioperative and post-surgery quality of life for our patients.

Collaboration is key

The Baird Institute has worked as a 'not-for-profit' organisation through the generosity of corporate sponsorship and support from patients, relatives and the community to progress the work of heart and lung surgical research. For many years, The Baird Institute has been a driving force within Australia and globally to exemplify how a small cohort of surgeons, in conjunction with undergraduate and postgraduate Faculties of Medicine can work to improve surgical technique, materials and evidence-based care to enhance the quality of patients' lives.

As the 21st Century moves forward, surgical research is now becoming an accepted approach for all streams of surgery. The Baird Institute is now working with and alongside a number of organisations to collaborate and further the results of cardiac and lung surgical research. Organisations we work closely with include:



Our Researchers – The Surgeons

The Baird Institute has an integral link with the team at Sydney Heart & Lung Surgeons. As a group of academic surgeons that perform extensive research and teaching, they share the same goal as The Baird Institute of improving patient outcomes.

Professor Paul Bannon is the Chair of The Baird Institute for Applied Heart and Lung Surgical Research. He is Head of Department, Cardiothoracic Surgery at Royal Prince Alfred Hospital, Sydney and holds the Chair of Cardiothoracic Surgery and the Bosch Chair of Surgery, University of Sydney. He has performed over 2500 adult cardiac surgical procedures ranging from coronary artery bypass to complex aortic root and arch reconstructions. He is immediate past President of the Australia and New Zealand Society of Cardiac and Thoracic Surgeons and is the Society representative to the Cardiac Surgery National Database. He is the Co-Chair of the Institute of Academic Surgery at RPAH where he also oversees the robotic surgical program. He heads the National MBS Taskforce Review for Cardiac Surgery and has held various positions in the Royal Australasian College of Surgeons and Royal Prince Alfred Hospital.

Professor Bannon's teaching responsibilities are currently to all years of the Graduate Medical Program at Sydney Medical School, University of Sydney. He supervises local and international Doctorate, Masters and Honours students as well as international elective students. He is the Co Editor-in-Chief of The Annals of Cardiothoracic Surgery and a Director of the CORE Group for International Collaborative Research. Professor Bannon has published widely in books, journals and conference proceedings on cardiothoracic surgery, basic science and evidence based medicine.

He has a particular passion for translational research in the areas of congenital aortic and mitral valve disease, hypertrophic cardiomyopathy, biomaterials and biocompatibility, limitation of blood product usage in cardiac surgery, the inflammatory response to bypass and the development of academic surgical careers. He is a current Chief Investigator on National Health and Medical Research Council (NHMRC) and National Heart Foundation (NHF) grants for biomaterials and congenital heart disease research as well as a current NHMRC Centres of Research Excellence (CRE) grant on mechanical circulatory support. His role in the CRE is to produce NHMRC Clinical Practice Guidelines and measure their dissemination, adoption and outcomes. He personally oversees more than $500,000 worth of research funding annually. His Department currently runs 16 clinical trials amongst many other laboratory and clinically based projects.

Professor Michael Wilson has clinical appointments at Royal Prince Alfred, Concord Repatriation General, Strathfield Private and Macquarie University Hospitals. Professor Wilson has a special interest in the utilisation of emerging technologies and minimally invasive techniques to deal with complex heart and lung surgical problems. He holds an academic appointment at Macquarie University and has extensive experience in clinical and basic science research. He is a board member of The Baird Institute for Applied Heart and Lung Surgical Research.

Professor Wilson has a wide and varied interest in all aspects of cardiothoracic surgery, including total-arterial coronary artery bypass surgery, anaortic off-pump coronary artery surgery, ventricular remodelling surgery (SVR), minimally invasive (including Da Vinci robot) heart (MICS) and lung (VATS/MITS) surgery, complex aortic root, arch and thoracoabdominal aortic surgery, transcatheter aortic valve surgery (TAVI), pulmonary thromboendarterectomy surgery, and surgery for lung cancer. He has presented extensively at national and international conferences and authored or co-authored more than 70 publications in peer-reviewed journals.

Professor Wilson has an international reputation for applying new technologies to complex surgical problems of the heart and lung. He is sought-after for his expertise in managing patients with complex problems. He has been involved in several 'first-in-human' procedures and is a great advocate for teaching the next generation of surgeons to think outside the square and become innovative too.

Professor Michael Vallely is a leading cardiothoracic surgeon with clinical appointments at Royal Prince Alfred, Concord Repatriation General, Strathfield Private, Macquarie University, The Mater and Southern Highlands Private Hospitals. Professor Vallely has a special interest in elderly and high-risk patients with multiple medical issues, and minimally invasive heart and lung surgery. He holds Clinical Professorships at the University of Sydney and Macquarie University. He is a member of the board for The Baird Institute for Applied Heart and Lung Surgical Research and of the Royal Australasian College of Surgeons Cardiothoracic Board. He is the leader of The Baird Institute's Innovative Heart Surgery research group and supervises a clinical and basic research team of Honours, Masters and Doctoral students. Professor Vallely is also a member of the board of the Royal Prince Alfred Institute for Academic Surgery.

Professor Vallely has clinical and academic interests in minimising the invasiveness of cardiothoracic surgery and is a world authority on total arterial, anaortic, off-pump coronary artery bypass surgery. He also has interests in minimally invasive cardiac surgery (MICS and Da Vinci robotic surgery), transcatheter (TAVI and Mitra-Clip) cardiac surgery, thoracic aortic surgery, geriatric cardiac surgery and hybrid procedures including the use of ECMO. Professor Vallely has a special interest in electrophysiological (pacemakers, defibrillators and Cardiac Resynchronisation Therapy) devices and performs more than 250 implants per year. He has presented extensively at national and international conferences and authored or co-authored more than 75 scientific publications in peer-reviewed journals.

Doctor Michael Byrom is a cardiothoracic surgeon with specialised training and experience in minimally invasive aortic valve replacement; aortic surgery, mitral valve repair; all-arterial coronary bypass surgery, surgical left ventricular remodelling, and minimally-invasive thoracic surgery including Video-Assisted Thoracoscopic Surgery (VATS) lobectomy.

Dr Byrom undertook his PhD with The Baird Institute and since completing his training has worked extensively at the Bristol Royal Infirmary, focusing upon techniques in minimally invasive cardiac and thoracic surgery and gaining considerable experience performing aortic root and arch replacement, mitral valve repair, and left ventricular remodelling procedures.

Dr Byrom's doctoral studies at the University of Sydney, completed in 2013, involved a multidisciplinary project between the departments of cardiothoracic surgery, cardiology, biochemistry and physics, to produce two entirely new conduits for use in vascular bypass surgery. This has led to further insights into the design and optimal use of small and large-diameter conduits for coronary artery bypass and aortic surgery as well as other biomaterials in use in cardiothoracic surgery.

At the same time as his PhD studies Dr Byrom also undertook a Graduate Diploma in Surgery focused on biostatistics and epidemiology, and his research interests include the design of laboratory methods and animal models to advance translational research and bring bench side developments into clinical practice.

Current Fellows

Doctor Michael Seco is a current doctoral student and is The Baird Institute's **Edwards Lifesciences** scholarship recipient. Michael is a member of the Innovative Heart Surgery research group and is currently exploring minimally invasive cardiothoracic surgical techniques including off-pump, mini-incision and transcatheter methods of surgery.

The Edwards Lifesciences fellowship enables Michael to pursue his doctorate to further inform the cardiac surgery fields of minimally invasive techniques that provide safe and better clinical outcomes, particularly in elderly and other high-risk patient groups. Some of the more novel approaches for minimally invasive surgery include transcatheter aortic valve replacement and robotic techniques. Early findings have been published in peer-reviewed journals and presented at international scientific meetings.

Doctor Andrew Sherrah is a PhD candidate at the University of Sydney and a trainee in cardiothoracic surgery at Westmead Hospital. He is the current holder of The Baird Institute's Medtronic Heart Fellowship. His research interest is in the diagnosis and management of aortic aneurysm and thoracic aortopathy.

Dr. Sherrah has been involved in several collaborative research projects examining novel management strategies in thoracic aortic aneurysm. Along with Professors Richmond Jeremy, Paul Bannon and Michael Vallely, the risk of adverse outcomes has been better identified in patients presenting to the Royal Prince Alfred Hospital Marfan and Aortic Disease Clinic. Dr. Sherrah is working with Doctors Raj Puranik and Stuart Grieve and their team at Sydney Translational Imaging Laboratory, where emerging MRI techniques (including '4D-flow') have been assessed for their suitability in chronic aortic disease. The role of novel markers of inflammation in predicting aortic aneurysm has been investigated with Dr. Shane Thomas and the Inflammation and Infection research laboratory at the University of New South Wales.

Dr. Sherrah's research has been presented at both national and international scientific conferences and has been published in several peer-reviewed journals. He has been a medical student tutor at the University of Sydney. He is a member of the Aortic Diseases research group and his work focuses upon the diagnosis and management of thoracic aortic disease and its impact upon patient groups. He is working in collaboration with the Sydney Translational Imaging Laboratory (University of Sydney) and the Centre for Vascular Disease (The University of New South Wales). Research within this area looks at risk stratification, biomarkers for disease, imaging techniques and surgical approaches for those patients battling the effects of aortic disease. Current projects include the qualification of myeloperoxidase as a prognostic marker in aortic aneurysm disease and the use of MRI in the assessment of flow dynamics in aortic dissection. Andrew has presented his research at national and international conferences and has been published in peer-reviewed journals.

Doctor Hamid Mollahajian (Hajian) is a Baird Institute scholarship holder, having received the St Jude Medical Scholarship for Applied Heart and Lung Surgical research in 2011. The St Jude Scholarship has enabled him to focus fully upon his research of biocompatibility of vascular grafts. His area of exploration at The Baird Institute is within the Biomaterials group. Research within this area focuses upon the use of novel materials that avoid host-graft rejection or the need for life-long medication. Laboratory development and then human trials will be the way forward within this research area.

Past Fellows

Doctor James Edelman received the inaugural Medtronic Heart fellowship in 2010 and completed his doctorate at The University of Sydney studying the Inflammation, Tissue Injury and Thrombosis in Off-pump Coronary Artery Bypass Grafting. This research aimed to provide further understanding of thrombotic complications after surgery and the processes that link injury, such as blockage and even surgical procedures with the production of inflammation and coagulation. The research has three arms: looking at novel inflammatory markers and cellular responses that are altered after cardiac surgery and contribute to the Systemic Inflammatory Response Syndrome (SIRS); risks after cardiac surgery from both bleeding or clotting and the use of an aortic 'off-pump' surgical technique to avoid neurological injury. Findings from the project have been published in peer-reviewed journals and presented at national and international meetings.

