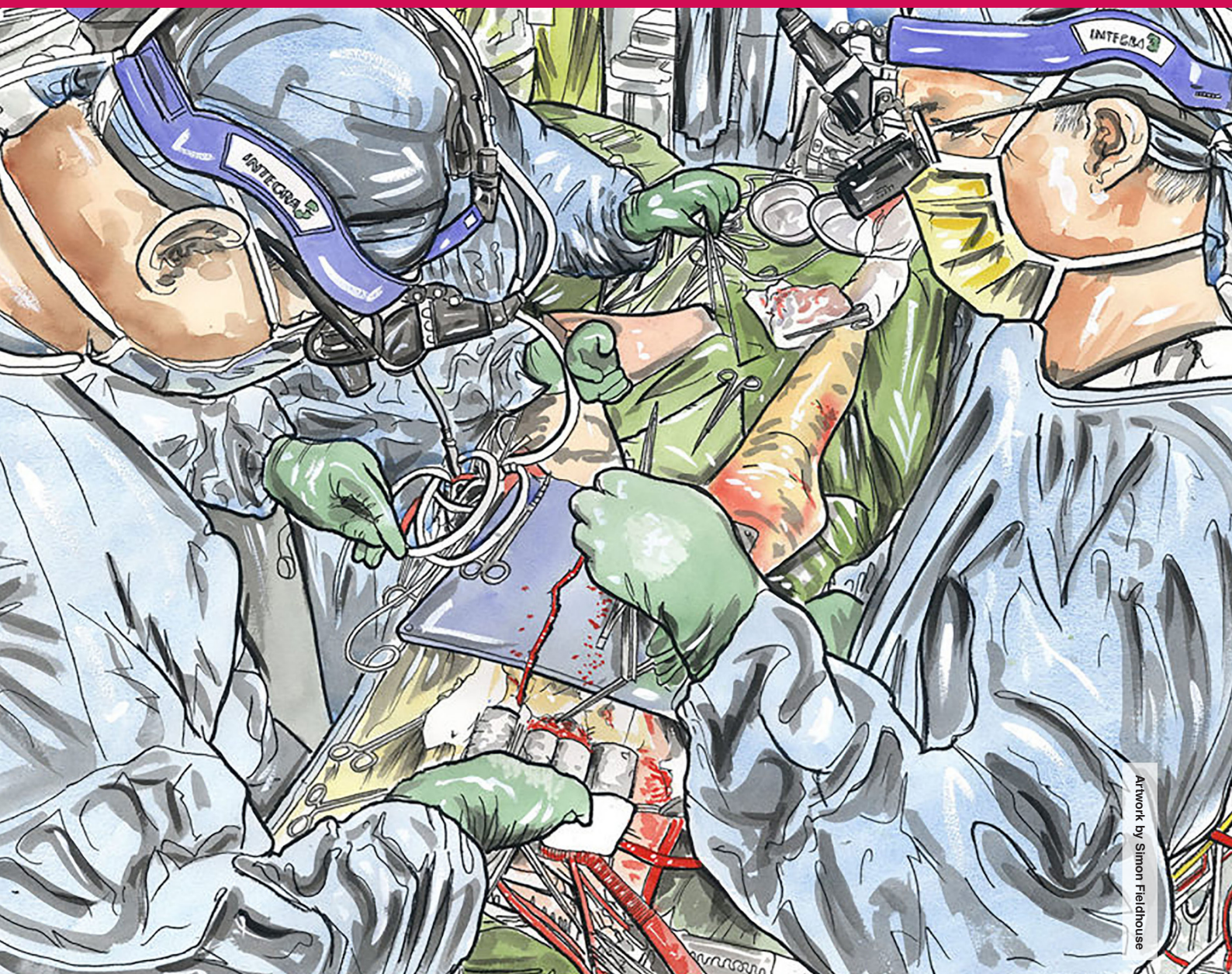




THE BAIRD INSTITUTE

Applied heart & lung surgical research



**ANNUAL REPORT
FINANCIAL YEAR 2022**



A MESSAGE FROM OUR PATRON,

The Hon. Michael Kirby AC CMG

Reflections On Independent Research

At the time of writing, we are adjusting in Australia to a change of federal government. Without commenting on the politics, we can rejoice that we live in a country where governments are changed periodically and peacefully by the decision of ordinary citizens.

Doug Baird and I both won Commonwealth scholarships at school. They were conceived by the Chifley Labor Government and implemented with enthusiasm by Prime Minister Menzies of the Coalition Parties. They strengthened Australia's universities by opening the doors to young people, like Doug and I, who were raised by parents of modest means.

In recent years, many universities, institutes and academies in Australia have felt that our federal government was hostile to funding them wholeheartedly and supporting original research. Doug Baird was not only a magnificent surgeon, he was also a dedicated performer in original research. This included research on topics without any immediate financial reward. Researchers, if they are rewarded at all, receive rewards a long way down the track. True to the memory and dedication of Doug Baird, the Baird Institute has been heavily engaged in research. The recognition of its Chair, Professor Paul Bannon, as the "Top Researcher in the Field of Cardiology" acknowledges his research. In this, he and his colleagues are walking in the footsteps of Doug Baird.

Many people, including myself, hope that the incoming Government of Australia will cease hostility, sometimes evident in the recent past, towards independent research, universities, academies and research Institutes. We need to protect the funding and the independence of researchers. Only in this way will Australia remain in the first rank of global research, including in cardiothoracic specialties. I am proud that this report records top drawer research, education and up and coming professionals. How proud Doug Baird would be of the Institute that bears his name. And of how top scientists whom he never knew personally, carry forward his legacy and inspiration

This year, 2022, is the 21st anniversary of the establishment of The Baird Institute. We look forward to celebrating this milestone, in a properly festive way in the presence of our team and its wonderful supporters.

Vivid recollections of our founder, Doug Baird in the early days will be included in the celebrations. I had known him in university days where he stood out for his brilliance and innovation. This report will contain a patient's memories of Doug Baird, the surgeon. My mother, Jean Kirby, was one of his early bypass patients. How revolutionary his techniques seemed in those days!

