ANNUAL REPORT FINANCIAL YEAR 2024

THE BAIRD INSTITUTE

Applied heart & lung surgical research

CONTENTS

CHAIR'S MESSAGE

Professor Paul Bannon
MB BS, FRACS, PhD

I am delighted to present to you the Annual Report for the financial year 2023/2024. It is truly remarkable to reflect on the progress we have made with your help. Within these pages, we highlight some of the extraordinary developments that your continued support has made possible.

A key achievement this past year has been Dr. Robert Hume's receipt of the prestigious Vanguard research grant. Dr. Hume, based in our *Centre for Heart Failure & Diseases of the Aorta*, is collaborating with world-renowned biomaterials engineer, Professor Tony Weiss, to develop and test revolutionary blood vessel replacements. This work is particularly significant in light of the sobering statistic shared by the American Heart Association in 2020, which reported 150,000 global deaths from aortic aneurysms, a 26% increase since 2010. Dr. Hume's research, alongside other cutting-edge initiatives at The Baird Institute, is helping to address these critical health challenges and push the boundaries of medical science

We are excited to share that Professors Lal, O'Sullivan and myself are leading the world's first clinical trial focused on the cardiac energy system. This ground breaking research aims to find new ways to enable failing hearts to generate the energy needed for survival, offering new hope to thousands affected by heart failure. The team are tackling "stiff heart failure"—a condition for which current therapies are insufficient. Our research into replenishing NAD is showing promise and is currently being tested in the CardioNAD clinical trial, which we hope will offer new treatments for patients.

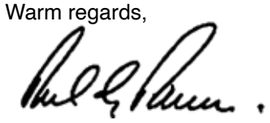
Inside, we are privileged to share the heartfelt stories of two kind individuals. One is from John Collins, whose generosity has led to a $20,000 contribution to The Baird Institute. John opens up about the motivations behind his profound act of kindness. His unwavering commitment to advancing heart research and his enduring belief in our mission remind us of the importance of our work and the lives we strive to improve. The second story is from Penny Willis, a generous supporter of ours who courageously recounts her late husband Barry's journey with heart disease. While deeply emotional, Penny's willingness to share her story serves as a powerful reminder of the impact that the work we do has on families.

Your generosity is also helping to shape the next generation of researchers. We are excited to introduce Mr. Matthew Taper, a recipient of a Baird Institute Scholarship, whose research focuses on understanding the factors involved in heart aging and heart failure. His work exemplifies the transformative impact of your support on future scientific innovation.

Moreover, we spotlight the invaluable contributions of Clinical Nurse Consultants, Lisa Turner and Lorna Beattie who manage our clinical trials with dedication and expertise. Their collaborative efforts ensure the success of our research endeavours, facilitating vital collaborations and advancing patient care.

On behalf of everyone at The Baird Institute, I extend our deepest thanks for your unwavering commitment to advancing heart and lung health. Together, we are making a real difference, and we are deeply grateful for your steadfast support which is instrumental in driving our progress. Your unwavering support continues to drive our mission forward, and we are grateful for the opportunity to share with you the progress made possible by your generosity.

Warm regards,



Professor Paul Bannon

PATRON'S MESSAGE

The Hon Michael Kirby AC CMG

We are living through challenging times. In earlier generations, Australians learned of distant conflicts through letters or newspapers, with news often taking weeks or months to reach our shores. Today, with the immediacy of satellite transmissions, film, and daily news updates, it's almost impossible to avoid the overwhelming images of suffering from global crises like Ukraine, Israel/Gaza, and North Korea. While we may feel powerless to stop these tragedies, the pain of knowing that innocent lives are being lost is deeply unsettling.

At The Baird Institute, we too face the heartbreaking reality of patient tragedies and family losses. Sometimes, urgent interventions come too late, or treatments fail to overcome profound conditions. Yet, we continue to honour the doctors, nurses, and staff who work tirelessly on the frontlines of healthcare, especially in life-saving fields like cardiothoracic surgery. Their dedication and compassion, often drawn from personal experience or family hardships, deserve our deepest gratitude.