Doctor Michael Byrom is now a surgeon with Sydney Heart and Lung Surgeons and completed his PhD in 2013. He joined The Baird Institute for Applied Heart and Lung Surgical Research as the St Jude Medical Scholarship holder. He initiated research into the development of new artificial blood vessels for use in vascular bypass surgery such as coronary artery bypass. To date this research has resulted in the development of two entirely new types of blood vessel prosthesis as well as numerous conference presentations, publications, and international patents. Michael has worked on reviews of bypass conduit failure as well as guidelines for the laboratory assessment of vascular prosthetic blood compatibility assessment.

Doctor Christopher Cao is a past Research Fellow at The Baird Institute. Concurrent with his clinical practice in Cardiothoracic Surgery, he had a keen interest in academic research, as demonstrated by more than 80 publications and book chapters, including first authorships in The Lancet, The Lancet Oncology, The Lancet Respiratory Medicine, Circulation, Annals of Thoracic Surgery, Journal of Thoracic and Cardiovascular Surgery, Journal of Thoracic Oncology, Chest, and others. He was the chief investigator in a large number of institutional studies, multi-institutional registries, systematic reviews and meta-analyses. Many of these were achieved in a team environment, where he supervised and trained junior residents and medical students to become proficient with statistical analysis and academic writing. As the Section Editor for the Annals of Cardiothoracic Surgery, a Founding Member of the Collaborative Research Group, and a reviewer in more than 20 international journals, he has had extensive experience in surgical academia.

General Fellows

Doctor Roneil Parikh graduated first class from Seth G.S. Medical College and King Edward Memorial Hospital in Mumbai with a Bachelor in Medicine and Bachelor of Surgery in May 2013. Roneil moved to Sydney in August 2013 to pursue a PhD in cardiothoracic surgery under the supervision of Professors Paul Bannon and Graham Hillis. His research is the VISION Cardiac surgical study, a 15,000 patient, multicentre study designed to assess the role of high sensitivity Troponin I as a biomarker to predict complications and survival after cardiac surgery. Supported by his supervisors, Roneil is part of the Australian arm of this study which is running at the Royal Prince Alfred Hospital.

Doctor Vikrant Dhurandhar graduated from Byramjee Jeejeebhoy Medical College, Pune, India, in 2009, with a Bachelor of Medicine and Bachelor of Surgery.

In March 2012, Vikrant moved to Sydney, to undertake a full-time PhD in Surgery, at the University of Sydney, under the supervision of Professor Paul Bannon. He is researching the different aspects of surgical techniques in high-risk cardiac surgery, especially in the elderly and high-risk Australian population - specifically coronary artery bypass grafting and mitral valve surgery.

Doctor Ben Robinson is our inaugural Stanford Exchange Scholar. For a training surgeon, exposure to different approaches can only improve patient care as a diversity of management options can then be applied in complex clinical situations. With this in mind Professor Paul Bannon along with Dr. Joseph Woo of Stanford University established the Stanford/RPAH Clinical Exchange. This exchange enables exposure to various surgical and perioperative management methodologies and will serve to enhance the training and skill of our surgeons.

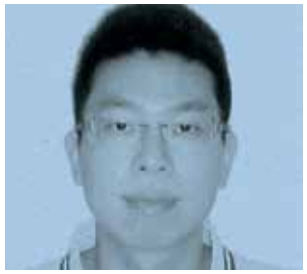
Post Doctoral Researchers

Doctor Sean Lal is a consultant cardiologist associated with The Baird Institute and is currently researching 'The intrinsic regenerative capacity of the human heart'. Sean has a PhD in medicine and has a long association with the University of Sydney and The Royal Prince Alfred Hospital. He is Head of the Cardiac Research Laboratory in the School of Medical Sciences at the University of Sydney among other roles and his research includes the use of human heart tissue, avoiding the need to use animal tissue in associated research as well as researching advanced techniques in cardiac regeneration in the area of heart failure.

Doctor Steve Wise has completed his work with The Baird Institute and is now the Unit Leader in the Applied Materials Group at the Heart Research Institute. He has an NHMRC grant that is looking at the use of bioengineered synthetic material as an elastin conduit for arterial revascularisation. He has a conjoint appointment with the University of Sydney as a senior clinical lecturer at the School of Medicine and continues to collaborate with The Baird Institute.

Medical Researchers

Doctor Michael Stevens has developed advanced skills in the field of biomedical engineering research related to physiological modelling and control. He obtained his doctoral degree from the University of Queensland in 2014, investigating biventricular assist devices through the use of automatic control of dual left ventricular assist devices. It is here that he acquired a passion for robotics; pursuing this further by completing studies in advanced control and robotics. He has extensive experience in both the development of novel software and its uses and has supervised undergraduate and post-graduate students from medical and electrical engineering disciplines. He recently commenced work as a Research Associate at the University of New South Wales, and is connected to The Baird Institute as part of the NHMRC Centre for Research Excellence (CRE) in Advanced Cardio-respiratory Therapies Improving OrgaN Support (ACTIONS). This CRE aims to optimise the risk-benefit profile of ventricular assist devices by improving the patient-device interface and making the technology better, safer and more accessible. Michael is currently collaborating with Professor Paul Bannon, Professor Stuart Grieve (from Sydney Translational Imaging Laboratory) and Associate Professor Paul Forrest to create computer simulations of blood flow during Extracorporeal Membrane Oxygenation (ECMO), with the goal of optimising end-organ perfusion of ECMO patients. Michael has published and presented his work internationally and has been repeatedly successful in writing and gaining research grants.



Bryan Lim is a medical student at The University of Sydney and is undertaking research into methods to reduce the rate of neurological injury associated with coronary artery bypass grafting. The research will use a propensity-matched comparison of anaortic off-pump versus on-pump techniques. He is also conducting a systematic review of the literature pertaining to the timing of surgical intervention in asymptomatic degenerative mitral valve disease.

Doctor Sarah Andvik graduated from the University of New South Wales in 2014 with a Bachelor of Medical Studies (BMed) and Doctor of Medicine (MD). Sarah currently works as a Surgical Resident at St Vincent's Hospital in Melbourne. Sarah's research interests focus on Extra Corporeal Mechanical Oxygenation (ECMO) and aortopathies. She has completed a project on cardiopulmonary resuscitation and the use of ECMO for in-hospital cardiac arrest, conducted at St Vincent's Hospital, Sydney. Sarah presented her results at the Extracorporeal Life Support Organization (ELSO) Annual Congress in Rome, Italy in 2012. Sarah has also presented papers on genetic aortopathies and malignant pleural mesothelioma.

Sarah is currently undertaking research with The Baird Institute, examining veno-arterial extracorporeal membrane oxygenation (VA-ECMO), a highly specialised cardiopulmonary technology that can be used in a prolonged fashion in the intensive care unit, for patients with significant cardiac and/or respiratory failure. This work has the potential to improve the identification of those patients who would most benefit from the use of VA-ECMO.

New Researchers

Dr Andrew Haymet is a Junior Medical Officer at the Royal Prince Alfred Hospital. Dr Haymet's research is currently investigating the long term outcomes of minimally invasive transcatheter aortic valve replacement technology (TAVI).

His previous work with The Baird Institute has included a publication describing rare but potentially lethal complications associated with this technology, titled "Aortic Perforation Following Transcatheter Aortic Valve Deployment".

Given his mechanical engineering background, Andrew is currently planning a PhD in the field of extracorporeal mechanical circulatory support to be supervised by Professor Michael Vallely and Professor John Fraser.

Ben Elias Indja is a medical student at Sydney University with undergraduate qualifications in Project Management. He is completing a Masters of Philosophy on brain injury in cardiac surgery with Sydney Translational Imaging Laboratory, the Heart Research Institute (Prof Stuart Grieve) and The Baird Institute with supervisor, Professor Michael Vallely. His thesis research question is 'Neural network imaging to characterise brain injury in cardiac procedures'.

Dong Fang Eastwood Zhao has a BA and is currently studying medicine at Sydney University. He has a strong interest in cardiothoracic surgery and has been published in the Journal of the American College of Cardiology and has made an oral abstract presentation at the recent European Society of Cardiology Congress 2016 in Rome, Italy.

His research includes the use of no-touch/anaortic off-pump coronary artery bypass grafting, the use of left ventricular assist devices as a bridge to transplantation and mechanical versus bioprosthetic aortic valves in middle-aged patients.

Dr Michael Lee recently graduated from Western Sydney University and is currently working at Royal North Shore Hospital. His interest in heart and lung surgery has led him to be involved in research with The Baird Institute. His research question is in the outcomes of geriatric patients aged 85 years or more who have had cardiac surgery. Michael is also interested in the growing use of advanced technology in surgery.

Dr Michalis Koullouros graduated from The School of Medicine and Dentistry, Aberdeen University and is currently working at The Royal Free Hospital in London. He has a keen interest in surgery and surgical research and has led research projects, published in peer-reviewed journals and presented at surgical conferences.

During his time at the Royal Prince Alfred Hospital, he had the opportunity to work with Baird Institute surgeons within the Department of Cardiothoracic Surgery, and has since collaborated with them in undertaking research in the department.

Michalis aims to train as a surgeon as well as engage in further research in the form of a PhD in the future. His current research question is 'Bilateral versus single internal mammary harvest in coronary artery bypass surgery'.

Stella Rose Harris graduated from Sydney University in 2014 with a Bachelor of Science (Physiology). She returned to Sydney University and is currently enrolled in the Doctor of Medicine and Graduate Certificate in Surgical Sciences. She has commenced her research career by investigating patient outcomes after bypass surgery. Her research question is 'A

propensity matched analysis between anaortic off pump coronary artery bypass grafting and on-pump coronary artery bypass grafting in order to examine 30-day outcome data for neurological injury, mortality and other perioperative outcomes'.

Chad Abbott has a Bachelor of Science and is a postgraduate medical student at Sydney University. Originally from Perth, he is in his final year of studies. Recently, he travelled to both the University of Pennsylvania and Stanford University to complete an elective placement in Cardiothoracic Surgery. He is researching long-term surgical outcomes in aortic valve bioprostheses. His research question is 'Early Structural Valve Deterioration in the Mitroflow Aortic Bioprosthesis'.

Deanna Lee has a Bachelor Degree in Biology (New York University) and is currently studying Medicine at Sydney University. She has a keen interest in surgery. While pursuing her undergraduate degree, she took part in liver cancer research with the Hoshida Lab in the Icahn School of Medicine (Mount Sinai Health System, NY), and worked with researchers at the NYU Langone Medical Centre researching acute brain injuries in the Division of Neurocritical Care.

Deanna is a council member of the Sydney University Surgical Society. Her role is to represent colleagues and to help them in their surgical pursuits by creating opportunities to develop these surgical skills.