Earlier this year, the new Vice-Chancellor of the University of Sydney, Professor Mark Scott AO, organised a splendid public conversation with Professor Sean Lal, a director on the board of The Baird Institute, who described his work at the Sydney Heart Bank.

Patrons sometimes get closer to their commitments than they necessarily expected. I myself will undertake a renewal of my 2005 CAGS procedure and also replacement of my aortic valve in 2021. This is the ultimate tribute to the early initiatives of Doug Baird and colleagues at the Page Pavilion decades ago. What was then often experimental, is now established surgical practice. But the needs of first-rate data, research and clinical practice remain at the forefront of the legacy Doug Baird and his colleagues bequeathed to us. We must maintain and strengthen this legacy.

A handwritten signature in blue ink, which appears to read "m. kirby".



A MESSAGE FROM OUR CHAIR

Professor Paul Bannon MB BS, FRACS, PhD

We continue to focus as always on the areas of research that can be expanded so as to support the different surgical programs we have in the Cardiothoracic Department at Royal Prince Alfred Hospital. Our pillars of research are outlined below.

Clinical Trials: Our clinical trials were significantly impacted by COVID but the team have worked extremely hard to try to keep the trials going in both the public and the private institutions. The key areas are on blood transfusion practices (the continuations of the TRICS 3 trial into TRICS 4) as well as the new CLIP 2 trial on cryopreserved liquid platelet transfusions. These two trials will really add significantly to the international literature and the management of transfusion practices in major cardiac surgery around the world.

Bio-banking Program: Some of the bio-banking was also impacted by COVID but despite that our strategy in this area has really come to maturity this year

with the joining of the aortic biobank and the cardiac muscle biobank. The biobank is already beginning to generate some basic science projects in the Charles Perkins Centre in the area of heart failure in conjunction with Dr Sean Lal and Dr John O'Sullivan. We have also been able to continue our support for the vascular surgical department at RPAH by helping them to develop their biobanking strategy.

Broken Heart Program: We have wrapped up all of our experimental work for the Broken Heart Program and chief researcher, Dr Laurencie Brunel, is preparing to submit her thesis and the third and final publication in that area of work. For this program, we have predicted and modelled individualised surgical corrective techniques. We then test the model in the research theatre by looking at the structural integrity of the repair. This research work sets the scene for what we want to do in this area in the future. We have also put in an application for a collaboration with Stanford University in the USA and we are waiting to hear the result of this.

Surgical Outcomes Program: The Centre for Health Record Linkage (CHeReL) links multiple sources of data and maintains a record linkage system that protects patient privacy. Data linkage transforms routinely collected data into a powerful resource for research and evaluation. Our Clinical Trials team has submitted the data for 12,500 patients to the CHeReL system. This data on long-term follow-up and reintervention rates, will give us the answers to our questions on comparative surgical strategies and how well we have done over the years.

Innovative Robotics: This has had to take a back seat during COVID as the lab in the Charles Perkins Centre has been shut down for a large part of the first 6 months of this financial year. The lab has re-opened this year so planning for further research in this area is now well underway.

The Baird Institute is currently providing support for two research staff members: Cassandra in the biobanking program and Dhairya in the cardiothoracic research office. These two positions provide an excellent link between the surgical outcomes and the biobanking programs, both of which are inextricably linked. In addition, Dhairya will be assisting with clinical governance research and clinical trials in the Cardiothoracic department.

Finally, we have made a decision to commit to the development of a translational research group in The Charles Perkins Centre and we have recently recruited Dr Robert Hume to fill a post-doctoral position. Dr Hume has an undergraduate degree in Biomaterial Science and Tissue Engineering and a PhD in pathology. He will support our higher degree research students across the different areas of interest.



A MESSAGE FROM OUR CEO

Ms Catherine Rush

We are all very excited that Professor Paul Bannon, Chair of The Baird Institute and Head of Cardiothoracic surgery at Royal Prince Alfred Hospital (RPAH), was named the top researcher in Australia in the field of cardiology by The Australian Newspaper's 2021 Research Magazine. This ranking is based on the number of citations for papers published in the top 20 journals in his field, over the past five years. Such a notable achievement for someone who dedicates much of his time, outside of surgery, to research.

You will note from the research updates in this report that we currently have a considerable focus on research into aortic disease and aortic surgery. Excitingly, we are currently in the process of recruiting a post-doctoral fellow – Dr Robert Hume - who will lead a research team in basic and translational science focusing on aortic disease and human heart failure, under the mentorship of Prof. Bannon. This team will be a unique

collaboration between the University of Sydney, The Baird Institute, and Royal Prince Alfred Hospital. The group will be headed by Professor Paul Bannon, Dr Sean Lal, A/Prof John O'Sullivan, and Professor Richmond Jeremy, who all hold dual appointments in the Faculty of Medicine and Health at the University of Sydney and at Royal Prince Alfred Hospital.

The fellow will lead a team that uses human and model system heart failure, to understand key disease processes in heart failure and aortic disease and will have access to highly sought after fresh human heart tissue biopsies from a range of cardiac diseases in the Sydney Heart Bank, at the University of Sydney. The value of this research group is that no other group has this biobank – the Sydney Heart Bank. If we have the serum as well as the tissue and we have the capacity to look at the genetic predispositions too – we are very well set up to do some ground-breaking research.

We expect that from this group there will be a number of high impact publications in top academic journals. The research of this group will be a great advancement for science. We don't even know how the aorta actually changes under normal circumstances at a molecular level and how that interacts with the heart, but with this research group we are in a position to look at this for the first time, using the resources that we have.

Finally, this year we celebrate our 21st birthday – 21 years since the establishment of The Baird Institute and how far we have come! On behalf of the Board and our research and administration teams, I would like to thank you for being a part of our journey over the last 21 years.

To every single one of our supporters, on behalf of the team at The Baird Institute, thank you for everything you make possible. None of what is mentioned in this Annual Report would be feasible without your help. We greatly appreciate your continuing trust and support.

Best Regards



GOVERNANCE

The Baird Institute is registered as a charity with the Australian Charities and Not-for-profits Commission (ACNC). Eligible tax-deductible donations have Deductible Gift Recipient (DGR) status with the Australian Taxation Office.