I first met Doug Baird as an undergraduate at the University of Sydney. He was a brilliant young medical student, later becoming a pioneering heart surgeon who performed an early bypass procedure on my mother. His legacy lives on in The Baird Institute, a place that attracts some of the brightest minds from around the world, continually advancing surgical techniques and medical care. Amid the bleakness of global events, the work of The Baird Institute is a beacon of hope, inspiring us all.

This year's Annual Report features stories of people whose lives have been saved thanks to the skill and care of The Baird Institute's surgeons. While some recover for many years, others may only have a brief reprieve, but the gift of life-saving care is always precious.

I am particularly proud of the groundbreaking research being conducted here. Dr. Robert Hume's work on heart regeneration and Dr. Martin Misfeld's advancements in aortic surgery are pushing the boundaries of what's possible in modern medicine. While science and technology are sometimes used for destruction in other parts of the world, here at The Baird Institute, they are wielded to save lives and improve outcomes for heart and lung patients.

When we think of The Baird Institute and the inspiring work of Prof. Paul Bannon and his team, it gives us reason for optimism, even in the face of current global challenges. The spirit of humanity is unconquerable, and we must support The Baird Institute to ensure its continued success. Together, we can turn this good news story into a lasting legacy.

As patron, I am privileged to witness firsthand the remarkable impact of your generosity. Your unwavering support drives transformative change in cardiothoracic research, offering hope to countless individuals. The Institute's pioneering efforts are making real strides in improving patient outcomes.

Thank you for your continued dedication to The Baird Institute. Your collective efforts are making a profound difference, and I am honoured to be part of this incredible journey with you.

The Hon Michael Kirby AC CMG

CEO'S MESSAGE

Ms Catherine Rush

We are thrilled to share with you our Annual Report for financial year 2024 and I want to extend our heartfelt gratitude for your continued support of our mission. Over the past year, our dedicated team has made significant strides in advancing the understanding of heart and lung health, and we are excited to offer you an update on the progress we've made together.

As we reflect on the 2024 financial year, we are pleased to report that The Baird Institute has once again demonstrated financial resilience. Your steadfast commitment has been crucial in sustaining our mission to drive forward world-class research that improves the lives of those affected by heart and lung diseases.

For the **2024 financial year**, The Baird Institute achieved a **total revenue of $953,322**, maintaining a stable position relative to the previous year. This figure reflects the diverse funding sources that support our work, including research grants, philanthropic donations, bequests, strategic partnerships, and investment income. Each of these contributions is essential in enabling us to continue our ambitious research agenda.

We are proud of the way in which we have managed these resources, with a strong focus on financial responsibility and transparency. In the past year, **54%** of our total expenditure was allocated directly to research and training initiatives, which include cutting-edge projects, clinical trials, fellowships, scholarships and the development and continuation of translational research programs. This focus on research investment will continue to grow in the coming years, as we increase our commitment to pushing the boundaries of scientific discovery and improving patient outcomes.

Our operating surplus for **financial year 2024** rose by **14%** compared to the previous year. This reflects the Institute's strong financial stewardship and the effectiveness of our fundraising efforts. Additionally, our net assets have grown by **28%**, reaching **$2,341,382** as of June 30, 2024, up from **$1,831,608** in the previous year. This growth not only strengthens our financial position but also positions us for future success in driving forward life-saving research and expanding our impact.

For those interested in a more detailed breakdown of our financial position, we encourage you to refer to the full financial statements included at the end of this report.

Looking to the future, we are committed to ensuring the continued financial sustainability of The Baird Institute. We will explore diverse funding opportunities, build on existing partnerships, and maintain our rigorous fiscal discipline to support our long-term goals. These efforts are critical to ensuring that we remain at the forefront of scientific discovery and that our work has a lasting, positive impact on heart and lung health.