Deanna's current research includes 'Prevention Strategies of Ischaemic Spinal Cord Injuries in Descending and Thoracoabdominal Aortic Surgery and Endovascular Aortic Repair: A Systematic Review and Meta-analysis' and 'Ischaemic Spinal Cord Injury in Descending and Thoracoabdominal Aortic Surgery and Endovascular Aortic Repair: A Single Institution Retrospective Case Series'.

In conjunction with these researchers, The Baird Institute welcomes Surgical Consultant, Doctor James Wood (Macquarie University Hospital), who is currently undertaking his Doctorate of Philosophy and the following medical students: Thompson Ly, Elise Kempler, Aaron Adonopulos, Bronwen Needham and Michael Williams.

Nurse Researchers and Associates

Jocelyn McLean joined the Asbestos Diseases Research Institute (ADRI) in the role of mesothelioma support coordinator, after many years of caring for patients having surgery for lung cancer, mesothelioma and benign conditions at Royal Prince Alfred Hospital. The establishment of the support position by ADRI demonstrated their commitment to improving the overall wellbeing of patients with mesothelioma and their carers.

Supporting patients was not new to Jocelyn. She had previously dedicated much energy to the care of patients who had radical extra pleural pneumonectomy (EPP) for mesothelioma; an operation performed by Associate Professor Brian McCaughan. In that role, Jocelyn explored and reported on the experience of recovery of the patients and the needs of their carers. She developed a 'well living support programme' for survivors and carers, and co-authored, with Professor McCaughan a book entitled 'Diagnosis & Treatment: The Journey of a Patient with Malignant Pleural Mesothelioma'. Jocelyn contributed to the development of evidence based 'Guidelines for the Diagnosis and treatment of Malignant Pleural Mesothelioma' published by ADRI in 2013 and was part of the working group that converted the same guidelines into a consumer document that has been published as "Understanding Pleural Mesothelioma" by Cancer Council NSW.

Mr. Bradley Semon enrolled into a drug trial to increase survival rates in mesothelioma disease.

Jocelyn utilises her knowledge and experience of caring for patients and carers, and draws from current survivorship and carer need research, to provide a support service that is both sensitive and personalised. Much of the support is by telephone and face to face meetings. This is supplemented by holding information and support meetings for patients and carers in locations across NSW and holding specially themed meetings, such as those designed to support the recently bereaved.

The continuation of the established well living programme for survivors and carers after EPP, which is generously funded by The Baird Institute, is a major source of inspiration to continue this sometimes difficult and challenging service. Jocelyn also liaises with established services and agencies such as the Lung Nurse Care Coordinators, Dust Diseases Authority (DDA), Asbestos Diseases Foundation of Australia (ADFA), Asbestos Safety and Eradication Agency (ASEA), Lung Foundation Australia, and the legal companies to ensure professionals and local communities across NSW have current information about treatment options, clinical trials, and support services.

Carmel Vanderham is the Clinical Case Manager for Sydney Heart and Lung Surgeons. She is a registered nurse and has worked in Queensland, South Australia and NSW in both private and public hospitals. Carmel commenced nursing in 1989 and immediately chose a post-surgical pathway and then moved to the speciality of cardiac nursing.

For the last 17 years, Carmel has worked in a cardio-thoracic intensive care unit. She holds a Bachelor of Nursing and Graduate Diploma of Critical Care Nursing from Griffith University. Carmel believes that providing an informed and well-prepared perioperative experience facilitates the best possible outcome for the patient.

Judy Chan is a Clinical Case Manager for Sydney Heart and Lung Surgeons. She is a Registered Nurse with more than 20 years' experience in cardiac care and 10 years' experience as a cardiac surgery case manager.

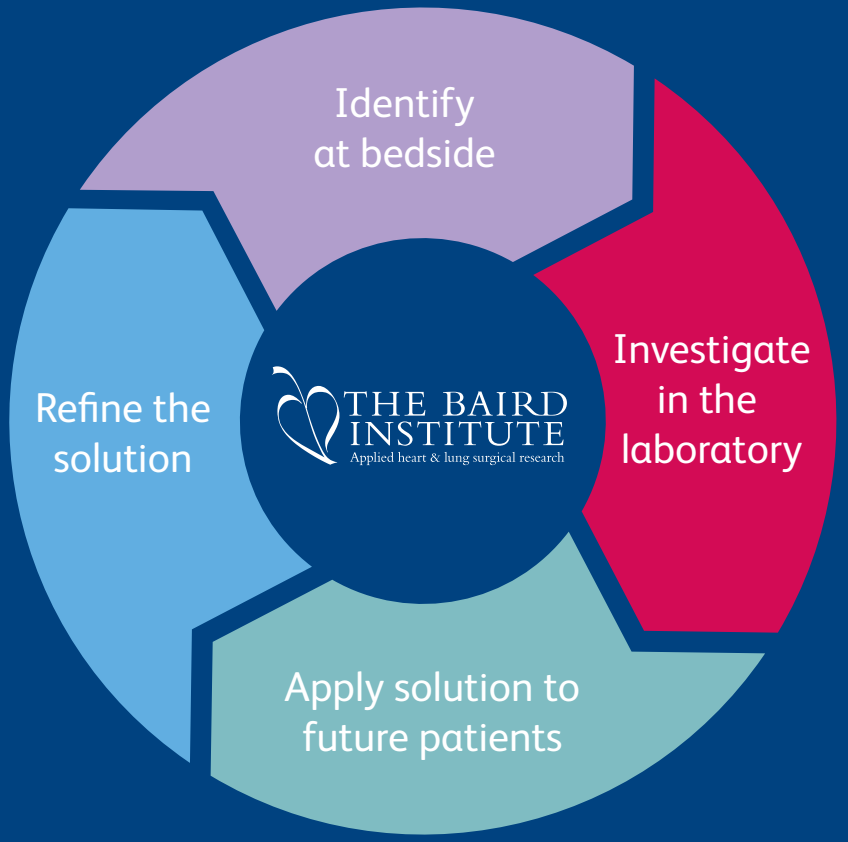
After completing her general nursing and midwifery training, Judy obtained her graduate certificate for cardiothoracic surgical care at Royal Prince Alfred Hospital in Sydney. She then completed her cardiac theatre and intensive care certificates at the National Heart Hospital in London, UK.

Through her years of service it has been Judy's passion to provide excellent holistic patient education and continuity of care.

Our Research – From Bench to Bedside

Our research model is a translational one. As an organisation, we focus on the translation of quality research into improved surgical practice and delivery of long-term public health solutions. This model incorporates expertise in surgical and clinical management with cutting edge research and surgical/health professional training to ensure we have a positive impact at all stages from diagnosis through to treatment and recovery of our patients.

- Aortic Disease
- Biomaterials
- Innovative Heart Surgery
- Thoracic Oncology
- Clinical Evidence Research



Aortic Disease

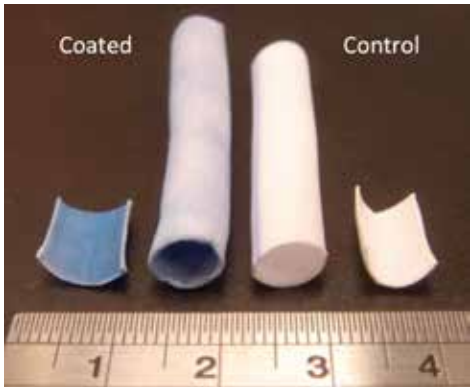
Thoracic aortic aneurysm disease is rapidly becoming one of the most common but silent killers in western society. Many conditions are inherited including Marfan's disease, and those conditions associated with abnormal heart valves. Our research is aimed at determining the precise genetic basis of the condition, the mechanisms leading to the changes in the aorta, and developing peripheral tests to detect enlargement of the aorta and imminent rupture. The Aortic Valve Disease Group has strengthened ties with The Centenary Institute and continues to investigate issues of abnormal heart valves or enlargement of the Aorta. Database information has been developed to monitor genetic and familial representations of these diseases, which in clinical practice is used to help determine how these killer conditions are inherited. The goal is to determine when surgical intervention is optimal or at the lowest risk time for the patient.

Biomaterials

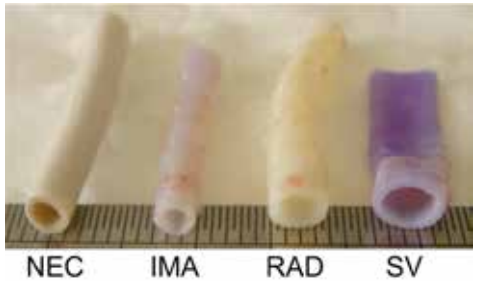
Many different devices are now implanted surgically to repair or improve the function of the heart. These devices, including artificial blood vessels and heart valves, are inserted with minimal risk. However, many are not biocompatible. They may be seen as foreign objects by the body, and may require life-long blood thinning medication, which carries its own burden of disease. Thus, our research is aimed at producing biocompatible devices by electromagnetically coating foreign surfaces with recombinant synthetic human elastin and fibronectin.

This technique is currently being developed to build new blood vessels in the laboratory. As biocompatibility is demonstrated, the technology and knowledge gained may be used to produce other biocompatible devices. Past fellow and current surgeon, Dr. Michael Byrom is commencing further laboratory-based research in conjunction with Associate Professor Martin Ng (Heart Research Institute) and is working with current students, to continue work on new materials and coatings in novel vascular bypass conduits.

Laboratory studies will take place at The Charles Perkins Centre, RPAH, which provides a first-class facility for in-vivo training, testing and assessment of new vascular biomaterial implants including valves, stents, and conduits. Outcomes from this work include the development of a biocompatible 'off-the-shelf' blood vessel for use in patients when the patient's own blood vessels are not suitable or appropriate to the surgery.



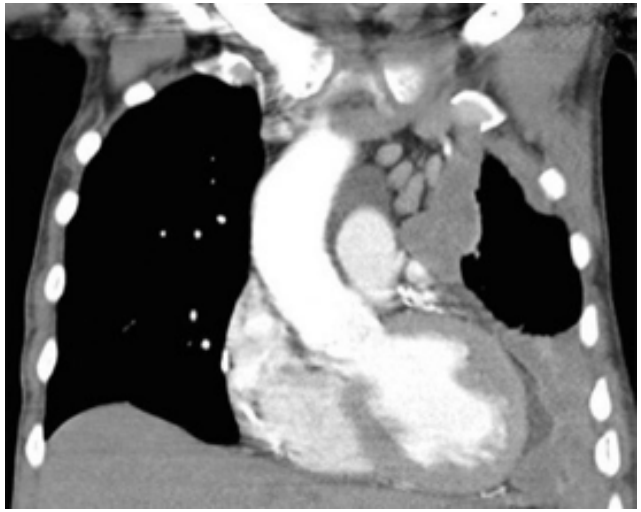
Biomaterials with coating versus control (image courtesy of Dr. Michael Byrom).