WHO WE ARE

Established in 2001, The Baird Institute is the only dedicated cardiothoracic surgical training and research institute in Australia. A Sydney-based charitable organisation, the institute is operated by a small, multi-skilled team and supported by a board of pro-bono volunteers.

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.

DOUGLAS BAIRD

20 JUNE 1940 – 16 NOVEMBER 1995

"There was no better exemplar of the ideals of science, surgery, sensitivity and skill than Douglas Kevin Baird" – Professor Paul G. Bannon

Professor Douglas Baird was a truly great Australian with a passion for improving heart and lung surgical techniques for the benefit of all. A young Baird developed his passion for cardiothoracic surgery whilst an intern at Royal Prince Alfred Hospital (RPAH) and later became a Fellow of the Royal Australasian College of Surgeons (RACS) in 1971. His commitment to excellence in medicine and surgery was obvious as a medical undergraduate when, at Sydney University, he also completed a Bachelor of Medical Science (BMSc) and won seven prizes including the University Medal. In his eulogy, Baird Institute patron, the Honourable Michael Kirby, described him thus: "Sweet was his nature and notable his achievements".



OUR PATRON

The Hon Justice Michael Kirby
AC CMG

OUR BOARD OF DIRECTORS

Prof Paul Bannon, MBBS PhD
FRACS, *Chair*

Prof Jeffrey Braithwaite, BA, MIR
(Hons), MBA, DipLR, PhD, FIML,
FCHSM, FFPHRCP (UK),
Non-Executive Director

Mr Shaun Clyne, MA LL.M (Syd),
Non-Executive Director

Prof Richmond Jeremy, MB BS
PhD, FRACP, FAHA, FESC, FCSANZ,
GAICD, *Non-Executive Director*

Ms Joanne Wade, BEc, LLB,
Non-Executive Director

Dr Sean Lal BMedSci (Hons),
MBBS(Hons), MPhil(Med),
PhD(Med), FRACP *Non-Executive
Director*



From left to right: Erin McMullen, Sean Lal, Shaun Clyne, Catherine Rush, Richmond Jeremy, Jeffrey Braithwaite, Paul Bannon, Joanne Wade



STAFF

- Professor Martin Misfeld - Co-Director of Research, Cardiothoracic Department, RPAH
- Ms Catherine Rush - CEO
- Ms Lorna Beattie – Clinical Trials Manager
- Ms Sue Moore – Administration and Events Manager
- Ms Julia Favotto – Donor Relations assistant
- Ms Tatum Faber – Donor Relations assistant
- Ms India Perianayagam – Administration assistant
- Mr Dhairya Vayada – Data Research Assistant
- Ms Cassandra Malecki – Postdoctoral Researcher and Biobank Manager
- Ms Erin McMullen, Company Secretary.

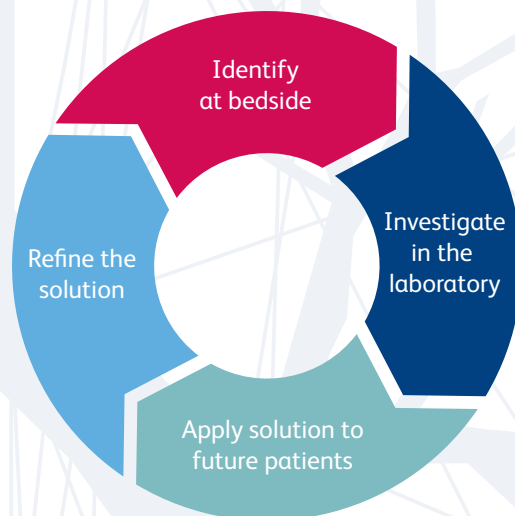
OUR VISION

Our vision is to improve the outcomes and enhance the lives of those undergoing heart and lung surgery.

OUR MISSION

The Baird Institute's mission is to foster research and apply science to improve the outcomes for patients facing heart or lung surgery. The money we raise funds research that directly improves the surgical techniques associated with heart and lung surgery. Improvements can include less intrusive procedures as well as techniques that improve survival rates.

Through our commitment to ongoing research and the application of scientific breakthroughs in technology, we can directly impact the quality of life for patients,



postsurgery and save lives that may otherwise have been lost.

Founded on the principal that academic surgeons produce better outcomes, The Baird Institute prides itself on continued investment in research and training; enabling it to remain at the forefront of innovation, surgical robotics and revolutionary industry technology.

OUR AIMS

- To Improve Patient Outcomes
- To Innovate
- To Conduct Research
- To Make Advances in Surgical Technology

NEW APPOINTEES



Mr Dhairya Vayada

DATA RESEARCH ASSISTANT

Dhairya commenced with The Baird Institute in September having recently completed his Bachelor of Biomedical Science at The University of Queensland. He has a strong interest in computer science and his goal has always been to use his computational skills in a healthcare setting. Throughout his undergraduate degree, Dhairya was extensively involved in research, working as a research assistant at the Queensland Brain Institute in the Computational, Systems and Developmental Neuroscience Laboratory. His passion for cardiothoracic research was strengthened while working at the University of Queensland Thoracic Research Centre, assisting in data management for the International Lung Screen Trial.

Dhairya says: "I was extremely fortunate to have been offered a job as a data research assistant at The Baird Institute. I am very excited to contribute to cardiothoracic surgical research and assist in ensuring the quality, integrity, and confidentiality of the research data and databases. I am also looking forward to utilising my programming skills to make research workflow processes more efficient."

The recruitment of Dhairya is another important investment in the team which supports the high-impact research conducted by our researchers. We really appreciate the generous support of our donors who have made this additional investment possible.