Once again, we extend our deepest thanks to you for your unwavering support. Your generosity plays a central role in the continued success of our mission, enabling us to fund transformative research, support our brilliant team of researchers, and continue to make meaningful progress in the fight against heart and lung diseases. Together, we are making a significant difference.

Ms Catherine Rush

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.

PROFESSOR DOUGLAS BAIRD AM

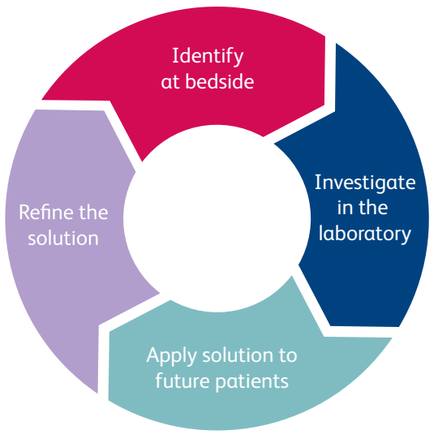
20 JUNE 1940 – 16 NOVEMBER 1995

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”.

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.



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 post-surgery 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
- To Provide Ongoing Training and Development

OUR BOARD OF DIRECTORS

- **Professor Paul Bannon**, MBBS PhD FRACS, Chair
- **Mr Shaun Clyne**, MA LLM (Syd), Non-Executive Director
- **Professor Richmond Jeremy**, MB BS PhD, FRACP, FAHA, FESC, FCSANZ, GAICD, Non-Executive Director
- **Ms Joanne Wade**, BEc, LLB, Non-Executive Director
- **Associate Professor Sean Lal** BMedSci (Hons), MBBS(Hons), MPhil(Med), PhD(Med), FRACP, Non-Executive Director
- **Mr Ross Saunders**, Non-Executive Director
- **Ms Jivani Murugan**, BSocSc, Non-Executive Director

OUR STAFF

- **Ms Catherine Rush** - CEO
- **Ms Lorna Beattie** – Clinical Trials Manager
- **Ms Sue Moore** – Administration & Events Manager
- **Ms Tatum Faber** – Donor Relations Officer
- **Mr Dhairya Vayada** – Data Research Assistant
- **Dr. Cassandra Malecki** – Postdoctoral Researcher & Biobank Manager
- **Dr. Robert Hume** - Postdoctoral Researcher & Lead of Translational Research
- **Ms Erin McMullen**, Company Secretary.

SCHOLARSHIPS & GRANTS

MR. MATTHEW TAPER

I grew up just outside of Sydney in the Blue Mountains and completed my Bachelor of Science at the University of Sydney, majoring in physiology. My honours year was focused on diabetes, where I spent time investigating the factors involved in the release of insulin. Following my honours year and a subsequent short research scholarship, I worked in a pathology lab for just over a year. Although I enjoyed my time there, I found myself missing science. Fortunately, I had an encounter with Associate Professor Sean Lal, who generously offered me the chance to pursue a master's degree under his guidance and supervision.

I am in the process of converting from a master's degree to a PhD and have been extremely fortunate to receive a Baird Institute Scholarship for 2024 and 2025. This amazing opportunity will allow me to conduct important research into the potential key drivers that cause our hearts to age, as well as the relationship between aging and heart failure. Specifically, I will be focusing on a group of factors that might be causing the aged heart to not relax properly, thus impairing its ability to fill with blood. I will also be investigating whether these same factors may promote cardiac regeneration following a heart attack.

COMMUNITY FUNDRAISING

City 2 Surf – 13 August 2023

Natalie Zugec and her band of family and friends were back at the City 2 Surf this year once again on the 10th anniversary of James' passing. At this event each year, Natalie and her team always manage to raise in excess of $2,000 for The Baird Institute in memory of her husband, James Wadland who died of an aortic dissection at the age of 35.