Novel elastic conduit against that of the internal mammary artery, the radial artery and the saphenous vein (image courtesy of Dr. Michael Byrom).

Innovative Heart Surgery

Heart surgery in our aging population presents us with unique difficulties, challenges and opportunities. Our research aims to improve the survival and quality of life of the higher risk cardiac patient through the development of novel surgical techniques and strategies, investigating the specific interactions between the heart-lung machine and the body in the laboratory, and determine the optimum approach for each individual patient through meta-analysis. A major impact from this research is to decrease the incidence of stroke during cardiac surgery; as well as to reduce the impact of an artificial heart and blood oxygen machine upon the patient's intra-operative and post-operative recovery. In addition to these anticipated outcomes, further research is being conducted to confirm or alter the advantages between the uses of coronary surgery versus coronary stenting.



Thoracic Oncology

Research understanding has been furthered within the areas of lung cancer, mesothelioma, surgical correction and life extension at The Baird Institute for over 10 years. Our researchers have coordinated a planned approach to the surgical management of patients with these devastating cancers and have built an international reputation for excellence in surgical results and within total patient care. Research into early detection and surgical management are making some inroads into improving patient outcomes.

Clinical Evidence Research

Lorna Beattie (left) joined The Baird Institute team in 2014 and works as the Clinical Trials Clinical Nurse Specialist (CNS). **Lisa Turner** (right) is the Cardiovascular Research Clinical Nurse Consultant (CNC) at Royal Prince Alfred Hospital (RPAH) and has been working in cardiovascular research since 2004.

Lisa and Lorna have over 30 years of cardiothoracic and vascular surgery nursing experience between them. Such experience has equipped them with the essential skills required to manage the many varied Cardiovascular Clinical Trials and databases, as well as communicating with and educating patients and staff.

As well as coordinating logistics for trial commencement, together Lisa and Lorna manage the screening, recruitment, data collection, ethics reporting and patient follow up for the following clinical trials and databases that are being conducted through The Baird Institute and RPAH. They also assist medical students with MD projects through the University of Sydney.

Currently their work includes the following ten clinical trials:

- ATACAS (Aspirin and Tranexamic Acid Clinical trial)
- CORONARY (ON pump versus Off pump Coronary Artery Bypass Grafting (CABG)
- INPACT (Medtronic Drug eluting balloon)
- MAJESTIC (Boston Scientific Drug eluting stent)
- VISION (Vascular events In Surgery patIents cOhort evaluatioN – Cardiac Surgery)
- CLIP - Cryopreserved versus Liquid Platelets for Surgical Bleeding
- Cardiac Surgery Costing Study – HPA and Baxter
- TRICS III – Transfusion requirements in cardiac surgery
- SHIELD – A multi-centre, parallel, blinded randomised comparison of the safety and efficacy of balloon angioplasty plus intraluminal SBCV to balloon angioplasty alone for the treatment of stenosis or occlusion within the common femoral artery; where SBCV refers to a product that acts as a localised physical barrier at the vascular wall
- CO POC – Colchicine for the prevention of Peri Operative complications

In addition to these clinical trials, Lisa and Lorna maintain data for six Clinical Registries:

- Myectomy Surgery database
- Thoracic Aortic Surgery Tissue bank and database
- IRAD - International Registry Aortic Dissection
- The Arch Project – International Aortic Arch Surgery registry
- GREAT – W.L. Gore endovascular device for treatment of aortic aneurysms
- ENGAGE – Medtronic endovascular device for the treatment of aortic aneurysms

Together they maintain the Australia and New Zealand Society of Cardiac and Thoracic Surgeons (ANZSCTS) Cardiac Surgery database and provide education on the drug Warfarin for postoperative cardiovascular patients.

Professor Doug Baird initiated an empirical approach to cardiothoracic surgical advancement by establishing the cardiothoracic database at Royal Prince Alfred Hospital.

VISION Cardiac Surgery

RPAH is very excited to be participating in this worldwide study recruiting 15,000 patients from 12 countries worldwide. Lisa and Lorna have currently recruited 362 patients at RPAH with 9,600 enrolled internationally. Recruitment will continue into 2018.

The VISION Cardiac Surgery Study aims to determine the relationship between postoperative high-sensitivity Troponin I (a protein released from heart muscle after injury) measurements and the 30-day risk of mortality, the proportion of perioperative myocardial injuries that may go undetected without perioperative troponin monitoring, and the incidence of major vascular complications after surgery.

The VISION Cardiac Surgery Study will establish the role of perioperative High-sensitive Troponin I (HsTnI) measurements in identifying prognostically important myocardial injury after cardiac surgery and the proportion that would go undetected without routine troponin monitoring. This, in turn, will facilitate further studies of timely interventions. This cohort study will also determine the current incidence of major perioperative vascular events in a representative sample of contemporary adult patients undergoing cardiac surgery.

Collaborative Grants

Peer Reviewed Grants

NHMRC Grants

- Transfusion Triggers in Cardiac Surgery Australia trial (TRICS-III)
- Bioengineering Synthetic Elastin Conduits for Arterial Revascularisation
- Developing more effective synthetic conduits to treat vascular disease
- Centre for Research Excellence in Advanced Cardio-respiratory Therapies Improving OrgaN Support (ACTIONS)
- The VISION Cardiac Surgery study and nested Colchicine to prevent Post-Operative Complications trial
- ARCH - Improving neuroprotection strategies for surgery of the thoracic aortic arch

Non-Peer Reviewed Grants

St. Jude Research Fellowship

Dr. Hamid Mollahajian (Hajian) received the St Jude Research Fellowship and is working with Professor Paul Bannon in the biocompatibility or synthetic graft research group. Hamid has been researching the use of novel biomaterials to aid in the use of vessel grafting in cardiovascular surgery. Hamid's research began in 2011, exploring new biomolecules that could be engineered to coat inside the grafts. This research has involved meticulous animal-based research for proteins best suited to become part of the material for vessels used in bypass surgery.

Professor Paul Bannon speaking at the Cardiac Nurses' Education Day 2015, with St Jude Medical as one of the key sponsors.

The chosen biomolecule was found to improve the characteristics of conventional grafts to a remarkable extent, leading to more favourable interactions with blood vessel cells.

The challenges in sourcing the graft material led to the creation of a new graft made from polycaprolactone that endures high pressures and shows resistance to leakage. Healing properties were evident in the new product and clotting around the area was reduced – giving favourable signs for its potential in larger animals and potentially in humans.

Hamid has published results of this 'research in progress', including a paper with colleague Dr. Steve Wise: Immobilisation of a fibrillin-1 fragment enhances the biocompatibility of PTFE. Published in 2014 in the journal 'Colloids and Surfaces B: Biointerfaces', Hamid's work continues to identify coatings and their properties for vessel grafting that will reduce clotting of the vessel and reduce the surgical patient's inflammatory response.

Medtronic Research Fellowship

Dr. Andrew Sherrah BSc MBBS (Hons) received the Medtronic Heart Fellowship to complete doctoral studies in the diagnosis and management of thoracic aortic disease.

Doctor Sherrah's current projects include the qualification of myeloperoxidase as a prognostic marker in aortic aneurysm disease and the use of magnetic resonance imaging in the assessment of flow dynamics in aortic dissection. He has presented his research at both national and international scientific conferences. Doctor Sherrah is also a medical student tutor in the Sydney Medical Program, University of Sydney.

Dr. James Edelman was awarded the inaugural Medtronic Heart Fellowship in 2010. He is a trainee in Cardiothoracic Surgery and the Medtronic Fellowship has enabled him to take time away from clinical training to undertake his PhD full-time at the University of Sydney, under the supervision of Associate Professor Michael Vallely and Professor Paul Bannon.

Dr. Edelman's PhD project is titled "Inflammation, Tissue Injury and Thrombosis in Off-pump Coronary Artery Bypass Grafting". The aim is to better understand thrombotic complications after surgery, and the processes linking injury with inflammation and coagulation. Divided into three parts, the project focuses on (1) novel inflammatory markers and cellular responses that are altered after cardiac surgery and may contribute to the systemic inflammatory response syndrome; (2) the alterations in coagulation that follow surgery and may put patients at risk of either post-operative bleeding or thrombosis; and (3) the prevention of neurological injury in coronary artery bypass grafting by using the 'an aortic' off-pump technique.

Some early findings from the project have been published in peer-reviewed journals and presented at the Annual Scientific Meetings of the Australasian Society of Cardiothoracic Surgery and Cardiac Society of Australia and New Zealand. James is a Clinical Associate Lecturer at the University of Sydney and regularly teaches students in the Graduate Medical Program at the Sydney Medical School.

Edwards Lifesciences Research Fellowship

Dr. Michael Seco commenced his internship at Royal Prince Alfred Hospital in 2015. The award of Edwards Lifesciences fellow has enabled him to complete his PhD part-time during medical school and internship. Dr. Seco's PhD project is titled "Minimising the invasiveness of cardiac surgery" and is performed under the supervision of Profs. Michael Vallely, Paul Bannon, and John Fraser (UQ). The aim is to evaluate the safety and clinical outcomes of new, minimally-invasive techniques, especially in elderly or high-risk patients. This includes transcatheter aortic valve replacement, off-pump coronary artery bypass grafting and robotic techniques.

Some early findings from the project have been published in international peer-reviewed journals and presented at the Annual Scientific Meetings of the Australian & New Zealand Society of Cardiac & Thoracic Surgery.

Patient Impacts

Mark Edmonds was 49 years young when he experienced excruciating chest pain and was admitted to Royal Prince Alfred Hospital Emergency Department with a diagnosis of an acute myocardial infarct. In lay terms, this was a heart attack caused by the sudden and complete blockage of an artery that supplies blood to the heart muscle. Without immediate treatment, heart attack can cause permanent damage to the heart muscle or even death.

Research, such as that fostered by The Baird Institute, has identified that the cause of heart attack is coronary artery disease, where a slow build-up of fatty deposits on the inner wall of the artery causes decreased flow of oxygen-enriched blood to the heart. These fatty deposits attract blood cells, causing a plaque to gradually clog and narrow the inside channel of the arteries. From the paramedic ambulance service to within the Emergency Department, the multidisciplinary team mobilised to efficiently diagnose Mark's condition and begin immediate resuscitation. An angiogram revealed major blockages within multiple arteries, ruling out the use of stents to re-open these arteries.

A surgical review identified that coronary artery bypass grafting (CABG) using a healthy artery or vein from Mark would be able to re-establish blood flow to his heart muscle. An 'on-pump' procedure was performed to ensure that oxygen rich blood reached Mark's brain and other vital organs while surgery established new blood flow to the heart muscle.

The Baird Institute's work focuses upon the provision of multidisciplinary care based on clinical and research evidence to identify the best approach to surgery that is curative and considers the patient's post-operative quality of life, reduction in chest pain symptoms (angina) and other cardiac issues that may impact upon the individual – aiming to help the person resume an active lifestyle with the best chance for survival. Mark is a terrific example of how this approach to quality research and evidence-based care can lead to the best of all possible outcomes.