EDUCATION & TRAINING PROJECTS

UPDATE

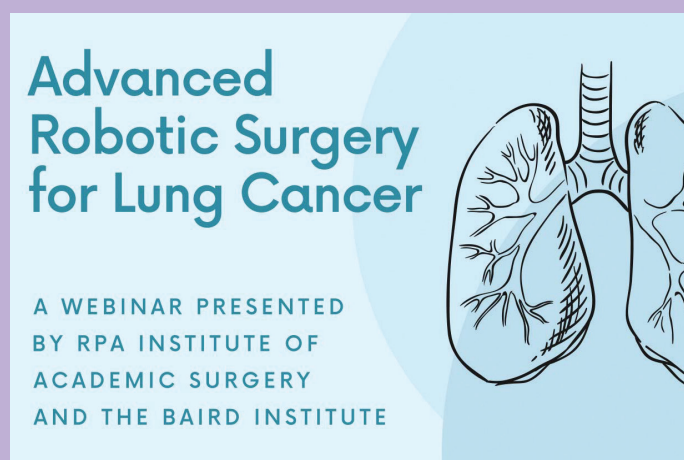
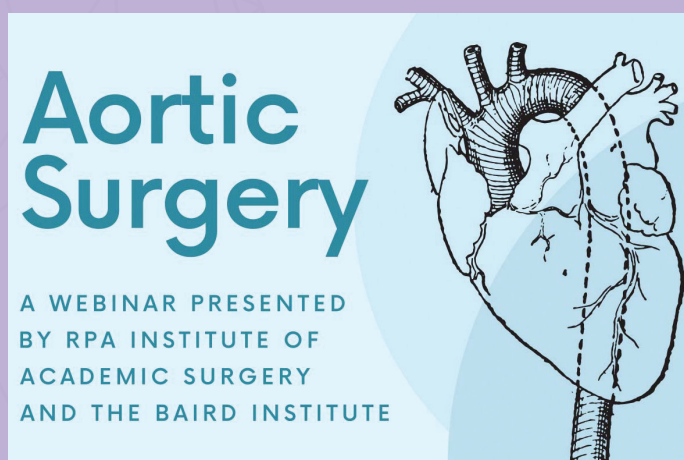
Dr. Brian Plunkett, Cardiothoracic Surgeon

The Cardiothoracic department continues to support the implementation and development of interesting and exciting education topics for the registrars and junior doctors in the team. Whilst COVID-19 certainly stymied many of our more involved teaching opportunities such as the face to face wet and dry labs in partnerships with the Institute of Academic Surgery (IAS) and the Charles Perkins Centre (CPC), the department was able to pivot and utilise other teaching components. These included telehealth and videoconferencing, as well as utilising smaller and specific skill-based simulation sessions such as the Robotics simulation sessions done in partnership with the Robotics Institute. Our robust didactic teaching sessions continue year-round, utilising alliances with key partners in critical care and cardiology.

We are looking to further cement these alliances and partnerships in 2022/2023, utilising them to ensure our teaching program remains exciting and innovative, hoping to resume more face-to-face opportunities and focus once again on the amazing technology and skills for teaching that is available to our team.

Cardiothoracic Surgical Education Webinars

In this past year we have held 2 webinars educating ICU, operating theatre and ward nurses, junior doctors and medical students on various forms of cardiothoracic surgery.



Aortic Surgery: 23 July 2021

Presenter: Professor Paul Bannon

This webinar was designed to give an insight into patients undergoing aortic surgery. There were three focus areas as follows:

Pre-operative Assessment: Including the classification of dissection, the types of aortic aneurysms, a case study of emergency vs elective (non-urgent/chronic) clinical presentation in ED/clinic.

Intra-operative: Including brief knowledge on surgical techniques, demonstration of grafts and valves for replacement and bypass

Post-operative: Including explanations for why chests are left open after procedure and postoperative complications (early signs and symptoms)

Advanced Robotic Surgery for Lung Cancer: 11 November 2021

Presenter: Associate Professor Christopher Cao.

This webinar was designed to give an insight into patients undergoing advanced robotic surgery for lung cancer. The featured topics were: Wedge Resection, Sleeve Resection, Segmentectomy and Lobectomy



Scholarships and Grants Program

An Interview with Dr Charis Tan

Cardiothoracic surgical registrar at Royal Prince Alfred Hospital, Master of Philosophy candidate at the University of Sydney and the recipient of a Baird Institute Scholarship

What is your research topic?

My Master of Philosophy research topic is titled: “Optimising Medical and Surgical Treatments of Tricuspid Regurgitation”. The Tricuspid valve is one of 4 heart valves that helps with blood flow. Tricuspid regurgitation (TR) unfortunately is a common disease/manifestation of the tricuspid valve, caused by various factors (Primary or Secondary) and affects 65-85% of the population.

What is the aim of your research?

The main aim of my research is to understand the impact of current management strategies for Tricuspid regurgitation. Therefore, the first study is to look at patients who have been referred late for TR surgery where

they’ve been suffering with right heart failure prior to surgery and understanding their outcomes vs those who have not had right heart failure before surgery. The second paper then investigates patients who have Tricuspid regurgitation due to atrial fibrillation (AF; a type of irregular heart rhythm) and outcomes after these patients have TR surgery as AF is the newest and currently under-studied cause of TR. Lastly a systematic review will be performed to understand the various outcomes of TVR for atrial fibrillation induced TR. Ultimately these studies will help us to optimise the timing of surgical treatment strategies for patients with Tricuspid regurgitation before it is too late.

What is the potential impact of your research?

Unfortunately, the Tricuspid valve has been the most neglected valve to treat until recently where TR has been recognized to be associated with deleterious outcomes. But even despite the acknowledgement of its significance, TR remains undertreated— where patients are rarely referred for surgery or often referred late for surgical intervention, and most end up never making it to surgery in time. Current European and American guidelines describe vague treatment strategies and therefore current medical and surgical strategies for Tricuspid regurgitation (TR) remain understandably controversial due to the limited data available.

Recent studies have also shown that isolated TR is independently associated with high mortality, recommending more attention to diagnosis, grading and optimum treatment strategy. However, these guidelines do not address the fact that these patients are usually at an extreme end of their tricuspid valve disease before being referred for surgery. There is a possibility that their longevity could be improved if surgery was offered earlier. Therefore, the grand plan for my research is to provide cardiologists and cardiothoracic surgeons a better understanding of the natural history of Tricuspid regurgitation and to recommend an optimum time for surgery... before they reach a stage where it’s too late and palliation ensues.

How has your scholarship from The Baird Institute helped you?