PATIENT STORIES

THE COLLINS FAMILY DONATES $20,000 TO THE BAIRD INSTITUTE

John Collins, heart surgery patient and major supporter of The Baird Institute

In May 2003 I suffered a heart attack that took everyone by surprise.

I was 52 years old and had never had a sign. I was fit, having run the previous 15 'City to Surfs' with times around 60 minutes. I ate healthily, have never smoked and there was no history in the family - although there is now!

On that eventful evening my family were arriving for a dinner party, Christine and I were leaving for America the following week. They were all very traumatised to see the paramedics stretchering me out the door wearing an oxygen mask.

Such was the impact, my 3-year-old grandson would not sleep for several days until his Mum brought him up to the hospital to see that Pop was okay.

9 days later, I was deemed stable enough for the triple bypass operation performed by our very own Chair of The Baird Institute, Prof. Paul Bannon. After the operation, he advised Christine that "the operation went very well". She says those reassuring words got her though the forthcoming weeks. Subsequent angiograms have shown very little change to the grafted arteries, confirming that success.

On the 20-year anniversary of my bypass surgery in May 2023, the family were determined to make a contribution to The Baird Institute. On each anniversary we make a donation but they wanted to celebrate this milestone - dad/pop still here for another 20 years!

Our family visited The Baird Institute's headquarters at the RPA hospital at the invitation of Catherine Rush and Paul Bannon. We saw firsthand the work they, and their staff put into heart and lung research and their determination to improve medical procedures and processes.

The knowledge and the absolute dedication of Paul and his team was something we will never forget; my 2 grandchildren were left just so inspired. This family is so grateful for all this good work and will continue to support The Baird Institute including provision in our wills.

We are proud and humbled to have been given the opportunity to make a small contribution to such an important and worthwhile institution.

There can be no greater satisfaction in this world than saving lives and sending the patients home to their loved ones.

Barry's Story

PENNY WILLIS

Barry Willis was my dearly loved and loving husband, and a wonderful father, grandfather and loyal friend who worked as a research and development chemist, displaying the most amazing engineering and handyman skills. He was a tall, slim, active, fit, healthy living, caring, considerate, kind, patient, thoughtful and witty man, who greatly enjoyed life and all that it had to offer. He suffered from migraines for over thirty years for which he took preventative medication, and in 2007 was diagnosed with peripheral neuropathy, with no cause determined after exhaustive testing. Following a CT scan in 2012, Barry had been told that he had a "tortuous" aorta, but there was no indication that this was a concern.

It was therefore a great shock when on 30th March 2015, Barry, then aged 65 years, complained of sudden, ripping chest pain and dizziness and was taken to Concord General Repatriation Hospital. A heart attack was ruled out within hours. A member of the medical team "inexplicably cancelled" a CT scan planned for Tuesday 31st, leaving Barry to continue suffering relentless pain for close to 75 hours, until he finally underwent two CT scans five hours apart on Thursday 2nd April which diagnosed his condition as being not only a B dissection in his descending aorta, but also an Acute Type A aortic dissection. He was then rushed to Royal Prince Alfred Hospital (RPAH) for emergency surgery where he was met by one of the specialist Baird Institute surgeons who informed him that he would die unless he underwent surgery.