Margret (Maggie) Cooper first became aware of her cardiac condition during a school health check when she received more attention and a jelly bean from the doctor who listened to her heart!

It was thought that the altered heart sounds signified a defect that would eventually resolve. However, Margret found that she couldn't participate in active games or sports as she became breathless and would often have to sit with her head between her knees to ward off dizziness.

When pregnant with her second child, she was sent to see Dr. Bailey, a leading cardiologist at Royal Prince Alfred Hospital (RPAH), where she was formally diagnosed with an Atrial Septal Defect or 'ASD'. This congenital defect results in a hole between the two atrial chambers of the heart. Margret was not fully aware of the complications from an ASD and at the time being so busy with young children (and with no desire to face heart surgery), follow-up did not eventuate.

Gradually symptoms began to manifest and came to a head when a travel insurance company requested a report on Margret's cardiac status. Further investigations and angiogram revealed that the ASD was extensive and had enlarged one side of the heart. Margret was referred to Professor Bannon, who explained that symptoms would worsen rapidly and without surgery, death was a very real possibility. At age 48, Margret underwent repair of the ASD without any major setbacks. Since the operation, Margret values every day as a precious opportunity. She acknowledges the care of the doctors and nurses who supported her in hospital and the steadfast care of her husband Paul that has helped her recover.

Margret has since regained her strength by walking daily and watching her diet. She has taken up cycling and has had some wonderful adventures starting with a short but delightful first overseas holiday in Hong Kong with her daughter and she has since walked the Camino de Santiago across Spain – some 700km; climbed Mt Fuji with her son and conquered Australia's Mt Kosciuszko.

***Philip Gengos** felt a sudden tear in his back. "I do not recall much, but the cardiologist later told me that he wanted me to have a stress test but I kept telling him of the pain in my back and he ordered an ultrasound.*

The scan revealed that I had a torn aorta and blood was leaking into the artery walls, ready to burst.

Surgery was ordered immediately. I was very lucky as most people with this condition don't make it to the operating table."

Earlier this year, while playing his regular Tuesday night tennis, Philip Gengos felt a sudden tear in his back followed by the immediate onset of dizziness and nausea. He felt unwell and was persuaded by his friends to go straight away to the emergency department. Philip went to Royal Prince Alfred Hospital, where staff decided to keep him overnight for further review.

Philip's condition was thought to be due to a congenital aortic blood vessel defect, estimated to affect 1 in 1000 people. Familial thoracic aortic aneurysm and dissection (TAAD) is a disorder that involves problems with the aorta, which is the large blood vessel that distributes blood from the heart to the rest of the body. Familial TAAD affects the upper part of the aorta, near the heart. This part of the aorta is called the thoracic aorta because it is located in the chest (thorax).

In familial TAAD, the aorta can become weakened and stretched (aortic dilatation), causing a bulge in the blood vessel wall (aneurysm). Stretching of the aorta may also lead to a sudden tearing of the layers in the aorta wall (aortic dissection), allowing blood to flow abnormally between the layers.

"What was to be a 5 hour operation stretched to 12 and I was lucky to survive."

Professor Michael Wilson performed the surgery and later said that Philip's aorta had torn quite a lot and that it was one of the most difficult operations of its type he had performed.

At 53, Philip had no previous illnesses or medical problems and as a result never thought to have a check-up. He had not experienced any warning signs other than feeling and looking tired. All of this he had put down to his age and just working hard.

When asked initially whether there was any history of heart problems in his family, Philip could not remember. At the time he was asked, he had forgotten that his grandfather died suddenly in his early 50's. Philip did not know what his grandfather had died from but presumed that it may have been due to problems with his mitral valve – something that Philip's father had suffered with late in his life.

Whether Philip's torn aorta was due to a congenital condition or not, he will now need to commence the regular surveillance management program which is in place at Royal Prince Alfred Hospital. It will be important for all members of Philip's family bloodline, who might potentially be at risk, to be checked. TAAD is rapidly becoming one of the most common but silent killers in western society. The all too common story is that diagnosis is incidental to the symptoms arising from a dilated or ruptured aorta.

The Baird Institute's research is aimed at determining the precise genetic basis of Thoracic Aortic Aneurysm Disease, the mechanisms leading to the changes in the aorta and the development of peripheral tests to detect enlargement of the aorta and imminent rupture. Our goal is to determine when surgical intervention is optimal or at the lowest risk time for the patient. The Baird Institute's Aortic Disease Group is led by Professor Paul Bannon and Professor Michael Vallely and includes one of our current PhD students, Dr. Andrew Sherrah.

***David Curnow** was a fit, 35 year old father of two daughters aged 20 months and almost three months when he underwent heart bypass surgery.*

"At first I thought I was just having an off day and would try to push through. However, the frequency of the chest pains increased, even while relaxing at home watching Masterchef."

Prior to his surgery he led an active, healthy lifestyle; running almost daily and competing in half marathons. About a month before his surgery he had been experiencing chest pains during runs.

Two of David's work colleagues, one in his 30s the other in his 50s, had died from heart attacks in 2011, so he was very worried. Not being a "typical" heart attack candidate, GPs had not ordered tests to help diagnose the problem.

In Australia today it is estimated that one third of all Australians will die from some form of coronary artery disease.

A chance conversation with a good friend, Professor Michael Vallely, led to an appointment with a cardiologist, Professor Ian Wilcox, and a few days later heart bypass surgery was performed by Professor Paul Bannon. "I was diagnosed as having a 99% blockage in my left anterior descending artery – also known as the 'widow maker'".

"I was told it was only a matter of a week or two before I would have suffered a massive and likely fatal heart attack. I am so grateful that Professor Bannon was available to perform my surgery so soon. The alternative does not bear thinking about."

In Australia diseases of the heart, lungs and blood vessels kill more people than any other disease. These diseases can affect people of any age at any time – even babies and young children. Severe coronary heart disease at present is predominantly treated by surgery.

The Baird Institute is unique among medical research organisations. We are the only group in Australia to focus entirely on clinical and surgical cardiothoracic conditions. Our focus is ALL diseases of the heart, lung, chest wall and diaphragm that are treatable with surgery. Our commitment is to the patients who have been diagnosed with these serious conditions and require surgery.

While research into heart and lung disease is being done; little time, effort and money is directed to improvements in surgical techniques for the most frequently diagnosed forms of heart and lung disease. The Baird Institute strives for better patient outcomes by improving clinical practice, testing new methods of surgery and ensuring that post-operative care is the best it can be. Our focus is on supporting patients and reducing the overall burden of health care on the community.

"Three months on from my surgery I have resumed my normal activities and have eased back into running. I have spoken to other heart bypass patients and I am so pleased that I received a mammary artery graft which will, as far as anyone knows, last me the rest of my life.

No one is safe from cardiovascular disease. This experience has changed my life. The greatest lesson is to listen to your body if things do not seem quite right.

I cannot adequately express how thankful I am for the vital work conducted by The Baird Institute to develop new techniques to improve surgical outcomes for people in my situation."

Education – Inaugural Cardiac Nurses Education Day

Ms. Cassy Board (Strathfield Private Hospital), Ms. Michelle Sloane, Executive Director – The Baird Institute and Mr. Matthew O'Sullivan (St Jude Medical)

The Baird Institute's first Cardiac Nurses Education Day focused upon the surgical care of patients requiring cardiac intervention and included four rotating workshops to enable small group learning in conjunction with a focus on patient-centred care. The day was designed to provide practical and informative updates on the management and care of patients in the perioperative and post-operative period.

The event was held on Saturday 28th November 2015 through the support of The Baird Institute and Strathfield Private Hospital. Nurses from Strathfield Private and Royal Prince Alfred Hospitals participated in the event. Major sponsors for this occasion were Strathfield Private Hospital and St Jude Medical.

The Baird Institute wishes to extend its thanks to Ms. Cassandra Board who helped organise the day and to the key speakers who made the day such an exciting and informative event. These experts included the Chairman and Board members of The Baird Institute speaking from their cardiothoracic and research expertise, The Baird Institute's doctoral fellows, and registered nurses with expertise in patient care, management and critical problem-solving.

Guest speakers from The Royal Prince Alfred Hospital, Concord Repatriation General Hospital and from St Jude Medical helped make the day a successful and productive event.

Presentations discussed major surgical procedures, complications from cardiac and lung disease encountered during the perioperative and post-operative period and current treatment modalities.

Subject matter ranged from the latest in robotic surgery, use of innovative materials to improve surgical outcomes and advances in technology that improve cardiac surgical techniques.

Four workshops were presented for all attendees to experience smaller group discussion and to have input from radiology, surgery, nursing and trade company specialists. A wet lab was held for pig heart dissection and anatomy and physiology review, as well as chest x-ray interpretation, management of emergent chest re-opening in critical care and the use of intra-aortic balloon pump for patient survival.

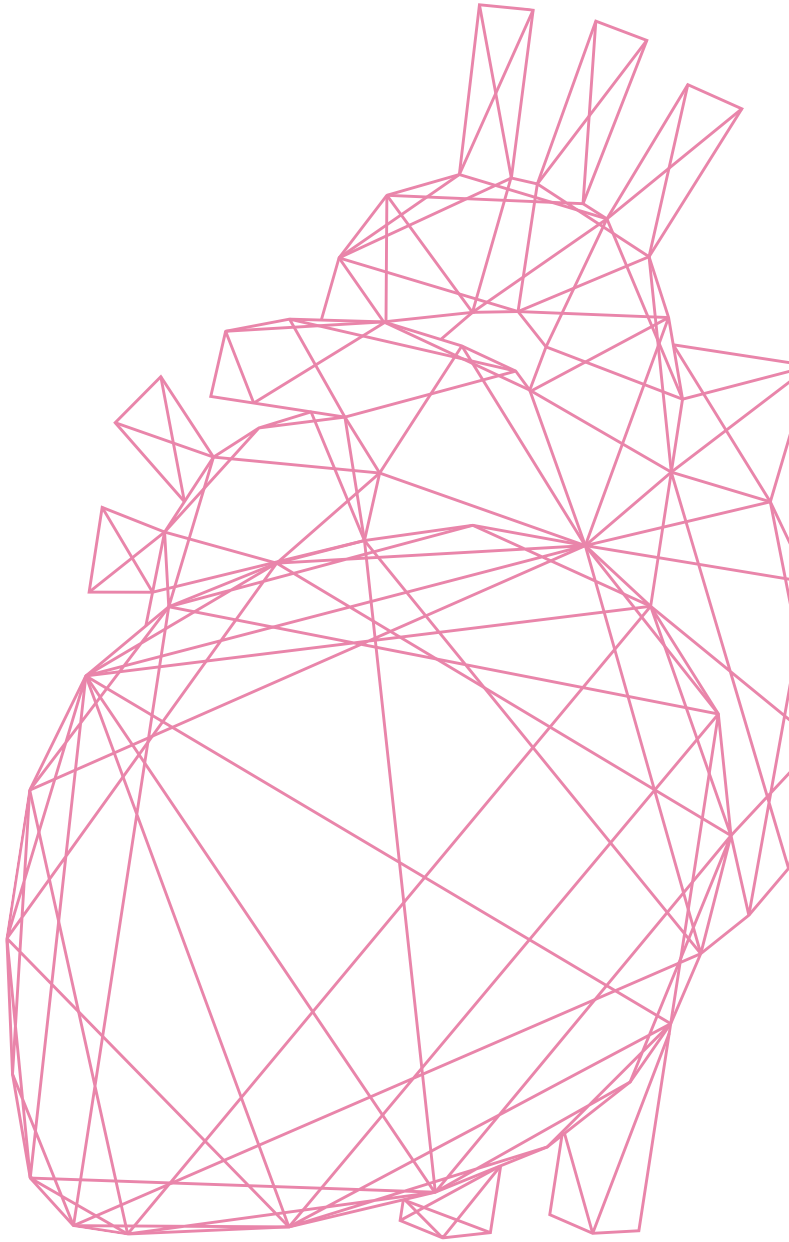
A consumer perspective was heard with a discussion of unanticipated psychological effects of surgery, including the management of depression despite a successful surgical outcome. Mr. Phillip Koperberg, the well-known former Australian politician and Commissioner of the New South Wales Rural Fire Service (RFS) in Australia (1997–2007), spoke about his own personal experiences after cardiac surgery – a discussion which resonated with operating theatre, intensive care and cardiac ward nurses.