It has been a true honour to have had the support of The Baird Institute by means of a scholarship throughout my Master of Philosophy candidature. Not only have I managed to present at local and international conferences but also have managed to gain access to statistical software and undergo training courses to use them. Being around masters in this field by way of Professor Paul Bannon, has certainly opened doors to meet other experts in the field and broadened my vision for this project. Additionally, the scholarship has also allowed me to spread the word on this under-recognised area of cardiac surgery in hopes of raising more interest in research for future students and researchers at Uni presentations and conferences that I would not otherwise have had the opportunity to attend.

Once again, I cannot thank The Baird Institute enough for this huge opportunity to learn and develop as a budding researcher. I look forward to sharing the end results once it is completed.

REFLECTIONS

FROM A PAST PATIENT OF PROFESSOR DOUGLAS BAIRD AM

Enid Eyles



In Iran, April 2010

In December 1989 I arrived in Kathmandu, Nepal, with close friends to go trekking, having been there previously in the early 1980s. We were doing the Helambu Circuit Trek, a relatively low altitude trek with beautiful scenery. For me it was a night-marish experience. The descents were relatively easy but for every descent there seemed to be at least two ascents. They were extremely taxing, and I lagged seriously behind my companions. I was breathless and had to rest very frequently. On our return to Australia my friends told me they had fears of bringing me home in the proverbial green bag.

I returned to work but was hesitant to go bushwalking. Eventually one of our fellow bushwalking group, suggested I might have a heart problem. This thought was strengthened when my blood pressure couldn't be taken because of a very erratic heartbeat. In 1993 I was referred to a cardiologist, who ascertained that I had rheumatic heart disease.

Nearing the end of 1993, I had to rest several times between the station and my workplace and a decision was made for me to have a mitral valve replacement. In early December of that year, I was admitted to Strathfield Private Hospital and Professor Douglas Baird replaced my mitral valve with a mechanical valve and repaired my aortic valve, which had also been damaged.

After convalescing with family in Orange I returned to Sydney for my post-operative visit to Professor Baird. He pointed out to me that at that time, we were the same age and that there could be no more trekking in Nepal or for that matter, trips to countries that were considered third world. I should look to New Zealand if I wanted to go adventuring. It was my final visit to Prof. Baird and I felt dispirited but comforted by his humanity and his almost fatherly approach to telling me I had to look to gentler, safer pursuits.

My life went on as normal and in 1995 I learnt that Professor Baird had very sadly died, well before his time and at the peak of a brilliant career. I could not believe that the man who had given me a new lease on life had lost his own through one of the scourges of our time - cancer.

In 1996 I attained the statutory age of retirement for women - 55 - and retired. Because of my yen to travel in exotic places, in 1997 I started on two decades of travel to many places which are now destroyed or too unsafe to visit. I have visited Uzbekistan, Iran, Jordan, Mongolia, Morocco, Oman, Syria, East and West Turkey and Yemen. I have found people everywhere to be kind, helpful, interested and hospitable.

In 2017 I went on my last visit to Iran. During this trip I realised that my aortic valve was slowly becoming more diseased. My travels were going to come to a halt, just before everyone was grounded by COVID.



In Turkey in 2011

RESEARCH UPDATE

Clinical Trials

The cardiovascular research team at Royal Prince Alfred hospital consists of Lisa Turner, Carmel Oostveen, Lorna Beattie and we welcome our new recruit, Dhairya Vayada. Dhairya has extensive knowledge in implementing data science principles to a clinical research setting.

2021 has continued to be a challenge for the Research Department, working within pandemic conditions. However, despite the difficulties, research has continued and we find ourselves managing many interesting projects. One of our projects, Vision, is completed. This has been a lengthy process involving the recruitment and data collection of 500 patients. The purpose of this project was to provide useful information to help predict who may be at risk of having complications following heart surgery. This information will be an invaluable source as the total worldwide recruitment was 15,000.

The tissue bank projects have continued to run throughout this year and we are excited about the addition of patients from Strathfield Private Hospital for participation in these study projects. Heart failure represents a leading cause of morbidity and mortality both in Australia and Internationally. Heart failure is the final common clinical pathway for a number of pathological processes including atherosclerotic disease, cardiomyopathies, valvular disease, myocarditis and infection. The tissue bank provides an invaluable source for research projects to expand our current understanding of heart failure pathophysiology.

The Aortic Research Group

Dr Cassandra Malecki, BMedSc(Hons), PhD
Prof. Richmond Jeremy, FRACP; FCSANZ, FACC;
FESC; FAHA; GAICD

The Aortic Research Group, led by Professor Richmond Jeremy, undertakes both clinical and laboratory research into genetic causes of thoracic aortic aneurysms. Approximately 50,000 Australians, of all ages, have a genetic aneurysm, which are typically asymptomatic until the potentially fatal event of aortic dissection. Detection of affected individuals, understanding of clinical features and discovery of the cell mechanisms of aneurysm formation are key challenges.



The Aortic Group collaborates with the international Montalcino Aortic Consortium to discover new genes causing aneurysm, describe the clinical risk features and monitor the outcomes after surgical repair. The group also conducts novel laboratory research, underpinned by aortic tissue donated by patients undergoing surgery at RPAH for aortic aneurysms. This material is part of the comprehensive tissue collection of the Sydney Heart Bank. Currently, tissue from over 200 patients has been collected and cryopreserved, including patients with Marfan Syndrome (MFS), bicuspid aortic valve, Loey's-Dietz syndrome, familial TAAD and atherosclerosis. Additionally, blood samples from affected patients are included. The Bank is continuing to grow in scope and is key resource for new research studies.

One current research focus is a study of how changes in regulators of reading of the DNA code affect severity of aortic disease. We have found that alteration of DNA coding inflammatory genes correlates with the severity of cardiovascular disorders in Marfan syndrome, and this work is being expanded to other genetic aortopathies. Other discoveries include altered expression of miRNA molecules. In human vascular smooth muscle cells, changes to the levels of these miRNAs have an effect on pathways essential to vascular smooth muscle cell function and therefore may be contributing to aneurysm formation.

Currently, large-scale analysis of aortic aneurysm tissue samples is underway to investigate over 4500 proteins and genome-wide RNA expression. These studies will shed light on the mechanisms of aneurysm formation, potentially identify markers of progression of aortic disease and also identify new targets for effective treatment intervention.