The following morning, Good Friday, 3rd April, following the operation which involved heart valve replacement and dacron grafting of Barry's ascending aorta, the surgical team met with me and our children and informed us that in addition to Barry's operation being a very long and difficult one, they believed that he had a genetic connective tissue disorder, Familial Thoracic Aortic Aneurysm and Dissection (Familial TAAD). It was recommended that Barry's siblings and all children have their aortas checked. Both of Barry's brothers were subsequently found to have aneurysms measuring up to 5 cms in their ascending aortas and their health continues to be monitored. The surgeons further explained it was "touch and go" as to whether Barry would survive and the next 24 hours would be crucial. Barry's operation was complicated by bleeding and the surgeons had opted to delay chest closure until the bleeding was controlled. Over the next two days, Barry was in an induced coma, while our family waited to see if he would survive. The bleeding slowed during this period, and on Sunday 5th April, Barry was returned to theatre for the chest closure procedure. After the surgery, Barry gradually regained consciousness and commenced his long road to recovery. After leaving RPAH in mid-April, he spent nine days in Royal Rehabilitation Hospital at Ryde before finally coming home 27 days after his dissection. We called him "Miracle Man". He felt so lucky to be alive and he considered every day to be a gift. He very persistently and determinedly worked hard to regain his health and strength.

Over the next two years, Barry was closely monitored by his surgeons and his cardiologist, Professor Richmond Jeremy. Regular CT scans to monitor aortic dilation were always a major source of anxiety since we had been told that it was very likely that Barry would require further repair surgery in the future, as the surgeons had done the best they could in the aortic repair surgery under very difficult circumstances, especially in view of the four day delay in diagnosis. Barry also had a number of other health issues, necessitating regular visits to the GP and other specialists.

As Barry's wife and carer, I took over the lawn mowing, gardening and lifting tasks, and did all I that I could to look after him in order to keep him alive. For the first year after his dissection, I continually felt we were living with a ticking time bomb. It was always in the back of our minds, which made it hard to relax and enjoy life.

We gradually resumed our former activities and interests, with Barry back researching and doing his much-loved handyman tasks, and me teaching and volunteering in the community. We also resumed our weekly 25 km bike rides and we walked daily. We enjoyed some short holidays and day outings, although long distance and overseas travel was now totally out of the question. We also had many opportunities to enjoy time with our children, grandchildren, extended family and friends, time together which we always treasured.

Unfortunately, a CT scan conducted in March 2017 revealed that Barry's aorta was measuring 6.0 cms in parts, and following consultation with Professor Jeremy and the Baird specialist surgeons, Barry was strongly advised to undergo further major repair surgery involving the replacement of his aortic arch and the insertion of a frozen elephant trunk prosthesis, as he was now at great risk of rupture and certain death.

Not looking forward to it but having researched in depth the procedure which we were informed had an 85 - 90% chance of success, Barry was admitted, ever hopeful, to RPAH on 8th August. On Wednesday 9th, he underwent a 12-hour long operation performed by the specialist Baird Institute surgical team, which he miraculously survived. Unfortunately, Barry had to be returned to theatre early the next morning for chest re-opening due to bleeding complications. He remained in an induced coma for another nine days due to problems controlling the bleeding, chest reclosure, clots and infections. In addition, we were told that he had suffered a small sub-arachnoid brain haemorrhage. On the 20th of August, following the tracheostomy operation, Barry regained consciousness and for the next 19 days, he courageously fought further complications and eventually weaned himself off the ventilator. It was a very traumatic, challenging and worrying time for us all.

Sadly, there were to be no more miracles.

On Friday evening 8th September 2017, Barry's 32nd day in Cardiac Intensive Care, shortly after I had said good night and told him that I loved him, he suffered a catastrophic subdural brain haemorrhage, thought to be caused by a clot in his venous sinuses pressing on his brain. Barry had completed an Advanced Health Care Plan, also indicating his wishes as a registered organ donor. Barry spent two days on a breathing machine, and following declaration of brain death, one of his kidneys was retrieved and later transplanted into a recipient who had been on dialysis for two years. It is a small comfort to our family to know that Barry lives on in someone else, as well as in our hearts and memories.

Following his dissection, Barry and I became donors to The Baird Institute, as we and our family were so grateful to Professor Jeremy and the specialist Baird Institute surgeons for their caring monitoring, skills and knowledge to prolong his life, which enabled me and our family to have Barry in our lives for another 29 months after hisdissection.