Presentations discussed major surgical procedures, complications from cardiac and lung disease encountered during the perioperative and post-operative period and current treatment modalities.

Professor Paul Bannon at a skills training session with wet lab.

Sixty-three delegates were registered for the event from perioperative nursing, critical care and cardiothoracic surgical departments. This presented a challenge for the organisers to ensure that the sessions appealed to the three different areas of expertise in cardiac nursing. Forty-three survey responses were received at the conclusion of the day; a response rate of 73%.

Continuing Professional Development certification (CPD) was obtained through the Australian College of Nursing, providing a professional and documented approach to acknowledging the content delivered to participants. Overall the Cardiac Nurses' Education day was deemed a success by both participants and organisers. This biennial event will be held later in 2017 and will be open to perioperative, intensive care and ward-based nurses.



Global Impacts – Launch of The Kenyan Fellowship

The Kenyan Cardiothoracic Surgical Trainee Fellowship was launched at the Royal Prince Alfred Hospital Reunion Week, 2-4 September 2015. The fellowship aims to raise funds for an ongoing rolling fellowship to support a two year registrar placement at The Royal Prince Alfred Hospital. The Baird Institute and the University of Nairobi are working together in this venture to help support cardiothoracic surgery capability within Kenya.

Kenya lies between Somalia to the East, Ethiopia to the North, Sudan to the northwest, Uganda to the West and Tanzania to the South. The economy of Kenya, at present, depends mainly on agriculture (tea, coffee, dairy produce, meat, sisal, pyrethrum) and tourism. Kenya's population is about 38 million with a concentration in the central and western parts of the country. The northern and north eastern parts of the country have sparse population due to the semidesert climatic conditions.

There has been an exponential rise in cardiovascular disease in Kenya and it is soon to become the nation's largest health problem in the next decade – placing a significant strain on the health care system, as well as the Kenyan economy as a whole. Ideally, the ratio of cardiothoracic surgeons to the population is said to be around 1: 160,000. In Kenya it is a staggering 1: 500,000 (perhaps 78 cardiothoracic surgeons for the nation).

Kenya commenced a cardiovascular and thoracic surgical training program in 2012 and successful trainees from this program are awarded a Master of Medicine in Thoracic and Cardiovascular Surgery.

However, in a developing country there are some gaps in exposure to critical aspects of cardiothoracic practice which underpin the development of an effective and sustainable Kenyan cardiothoracic surgical service.

The Fellowship will allow trainees who have completed their local training, to come to Australia – with the first trainee program currently being organised. The Baird Institute has launched the Kenyan Fellowship Campaign in order to provide a sustained approach to funding trainees to study this exacting form of surgery and to further the training programs clinically within Nairobi and Kenya.

Professor Paul Bannon with cardiac surgical colleagues at the Medical School of Nairobi, Kenya.

Teaching at the Medical School of Nairobi in Kenya

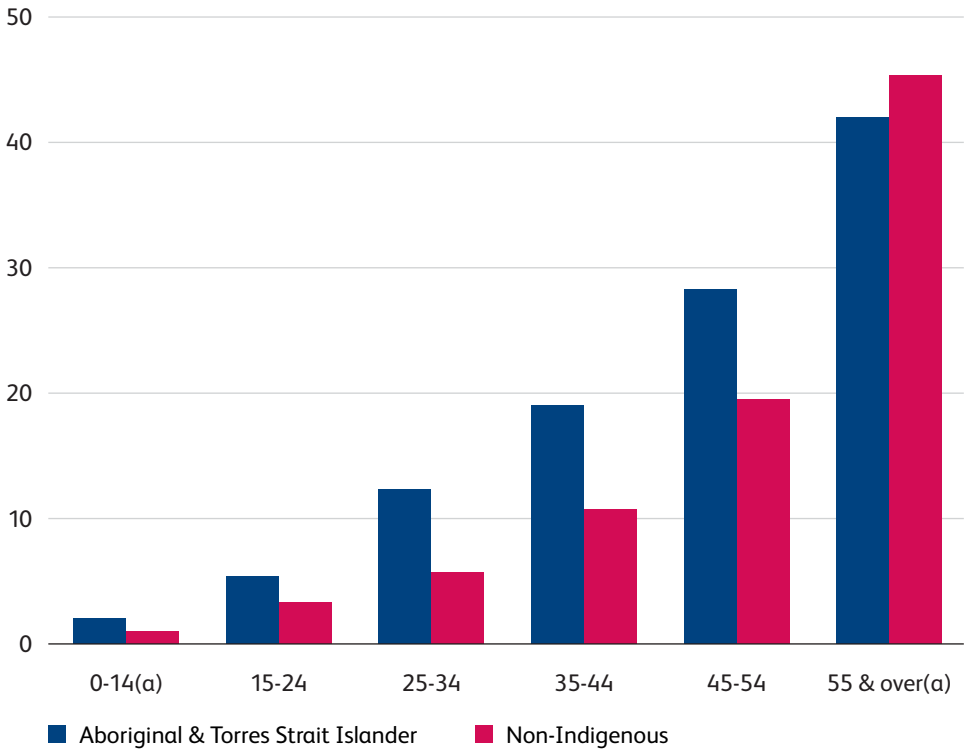
The Baird Institute and Indigenous Communities

Cardiovascular disease (CVD) is an overarching term used to describe a group of diseases that affect both the heart and blood vessels. The most common forms affecting Australians is coronary artery disease (which includes angina and heart attack), stroke, and high blood pressure. High blood pressure also results in kidney disease. Factors that affect the heart and blood vessels and cause disease include smoking (both smoking and exposure to second hand smoke), high cholesterol, being over-weight, a lack of exercise, poor nutrition and diabetes.

Many Aboriginal and Torres Strait Islanders either have CVD or are affected by CVD. The statistics for CVD show a rate of disease that is multifactorial in development, and is complicated by the need for advanced care to often remotely living Australians. One in twenty Aboriginal and Torres Strait Islander people have reported having high blood pressure and one in 25 have had heart, stroke or vascular disease or a combination of these (Australian Aboriginal and Torres Strait Islander health survey 2012-2013). These heart and related conditions occurred 1.2 times more often for Indigenous people than for non-Indigenous people. Indigenous people are more likely to die from CVD when they are young or in middle age than non-Indigenous people.

In 2009-2010 in NSW, QLD, WA, SA and the NT, the death rates for all coronary heart disease (the leading cause of CVD-related deaths) were seven to thirteen times higher for Indigenous people in the 25-39 and 40-54 years age-groups than the rates for their non-Indigenous counterparts.

Indigenous to non-Indigenous prevalence of CVD by age



(Australian Bureau of Statistics, 2013).

Sydney Local Health District (LHD), clinicians from Royal Prince Alfred Hospital and medical professionals from The Baird Institute are involved in addressing cardiovascular and cardiothoracic needs of Aboriginal and Torres Strait Islanders; as a direct health care approach for Indigenous people accessing Sydney LHD healthcare or through resources developed by the Australian Department of Health and through individual philanthropic work.

Some key developments to improve Indigenous Australian cardiovascular health includes:

- The National Chronic Disease Strategy for all Australians, which recognises the need to value cultural differences of Indigenous Australians and overcome barriers to accessing health care.
- The Rheumatic Fever Strategy which aims to prevent and treat oral and bacterial causes of the disease which result in heart valve failure
- Cardiac geographic information system project, which provides primary care services, including cardiac rehabilitation, matched to areas of cardiac disease prevalence.
- Medical specialist outreach assistance program, which is funded by the Australian Department of Health to improve Indigenous peoples' access to specialist medical services when living in rural and remote regions of Australia
- Indigenous chronic disease fund, which aims to target three areas of priority to prevent and reduce the disease burden of CVD; including tackling risk factors, identifying services that can deliver results and fixing the gaps and improving the person's journey through the health care system.

Conference Presentations

RPA Medical Officers Association 81st Annual Reunion Week

The RPA Medical Officers Association in partnership with the RPA Institute of Academic Surgery and The Baird Institute held Reunion Week from 2-4 September 2015.

Professor Paul Bannon spoke with the Sydney LHD media centre after Reunion Week, recapping the Session on Global Health and said that less than 10 per cent of the world's population has access to surgical care considered routine in Australia. Innovative strategies to help address this disparity was the focus of one session at the 81st RPA Reunion Week Symposium held in early September.

"We're moving away from the model in which a surgeon flies in, performs a surgery and flies out" said RPA's head of cardiothoracic research, Professor Paul Bannon.

"The experts we've invited to speak in this session have different approaches, but all are working to develop the skills and education for surgeons who live in these regions and can continue to provide care in their own communities."

Associate Professor Michael Hollands presented his experience of working in Myanmar and other parts of Asia, Dr Nyambura Mwaniki spoke regarding the Surgical Knowledge Exchange program in Kenya and Associate Professor Kelvin Kong discussed challenges in surgical treatment for Australia's Indigenous population.

"In many ways, what we're doing overseas mirrors what we're doing in remote Aboriginal and Torres Strait Islander communities, although the existing infrastructure and challenges are different" Professor Bannon said.