The Aortic Group also plays an important role in training the next generation of clinicians and researchers, with 3 PhD and 2 MPhil graduate research students and undergraduate medical students included in the program.

Vascular Surgical Expansion Of The Biobanking Program at The Sydney Heart Bank

Dr Jacky Loa

Vascular Surgeon RPA and IAS Vascular Research Lead

The Sydney Heart Bank is a well-established biobank that procures aortic and valvular tissues. It is a joint collaboration between The Baird Institute, Royal Prince Alfred Hospital and the University of Sydney. With the expansion of the biobank to include vascular surgical tissues, the Sydney Heart Bank is one of only a handful of biobanks established in the world that would include arterial tissues from the head down to the feet. This would provide a comprehensive understanding of disease processes starting from the heart and their similarities throughout the whole body.

A major area of interest with this new expansion would include the carotid artery. The carotid artery is the main blood vessel to the brain and can develop atherosclerosis (build-up of plaque in the arteries). If the carotid artery becomes narrowed, this may eject plaque into the brain and cause a stroke. Research into the carotid artery aims to understand if there are similarities between the atherosclerotic process that occurs in the heart and the brain. The hope is this research would lead to the prevention of strokes.

Another area of interest with the new expansion would include research into the femoral artery. The femoral artery is the main blood supply to the leg and atherosclerosis and narrowing of this artery lead to decreased blood supply to the leg and ultimately amputations. Research into this area would also look for similarities of the atherosclerotic process within this region and the rest of the body. The aim is to find therapeutic targets in this area and prevent amputations in the future.

The vascular surgical unit at the Royal Prince Alfred Hospital is excited to contribute to the Sydney Heart Bank and help facilitate world leading research.

Gastrointestinal Complications Following Cardiac Surgery - A Retrospective Analysis Of Medical Records - A Cohort Study Of 7900 Patients

Dr Phillipa Smith

Co-investigators: Dr Nicholas McNamara, Dr John Brookes, Dr Benjamin Robinson, Prof Michael Solomon, Prof Paul Bannon

This research was presented by Dr. Smith at the General Surgeon's Australia Annual Scientific Meeting on Friday 8 October 2021. Gastrointestinal (GI) complications following cardiac surgery are known to lead to significant morbidity and mortality. The objective of Dr Smith's research project was to examine the incidence of these complications and to identify the associated risk factors from patient data in the RPAH cardiothoracic surgery database. The identification of risk factors will allow for the development of a predictive model and early management algorithm.

Purpose/Introduction:

Gastrointestinal (GI) complications following cardiac surgery have been associated with significant morbidity and mortality. The pathogenesis of GI complications in this cohort is thought to revolve around splanchnic hypoperfusion, whereby the circulatory shifts during cardiac surgery greatly affect blood supply to splanchnic organs. These complications are difficult to diagnose for a number of reasons, including the use of sedation, vasopressors and analgesia, which mask symptoms and signs. This study sought to investigate the prevalence and risk factors for the development of GI complications post cardiac surgery.

Methodology:

A retrospective study was performed examining the prevalence and characteristics of patients who had GI complications following cardiac surgery at our institution over a 14-year period.

Results:

7986 patients were included in the analysis. 190 patients (2.4%) developed GI complications following cardiac surgery, and 32 (16.8%) of these patients died within 30 days of operation. Patients with these complications were 6.8 times more likely to die than those without. (95%CI 4.52-10.11, $p < 0.0001$). The most common GI complication was GI bleeding (59), while intestinal ischaemia was most commonly associated with mortality (24). Eighty patients required surgical or radiological intervention, including laparotomy (36) or endoscopy (37). The risk factors for development of GI complications included age, smoking status, perioperative use of inotropes, cardiopulmonary bypass time, and reoperation.

Conclusion/s:

GI complications following cardiac surgery are uncommon; however, they are associated with high mortality and morbidity. The identification of patients at risk of these complications may provide a useful tool to reduce morbidity and mortality in this patient cohort.



The Royal Prince Alfred Hospital Aortic Team

**Professor Tristan Yan BSc(Med)
MBBS MS MD PhD FRACS**

Cardiothoracic Surgeon

It is fair to say that a Thoracic Aortic Aneurysm is a Great Masquerader. It can destroy any vessel to any organ in the body, with a single stroke. Of course, it can cause aortic rupture and death. This is the reason an 'aneurysm' has historically been perceived as the 'old demon' in the surgical literature.

The Royal Prince Alfred Hospital (RPAH) is a major referral hospital and is recognised for its excellence and innovation in aortic services.

The **RPA aortic surgery program** was initially set up by Professor Cliff Hughes, who was one of the first surgeons to do the Bentalls' procedure in Australia. The aortic program has since been strengthened and expanded

under the leadership of Professor Paul Bannon, who is recognized internationally for his surgical expertise in aortic and complex root reconstructive surgery.

Vascular surgeons, Professor Jim May and Dr Jeff White were excellent surgeons and trainers of generations of surgeons in this country, who provided outstanding service at RPAH. They were responsible for the introduction of endovascular surgery in Australia, and both had outstanding international profiles in this discipline.

There has been a tremendous evolution in both cardiac surgery and vascular surgery over the years. There is a greater appreciation now, that when we are talking about treating any complex diseases, we need to get away from defining ourselves by the specialties that we are in, and really direct our focus towards how to treat the patient in the best possible way and to achieve the best patient outcomes.

There has been a trend to subspecialize within both disciplines to focus on "aortic interventions" and the task has fallen on the "Aortic Team" to explore both surgical and endovascular options for our patients in a collegiate multi-disciplinary team (MDT) environment. It really requires this MDT to review these complex cases together. At the MDT meetings, different pathologies such as thoracic or abdominal aortic aneurysms, aortic dissection, aortopathy and graft infection are discussed and various treatment options such as open, hybrid, endovascular and medical therapy are recommended.