> "I miss Barry every day, and since his death, I have done my utmost to raise awareness in the community of the symptoms of aortic dissection and the importance of early diagnosis and intervention."

I miss Barry every day, and since his death, I have done my utmost to raise awareness in the community of the symptoms of aortic dissection and the importance of early diagnosis and intervention. In addition, I have continued to financially support The Baird Institute and its wonderful work in research, development and training (causes very close to Barry's heart - pardon the pun) as a Partner in Research, making donations to their appeals and i ncluding provision of a bequest to the Institute in my will.

I feel immensely excited and hopeful about the current research being undertaken by The Baird Institute, as I consider it has the potential to save many more lives, thus allowing families more precious time with their loved ones.

RESEARCH UPDATE

CENTRE FOR HEART FAILURE AND DISEASES OF THE AORTA

Dr Robert Hume PhD
Lead of Translational Research
The Rob Bird Aortic Research Program

CENTRE FOR HEART FAILURE & DISEASES OF THE AORTA
SYDNEY

Since I started with the Baird Institute 1.5 years ago, my research accomplishments have grown exponentially. This is only possible through the continuous support of my supervisors and mentors within the Centre for Heart Failure and Diseases of the Aorta – Associate Professor Sean Lal, Professor Paul Bannon and Professor John O'Sullivan. Importantly, all these achievements are only possible with the support of the donors, which help fund our ground-breaking research here at the University of Sydney.

One major project we hope to publish this year, investigates the heart's natural ability to replace damaged tissue, known as cardiac regeneration. This heart tissue can die following a major event, such as a heart attack (aka myocardial infarction). Our new understanding of how the heart behaves in these circumstances could have major implications for how we treat heart failure.

We have recently begun research into our new degradable artery graft. This artery graft will be used to replace arteries that have been damaged through disease. As arteries are quite flexible, our replacement has been designed to be more elastic than currently available materials, which are too stiff. Additionally, after it has been surgically implanted, the replacement will slowly degrade and will encourage the artery to grow back together. It is through this process that the body will be able to heal itself, replacing damaged arteries, initially with our degradable replacement, followed by a new healthy blood vessel. This new artery graft could revolutionise how we treat artery disease, allowing patients to regrow their own damaged arteries.

I would like to thank all the wonderful supporters of The Baird Institute for helping us undertake such exciting and groundbreaking research.

The team at the Centre for Heart Failure and Diseases of the Aorta

Robert's 3-year fellowship has been generously funded by the Bird Family. Rob Bird died of an Aortic Dissection in 2010 and his family have made a commitment to funding aortic disease research at The Baird Institute. As a result, we have named the aortic research program after Rob Bird.

RESEARCH PROJECT - OUTCOMES OF CORONARY ARTERY BYPASS SURGERY IN ELDERLY PATIENTS

Dr. Nicholas McNamara,
Baird Institute Grant Recipient and Cardiothoracic Registrar

The Australian population is rapidly ageing, and the number of patients aged 80 years and older presenting for coronary artery bypass surgery (CABG) is expected to increase. Studies investigating the outcomes of CABG in elderly patients are generally from single centres (eg. a particular hospital) and limited by small numbers and a lack of long-term follow up.

Our study aims to overcome these limitations by utilising the Australian and New Zealand Society of Cardiac and Thoracic Surgeons (ANZSCTS) database to investigate the postoperative outcomes in this cohort of patients. The ANZSCTS database is a binational database that captures operative and postoperative data for all patients undergoing cardiac surgery in Australia and New Zealand.

The database currently collates data from 56 participating sites and will provide a large sample size to permit robust data analysis. This analysis of short and medium-term outcomes will be supplemented via linkage with the National Death Index to examine long-term survival. The overarching aim of this analysis is to explore the impact of cardiac surgery on octogenarians in both the short and long-term, and to identify risk factors that can assist with surgical risk stratification.