Chairing the symposium's session on global health, Professor Bannon shared his insights from several educational visits to East Africa, where increasingly westernised diets are resulting in much higher rates of cardiovascular disease.

"There are lots of ways we can, and do, help, including operating alongside surgeons in training, providing curricula and setting up training the trainer programs," Professor Bannon said.

The Baird Institute has established a scholarship program with the Nairobi University to help develop cardiac surgeons in Kenya and a fundraising event to support the initiative was held immediately after the session on global health in the picturesque Fountain Courtyard of the Kerry Packer Education Centre.

The patron of The Baird Institute, Dame Professor Marie Bashir opened The 81st Annual Reunion Week, which included speakers from The Baird Institute such as Dr. Michael Seco presenting 'Medical student experience' and participating in a speaker panel following the session, Dr. Michael Byrom helped co-facilitate a workshop at the event with Professor Scott LeMaire, entitled 'Laboratory Research', which discussed and demonstrated laboratory research techniques used by RPAH surgeons including side stream dark field imaging, microCT, biocompatibility assessment, animal models, and more! Professor Bannon helped facilitate panel discussions on the topics of surgical research and opportunities to conduct this research in medical research institutes, which was chaired by Dr. Michael Byrom.

The week-long event culminated in a ‘Question-Answer’ event hosted by Tony Jones from television’s ABC show ‘Q&A’. Panel members included The Baird Institute’s Professor Paul Bannon as well as The Honourable Michael Kirby AC CMG, Mr. Mikey Robins, The Honourable Carmel Tebbutt, Professor Catharine Lumby, Dr. Teresa Anderson, Chief Executive for Sydney Local Health District, Professor Tim Pawlik (McIlrath Professor) and Professor Michael Solomon. The panel discussed the topic of “The Well Rounded Surgeon: Balancing gender, work with life and patient expectations”.

Prizes

The President’s Prize for Laboratory Research was open to all Junior Medical Officers, Allied Health and Nursing staff who were encouraged to submit an abstract for The Patron’s Prize for Clinical Research and the new President’s Prize for Laboratory Research. The top three abstract submissions in each prize category enabled their presenters to give a 10 minute presentation in front of an esteemed panel of judges from RPA Reunion Week. Prizes were awarded based on the quality of science, the clarity of the presentation and the participant’s response to questions. Prizes included $1 000 prize money and an iPad sponsored by The Baird Institute and Surgical Outcomes Research Centre (SOuRCe).

Royal Prince Alfred Hospital – main entrance.

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The Baird Institute – Board And Administration

Professor Paul G. Bannon
MBBS PhD FRACS
CHAIR

Professor Paul Bannon is the Chair of The Baird Institute for Applied Heart and Lung Surgical Research. He is Head of Department, Cardiothoracic Surgery at Royal Prince Alfred Hospital, Sydney and holds the Chair of Cardiothoracic Surgery and the Bosch Chair of Surgery, University of Sydney. He has performed over 2500 adult cardiac surgical procedures ranging from coronary artery bypass to complex aortic root and arch reconstructions. He is the immediate past President of the Australia and New Zealand Society of Cardiac and Thoracic Surgeons and is the Society representative to the Cardiac Surgery National Database. He is the Co-Chair of the Institute of Academic Surgery at RPAH where he also oversees the robotic surgical program. He heads the National MBS Taskforce Review for Cardiac Surgery and has held various positions in the Royal Australasian College of Surgeons and Royal Prince Alfred Hospital.

Professor Bannon's teaching responsibilities are currently to all years of the Graduate Medical Program at Sydney Medical School, University of Sydney. He supervises local and international Doctorate, Masters and Honours students as well as international elective students. He is the Co Editor-in-Chief of The Annals of Cardiothoracic Surgery and a Director of the CORE Group for International Collaborative Research. Professor Bannon has published widely in books, journals and conference proceedings on cardiothoracic surgery, basic science and evidence based medicine.

He has a particular passion for translational research in the areas of congenital aortic and mitral valve disease, hypertrophic cardiomyopathy, biomaterials and biocompatibility, limitation of blood product usage in cardiac surgery, the inflammatory response to bypass and the development of academic surgical careers. He is a current Chief Investigator on NHMRC and NHF grants for biomaterials and congenital heart disease research as well as a current NHMRC CRE grant on mechanical circulatory support. His role in the CRE is to produce NHMRC Clinical Practice Guidelines and measure their dissemination, adoption and outcomes. He personally oversees more than $500,000 worth of research funding annually. His department currently runs 16 clinical trials amongst many other laboratory and clinically based projects.

Professor Michael K. Wilson
MBBS FRACS

Professor Michael Wilson has clinical appointments at Royal Prince Alfred, Concord Repatriation General, Strathfield Private and Macquarie University Hospitals. Professor Wilson has a special interest in the utilisation of emerging technologies and minimally invasive techniques to deal with complex heart and lung surgical problems. He holds an academic appointment at Macquarie University and has extensive experience in clinical and basic science research. He is a board member of The Baird Institute for Applied Heart and Lung Surgical Research.

Professor Wilson has a wide and varied interest in all aspects of cardiothoracic surgery, including total-arterial coronary artery bypass surgery, anaortic off-pump coronary artery surgery, ventricular remodelling surgery (SVR), minimally invasive (including Da Vinci robot) heart (MICS) and lung (VATS/MITS) surgery, complex aortic root, arch and thoracoabdominal aortic surgery, transcatheter aortic valve surgery (TAVI), pulmonary thromboendarterectomy surgery, and surgery for lung cancer. He has presented extensively at national and international conferences and authored or co-authored more than 70 publications in peer-reviewed journals.

Professor Wilson has an international reputation for applying new technologies to complex surgical problems of the heart and lung. He is sought-after for his expertise in managing patients with complex problems. He has been involved in several 'first-in-human' procedures and is a great advocate for teaching the next generation of surgeons to think outside the square and be innovative.

Professor Michael P. Vallely
MBBS PhD FRACS

Professor Michael Vallely is a leading cardiothoracic surgeon with clinical appointments at Royal Prince Alfred, Concord Repatriation General, Strathfield Private, Macquarie University, The Mater and Southern Highlands Private Hospitals. Professor Vallely has a special interest in elderly and high-risk patients with multiple medical issues, and minimally invasive heart and lung surgery. He holds Clinical Professorships at the University of Sydney and Macquarie University. He is a member of the Board for The Baird Institute for Applied Heart and Lung Surgical Research and of the Royal Australasian College of Surgeons Cardiothoracic Board.

He is the leader of The Baird Institute's Innovative Heart Surgery research group and supervises a clinical and basic research team of Honours, Masters and Doctoral students and is a member of the Board of the Royal Prince Alfred Institute for Academic Surgery.

Professor Vallely has clinical and academic interests in minimising the invasiveness of cardiothoracic surgery and is a world authority on total arterial, anaortic, off-pump coronary artery bypass surgery. He also has interests in minimally invasive cardiac surgery (MICS and Da Vinci robotic surgery), transcatheter (TAVI and Mitra-Clip) cardiac surgery, thoracic aortic surgery, geriatric cardiac surgery and hybrid procedures including the use of ECMO. Professor Vallely has a special interest in electrophysiological (pacemakers, defibrillators and CRT) devices and performs more than 250 implants per year. He has presented extensively at national and international conferences and authored or co-authored more than 75 scientific publications in peer-reviewed journals.

Professor Clifford F. Hughes
AO MBBS FRACS FACC FACS FCSANZ

Professor Cliff Hughes is President of the International Society for Quality in Health Care. Until March 2015 he was the Chief Executive Officer of the Clinical Excellence Commission, a statutory health corporation established in 2004 to build capacity and design programs to promote and support improvement in quality and safety for health services across NSW.

He has been chairman or member of numerous Australian state and federal committees associated with quality, safety and research in clinical practice for health care services. He has held various positions in the Royal Australasian College of Surgeons, including Senior Examiner in Cardiothoracic Surgery and member of the College Council. In November 2015 the College bestowed upon him the highest award given to a Fellow in his lifetime, the Sir Hugh Devine Medal. He has received awards for his national and international work including an Alumni Award from the University of NSW. He has led five medical teams to China and has performed cardiac surgery in Hong Kong, Singapore, Malaysia, India and Bangladesh.

In 1998, he was made an Officer in the Order of Australia (AO) in recognition of his contributions and "service to cardiac surgery, international relationships and the community". In June 2014, the University of NSW conferred upon him the degree of Doctor of Science, its peak academic award.

Ms Michelle Sloane
BA MA MBA CMAHRI MAPsS
EXECUTIVE DIRECTOR

Michelle has been the Executive Director of The Baird Institute since 2008. Reporting to the Board, she is responsible for strategy and operational leadership, in order to achieve the mission of "funding research and applying science to improve the quality of life of all patients facing heart or lung surgery". The role requires the ability to build relationships with a diverse

range of community, corporate and government stakeholders, as well as management of the team, including volunteers.

Michelle's background is in psychology and human resources working for many years in senior executive positions at Westpac, IBM and Unilever. Twenty years ago she established a human resources management consulting practice, Diversity Management, and led that organisation for 16 years. Michelle has worked extensively in the areas of change management, organisational analysis and design, human resource management, program management and stakeholder engagement as well as leadership development and training.

Michelle has a Master of Business Administration from the University of Technology, Sydney, a Master of Arts (Psychology) from the University of Sydney and a Bachelor of Arts from the University of New South Wales. In addition Michelle is a Graduate of the Institute of Company Directors (GAICD).

Michelle is also a Councillor for the City of Willoughby in Sydney. During her time as Councillor and Deputy Mayor, she has worked tirelessly with the local community advocating across a range of local and state wide issues. Her interest in local government was developed over many years as an active volunteer in her local community.

Ms Joanne Wade

BEc LLB

Joanne Wade has been a plaintiff lawyer since her admission to the Supreme Court of NSW in 1996 and has worked in asbestos litigation for over 18 years. Joanne is an Accredited Specialist in Personal Injury Law and prides herself on her communication with her clients and, on many occasions, her clients' families. She understands the importance and need to handle all her cases with the utmost diligence and compassion.

Joanne has acted for hundreds of people suffering from mesothelioma, lung cancer, asbestosis and asbestos related pleural disease. Her clients are everyday people who have worked hard all their lives and deserve justice. Joanne acted for Steven Dunning in his claim against BHP Billiton Limited in the Dust Diseases Tribunal of NSW (Dunning v BHP Billiton Limited [2014] NSWDDT 3). Joanne has also successfully acted for the late Bevan McGrath in his claim against Allianz Australia Insurance Limited, for his condition of asbestos related pleural disease. Mr McGrath went on to develop mesothelioma, one of only a small number of cases where he then brought a second claim for further damages because his first claim was resolved on a provisional basis. Joanne successfully acted for Mr McGrath in both his claims and the late Mr McGrath successfully received further damages in a judgment by the court (McGrath v Allianz Australia Insurance Limited [2011] NSWDDT).