With the introduction of endovascular aneurysm repair, using stent grafts has resulted in a major paradigm shift in the field of aortic surgery. It's true that the technical details and risk profiles vary greatly between the two, but the principles remain the same. A successful aneurysm repair depends on either open replacement or endovascular exclusion, with healthy segments of artery proximal and distal to the repair. In addition, aortic arch and visceral segments and chronic

dissections, add layers of technical complexity to aneurysm treatment.

Even though endovascular repair has become the principal way of dealing with most aortic aneurysms, open repair remains an essential treatment in many circumstances. We consider open surgical treatment to be beneficial for those young patients who have good performance status for better long-term outcomes and for treating patients whose aortic disease has genetic causes. Finally, for those patients for whom previous attempts at endovascular repair have failed, surgical approaches to device removal and definitive repair are becoming increasingly necessary.

I had the privilege of learning under the guidance of Professor Aung Oo as his aortic fellow. He is a world-renowned aortic surgeon, particularly known for open thoracoabdominal aortic repair. Prof Oo was originally the head of aortic surgery at the Liverpool Heart and Chest Hospital but he moved to St Bart's, London to set up a second aortic centre in the UK. One of the most important lessons that I have learned from him is that you can certainly succeed with good colleagues and limited resources, but you cannot succeed with poor colleagues and great resources. You never hear him raise his voice and everyone listens to him attentively when he speaks. He recognises the importance of unified teamwork and that the key is to have a shared vision.

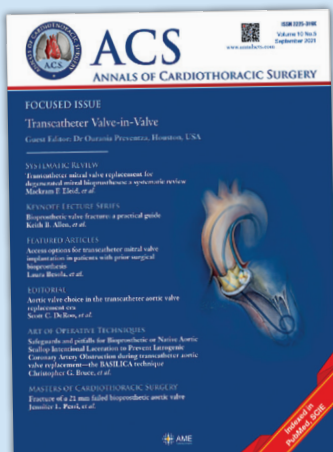


Indeed, a big part of this, is to build a team with a purpose and a shared vision. For us, this shared vision is to establish a thoraco-abdominal aortic (TAAA) program at RPA.

With that in mind, Dr Raffi Qasabian, Dr Stephen Llewellyn, our senior cardiac anesthetist, and I went to Barts Heart Centre, based at St Bartholomew's Hospital in the City of London, to see how their aortic service operates and functions. Over the subsequent two years, we also invited Professor Oo to Sydney to guide our RPA Aortic team, as it was very clear to us that the success of a TAAA program is very much dependent on the overall growth of the team.

We have now formed a strong RPA aortic team. The team consists of 2 cardiac surgeons and 3 vascular surgeons, specializing in aortic surgery; 5 cardiac anesthetists/perfusionists, 2 neuromonitoring anesthesiologists, and 2 cardiologists, specializing in aortopathy and connective tissue disorders. We have monthly aortic MDTs and Marfan clinics. All aortic tissues are stored in the heart bank and we have the largest aortic database with more than 20-year follow up.

Together, not only do we need to train surgeons to master the craft of aortic surgery, but perhaps more importantly, we need to take one step further and train the future generation of surgeons on how to work together throughout their career.



Publications

ACS – Annals of Cardiothoracic Surgery

The Annals of Cardiothoracic Surgery (ACS) is delighted to announce that its continued strong growth has been reflected in a new higher **Impact Factor of 4.101** as released by Clarivate Analytics. This means that the journal is ranked first in Asia-Pacific and fourth in the world and is one of the leaders in the communication and advancement of academic research

The ACS is a bi-monthly, peer-reviewed publication dedicated to the field of cardiothoracic surgery. Highlights in recent ACS publications include: “Bioprosthetic Valve Fracture: a practical guide”; “The Ross procedure is the optimal solution for young adults with unreparable aortic valve disease”; “Direct transcatheter mitral valve implantation in severe mitral annular calcification: technique and evidence” and “A step-by-step guide to trans-axillary TAVR”.

For the latest issue and articles, visit <http://www.annalscts.com/>

Other Research Publications

For a full list of The Baird Institute's research publications, please go to our website at: www.bairdinstitute.org.au/our-publications/



OUR SUPPORTERS

Since its inception, The Baird Institute has been privately funded by bequests left by former patients of the surgeons who are associated with the Institute, corporate funding from our partners and donations received from our supportive group of donors who provide both donations to continue our research and their time in organising fundraising events for The Baird Institute. We greatly appreciate their unwavering support.

Partners In Research

We are very lucky to have a group of committed supporters who provide donations to The Baird Institute on a regular and continuing basis. Our **Partners in Research** support us because we deliver long term life-changing solutions that can save lives and make such a difference to people living with chronic disease. The steady stream of funding from our **Partners in Research** provides some certainty for The Institute in a competitive and unpredictable funding environment and allows us to plan for the future with confidence.

Corporate Supporters

Special thanks go to our corporate partners - Medtronic, Baxter and Edwards who are providing assistance in the form of educational grants for research scholarships and grants to trainee cardiothoracic surgeons.



Edwards

Medtronic **Baxter**

Philanthropic Supporters

Lin Huddleston Charitable Foundation
Pro Choice Safety Gear – The Bird family



FINANCIAL SUMMARY

Profit & Loss Statement

Revenues

Research and Training	\$ 239,112	\$ 258,578
Donations and Fundraising	\$ 305,461	\$ 292,752
Miscellaneous	\$ 1,033	\$ -
Interest and Investment Income	\$ - 62,815	\$ 53,242

TOTAL	\$ 482,791	\$ 604,572
--------------	-------------------	-------------------

Expenses

Employee benefits	\$ 251,499	\$ 213,830
Research consumables/equipment	\$ 57,722	\$ 79,451
Office expenses	\$ 28,023	\$ 22,560
Depreciation	\$ -	\$ -
Fundraising/Marketing	\$ 55,110	\$ 39,766
Miscellaneous	\$ 1,639	\$ 347

TOTAL	\$ 393,993	\$ 355,954
--------------	-------------------	-------------------

Surplus/Deficit for the period	\$ 88,798	\$ 248,618
---------------------------------------	------------------	-------------------

Balance Sheet

Assets

Cash and cash equivalents	\$1,445,311	\$1,314,971
Trade and other receivables	\$ 20,706	\$ 14,240
Other current assets	\$ 6,932	\$ 2,635