PRESENTATION AT THE INTERNATIONAL CONFERENCE ON ROBOTIC SURGERY

Dr. Abraham Rizkalla, Cardiothoracic Registrar.

In March this year, I had the pleasure of attending the International Conference on Robotic Surgery held in Sydney. Being supported by The Baird Institute and Royal Prince Alfred Hospital, I was able to present the latest advances in minimally invasive robotic cardiothoracic surgery, focussing on the techniques and nuances of robotic surgery.

I presented two cardiac and two thoracic surgical procedures completed by Professors Tristan Yan and Chris Cao at Royal Prince Alfred Hospital, who routinely take advantage of the faster recovery and reduced pain offered by robotic surgery. Each of the four cases were highly engaging, involving removal of a tumour from inside the heart, repairing a leaking heart valve, removing an early lung tumour, and a complex removal of a tumour within the airways without having to sacrifice any lung tissue.

The audience found the operative videos fascinating and acknowledged the excellence of the surgeons involved by awarding 'best presentation' for the removal of heart tumour. I am deeply grateful for the supporters of The Baird Institute for giving me the opportunity to present this research on one of the frontiers of cardiothoracic surgery.

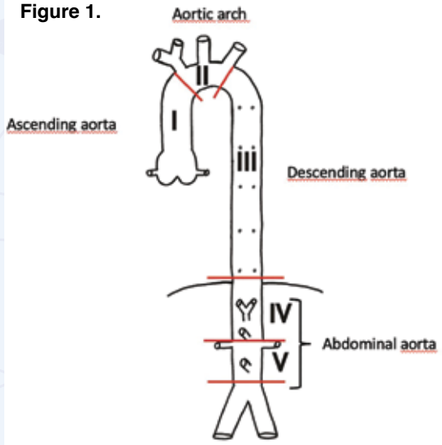
RESEARCH UPDATE

AORTIC SURGERY

Professor Martin Misfeld
Cardiothoracic Surgeon, RPAH

The aorta can be divided into five parts (I-IV). Three of these parts (I-III) compose the thoracic aorta, ascending aorta (incorporating the aortic valve and the origin of the coronary arteries, which supply the heart), aortic arch (giving origin of the vessels to the head and arms), and descending aorta (with origins of the arteries supplying the spinal cord), respectively (Figure 1).

Figure 1.



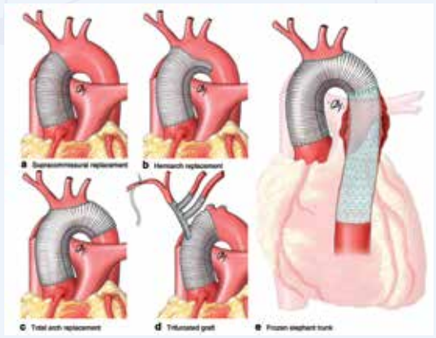
Diseases of the thoracic aorta include arteriosclerotic processes, dilatations (aneurysms), narrowing (stenosis), inflammatory diseases and tears of the inner and mid layer of the aortic wall, causing an acute, incomplete rupture (aortic dissection). An aortic dissection is a life-threatening disease, generally requiring an emergency operation. In contrast to atherosclerotic processes and/or aneurysmal disease, which are often without any clinical symptoms, patients with an acute aortic dissection typically describe a sudden onset of a sharp pain between the shoulder blades.

Any kind of sudden onset of chest pain requires urgent medical attention!

Tremendous progress has been made in the treatment of diseases of the thoracic aorta. Based on extensive scientific and research work, surgical procedures today are safe and can be performed as less invasive operations for patients. **The Baird Institute is involved in comprehensive basic laboratory and clinical research work, addressing all kinds of aortic surgery.**

Surgical principles of aortic surgery consist of replacement of the diseased aorta using a vascular prosthesis. Vascular prostheses basically last forever and are well adopted by the human body without rejection. The operations are performed using the heart-lung-machine and specific protection strategies for the heart, the brain and all other organs. Part of these protection strategies include specific solutions to protect the heart (cardioplegic solution), continuous perfusion of the brain and protection of all organs by cooling the patients on the heart-lung-machine.