"It is a great privilege to work with people suffering from asbestos illnesses, and the greatest satisfaction formed is securing a result for those people to help ease their suffering, and to know their families will be looked after." Joanne takes great pride in the work Slater and Gordon have undertaken in representing victims of asbestos disease, unions and asbestos support groups.

Prof Jeffrey Braithwaite

BA MIR MBA PhD FAIM FCHSE

Professor Jeffrey Braithwaite, BA, MIR (Hons), MBA, DipLR, PhD, FAIM, FCHSM, FFPHRCP (UK), FAcSS (UK), is Foundation Director, Australian Institute of Health Innovation, Director, Centre for Healthcare Resilience and Implementation Science, and Professor of Health Systems Research, Faculty of Medicine and Health Sciences, Macquarie University. His research examines the changing nature of health systems, attracting funding of more than AUD$90 million (EUR€58 million, GBP£45 million).

He has contributed over 600 total publications, presented at international and national conferences on more than 800 occasions, including 80 keynote addresses. His research appears in journals such as British Medical Journal, The Lancet, Social Science & Medicine, BMJ Quality and Safety, and International Journal of Quality in Health Care. He has received numerous national and international awards for his teaching and research.

He is interested in the Anthropocene and the impact of human activity on human and species' health, population and climate. He blogs at http://www.jeffreybraithwaite.com/new-blog/.

Further details are available at his Wikipedia entry: http://en.wikipedia.org/wiki/Jeffrey_Braithwaite.

In Australia, diseases of the heart, lung and blood vessels kill more people than any other disease. These diseases can affect people of any age at any time.

Dr Michael Byrom

MBChB GradDipSurg PhD FRACS

Doctor Michael Byrom is a cardiothoracic surgeon with specialised training and experience in minimally invasive aortic valve replacement; aortic surgery, mitral valve repair; all-arterial coronary bypass surgery, surgical left ventricular remodelling, and minimally-invasive thoracic surgery including VATS lobectomy.

Dr Byrom undertook his PhD with The Baird Institute and since completing his training has worked extensively at the Bristol Royal Infirmary, focusing upon techniques in minimally invasive cardiac and thoracic surgery and gaining considerable experience performing aortic root and arch replacement, mitral valve repair, and left ventricular remodelling procedures.

Dr Byrom's PhD studies at the University of Sydney, completed in 2013, involved a multidisciplinary project between the departments of cardiothoracic surgery, cardiology, biochemistry and physics, to produce two entirely new conduits for use in vascular bypass surgery. This has led to further insights into the design and optimal use of small and large-diameter conduits for coronary artery bypass and aortic surgery as well as other biomaterials in use in cardiothoracic surgery.

At the same time as his PhD studies, Dr. Byrom also undertook a Graduate Diploma in Surgery focused on biostatistics and epidemiology, and his research interests include the design of laboratory methods and animal models to advance translational research and bring bench side developments into clinical practice.

Mr Shaun Clyne

MA LLM (Syd)

Shaun is a corporate lawyer based in Sydney. He is the Australian Head of the Mergers & Acquisitions practice at Norton Rose Fulbright. He regularly advises on a wide range of corporate and securities law issues for public listed companies including takeovers, schemes of arrangement and capital raisings. He advises on Australian Stock Exchange compliance matters and regularly acts for both bidders and targets in connection with takeover bids and schemes of arrangement (hostile and friendly) for ASX-listed companies.

A leading practitioner in equity capital markets, Shaun has also advised numerous companies on their initial public offerings and capital raisings (rights issues, AREO's, placements, employee share and options plans). Shaun has presented at a variety of seminars and conferences and published several papers in his areas of specialisation. His areas of expertise are mergers and acquisitions, corporate advisory and capital markets.

Professor Richmond W. Jeremy

MB BS PHD FRACP FAHA FESC FCSANZ GAICD

Professor Richmond Jeremy's medical and cardiology training were at the University of Sydney and Royal Prince Alfred Hospital.

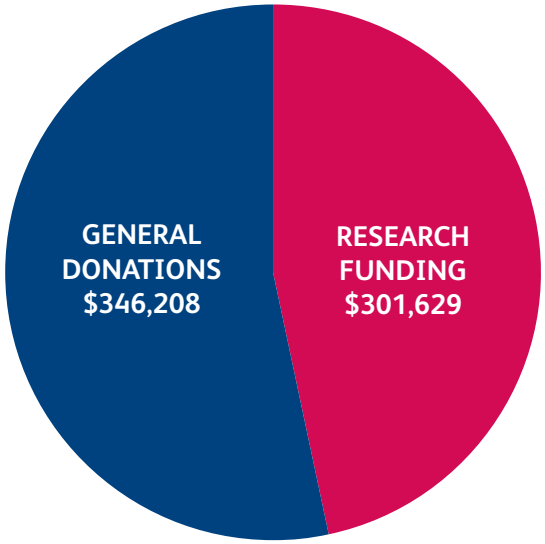
His clinical research career includes a PhD on coronary physiology and a post-doctoral research Fellowship at Johns Hopkins Hospital, Baltimore before returning to the University of Sydney and Royal Prince Alfred Hospital. His University of Sydney responsibilities have included service as Associate Dean Sydney, Medical School, Head of Central Clinical School and Pro Vice-Chancellor, Campus Infrastructure and Services.

Professional responsibilities have included service as Editor-in-Chief of Heart Lung and Circulation, membership of Boards on National Heart Foundation (NSW), Royal Australasian College of Physicians (Adult Medicine Division) and Cardiac Society of Australia and New Zealand.

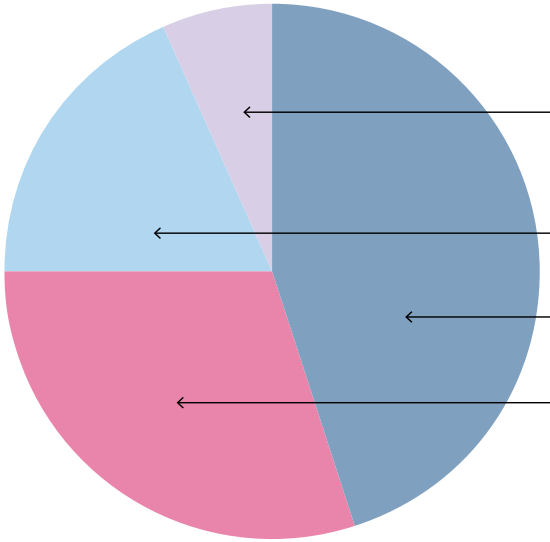
Operations Report

2016

Income



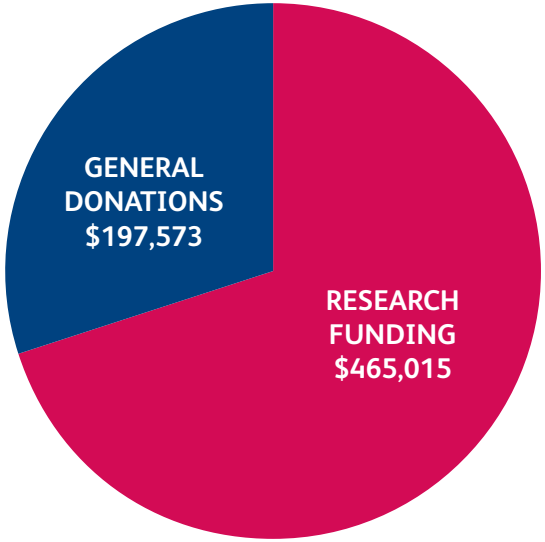
Expenses



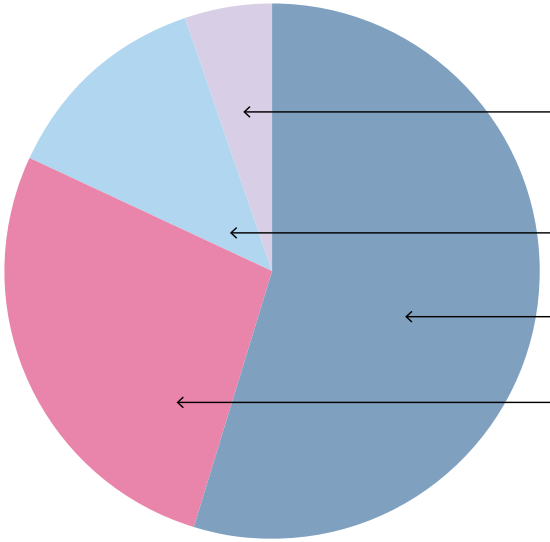
Premises	$38,103
Research Administration & Clinical Trials	$107,498
Research	$265,088
Administration	$178,193

2015

Income



Expenses



Premises	$34,324
Research Administration & Clinical Trials	$86,846
Research	$371,818
Administration	$185,733

Our Supporters

Our Donor Morning Tea was held most recently at Vaucluse House Tea Rooms on Thursday, 12 May 2016. Over 80 guests attended, most of whom have supported The Baird Institute for many years. It was a wonderful opportunity to meet fellow donors and enjoy a delicious morning tea at one of Sydney's most beautiful historic homes.

Guests were joined by Professor Paul Bannon (our Chairman), who provided an update on The Baird Institute's latest research. It was also a chance for The Baird Institute's team to thank some of the many people who help make our important work possible.

After the presentation, guests enjoyed a tour of Vaucluse House and a walk around the beautiful surrounding gardens.

Over 80 of our generous donors joined Professor Paul Bannon and The Baird Institute team for morning tea at Vaucluse House.

We gratefully acknowledge all of our supporters who do so much to assist us in many different ways, however we would particularly like to thank our principal supporters; St Jude Medical, Medtronic and Edwards.

ST. JUDE MEDICAL

Edwards

Medtronic

Events

'The Loft 'at Jones Bay Wharf was the location for the annual Christmas event in 2015, where the Board and Researchers from The Baird Institute were able to host supporters of The Baird Institute and thank them for their contribution to research, research funding and better outcomes for people requiring heart and lung surgery.

In 2016, the Christmas event was held at the Woolloomooloo Bay Hotel and a new style of evening function was introduced to acknowledge our donors and the work of our researchers. The Baird Institute hosted an evening conversation with Ms Monica Attard, the award-winning Australian journalist and head of the Faculty of Journalism at Macleay College. Monica interviewed Doctor James Edelman and Professor Paul Bannon about the challenges for heart and lung surgery and research in the 21st century. The interview was a huge success enabling the audience to hear more about the issues of research and those specifically relating to surgical heart and lung research.

Prof Bannon, Dr James Edelman and Monica Attard in conversation at the Woolloomooloo Bay Hotel and below, Executive Director Michelle Sloane

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Applied heart & lung surgical research

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