TOTAL	\$1,472,949	\$1,331,846
--------------	--------------------	--------------------

Liabilities

Trade and other payables	\$ 22,816	\$ 23,715
Employee entitlements	\$ 33,956	\$ 15,394
Other liabilities	\$ 6,750	\$ 5,600

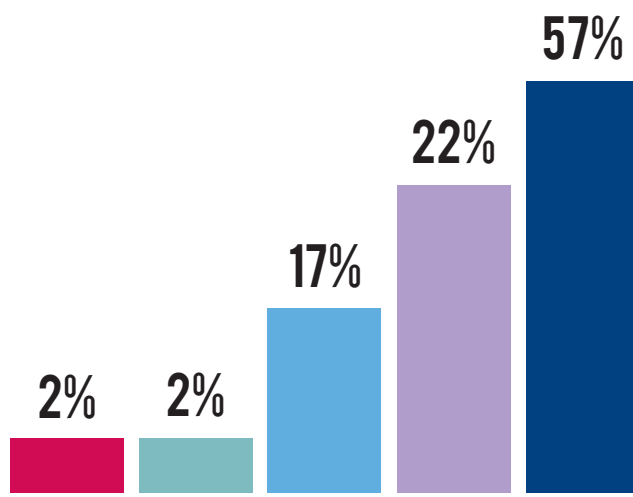
TOTAL	\$ 63,522	\$ 44,709
--------------	------------------	------------------

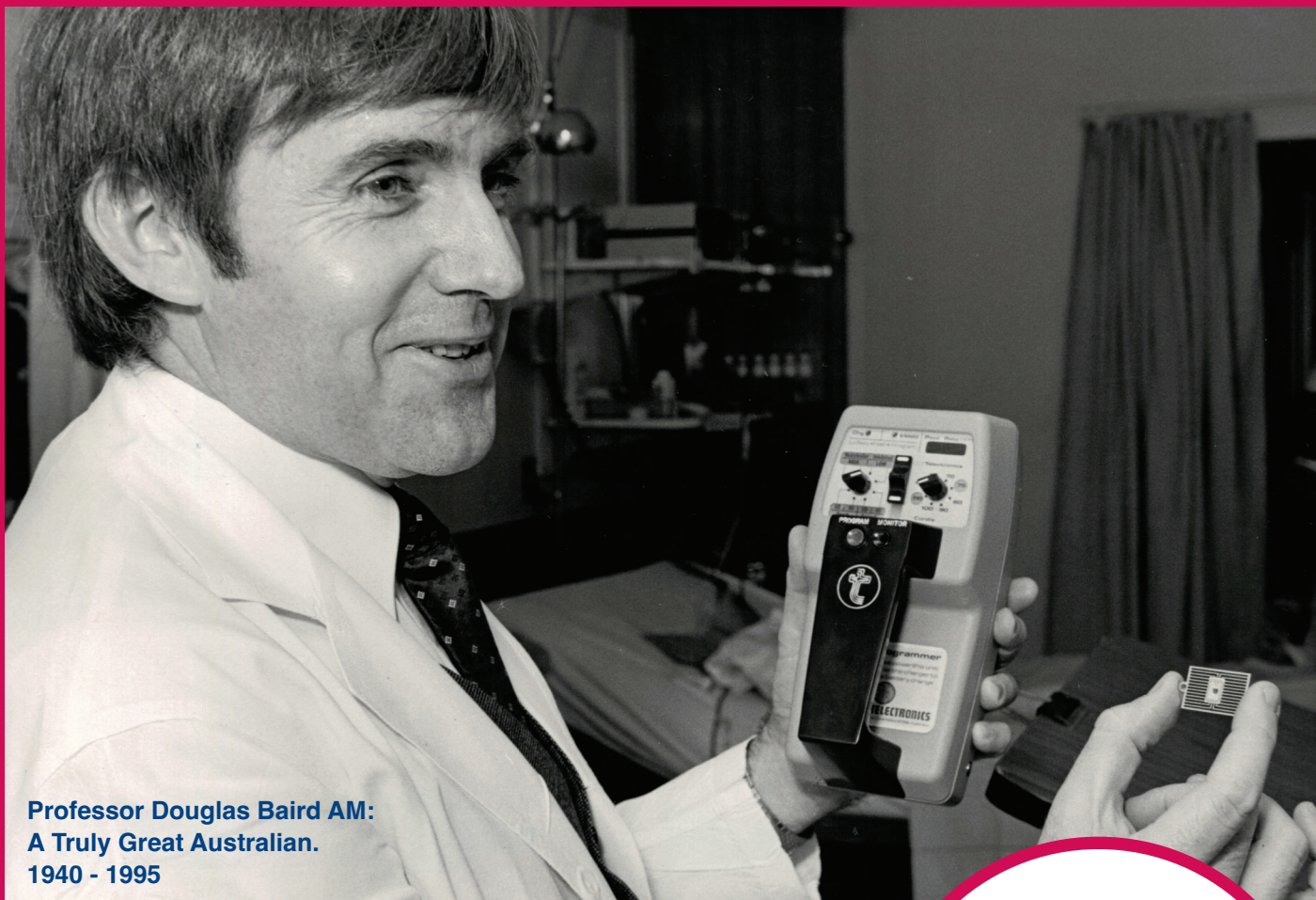
Net Assets	\$1,409,427	\$1,287,137
-------------------	--------------------	--------------------

ORIGIN OF DONATIONS

2020-2021

- Community fundraising
- Bequests & memorials
- Industry partners
- Philanthropy
- Appeals, recurring & general donations





Professor Douglas Baird AM:
A Truly Great Australian.
1940 - 1995

For a full list of all research publications of
The Baird Institute, please go to our website
<https://bairdinstitute.org.au/research/our-publications/>

WE NEED YOUR HELP

Please visit the
following webpage
to see how you can
help our cause

<https://bairdinstitute.org.au/you-can-help/>



 www.bairdinstitute.org.au

 **PO Box M85, Missenden Rd,
NSW, 2050**

 **02 9550 2350**

 **info@bairdinstitute.org.au**

 **facebook.com/ bairdinstitute/**

ABN 38 096 746 806