Figure 2



(from T. Krüger et al., British J Surg 2012;99:1331)

Figure 2 depicts some examples of replacements of parts of the thoracic aorta. These include:

A) SUPRACOMMISSURAL REPLACEMENT: The ascending aorta is replaced with a vascular graft of appropriate size from above the aortic valve to the aortic arch.

B) HEMIARCH REPLACEMENT: The ascending aorta and parts of the aortic arch (hemiarch) are replaced.

C) TOTAL ARCH REPLACEMENT: The ascending aorta and the complete aortic arch are replaced with a vascular graft.

D) TRIFURCATED GRAFT: The ascending aorta and parts of the aortic arch are replaced. The vessels supplying the head and arms are connected to the aortic graft using a specially designed vascular graft (trifurcated graft).

E) FROZEN ELEPHANT TRUNK: Almost the whole thoracic aorta is replaced with a so-called hybrid prosthesis. This prosthesis consists of a conventional vascular graft (for the ascending aorta and the aortic arch) and a stent graft for the descending aorta. This special hybrid prosthesis is also called “frozen elephant trunk”, as the original vascular graft, loosely hanging into the descending aorta (“elephant trunk” procedure described by Prof. H. Borst, Hannover Medical School, Germany in 1983), is now replaced by a rigid stent graft (the “frozen elephant trunk”).

It is of importance to note that each surgical procedure is individualised to the patient. This incorporates the design and size of the prostheses used as well as the surgical strategy ie. how much of the aorta has to be replaced, where to connect the heart-lung-machine to the patient, which temperature used, etc.

With today’s modern and innovative surgical techniques, even complex aortic surgery can be performed with a low operative risk.

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 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 partner, Baxter who provides assistance in the form of educational grants for research scholarships.

Baxter

PHILANTHROPIC SUPPORTERS

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

CLINICAL TRIALS

Lisa Turner and Lorna Beattie
Clinical Nurse Consultants (CNC) at Royal Prince Alfred Hospital

In this Annual Report, we are excited to spotlight Lisa Turner and Lorna Beattie. Lisa and Lorna have collectively been managing the Cardiothoracic and Vascular surgery clinical trials for almost 20 years. They both have a nursing background in Cardiothoracic and Vascular surgery including intensive care and post operative management. In the early years they did not expect research to be their area of interest however, with time, they have become incredible advocates for research and thoroughly enjoy their work.

The Cardiothoracic and Vascular surgery departments participate in a combination of local, national and international clinical trials, including device and drug trials, databases and tissue biobanks which cover a range of surgical techniques.

They also participate in providing data to national governing bodies, for example ANZSCTS (Australia and New Zealand Society of Cardiothoracic Surgeons). They perform regular audits to ensure adherence to predetermined unit KPI's and to ensure patient outcome deviations are detected and addressed.

Their collaborative efforts extend beyond the unit, fostering close ties with institutions such as The Baird Institute, The University of Sydney, The Charles Perkins Centre, the Heart Research Institute, and numerous others within the Sydney Local Health District and nationally.

Lisa and Lorna state that their jobs "are the glue that pull all of these many facets of research into a well-oiled research unit comprising of two very intricate surgical departments". They are also well-regarded senior nurses offering support and education to the multidisciplinary teams.

In the following tables you will find a list of the current clinical trials that Lisa and Lorna manage

CARDIONAD CLINICAL TRIAL

Professor John O'Sullivan
Centre for Heart Failure and Diseases of the Aorta.

Heart failure is a condition where the heart doesn't pump blood well or does so at the expense of elevated filling pressures.

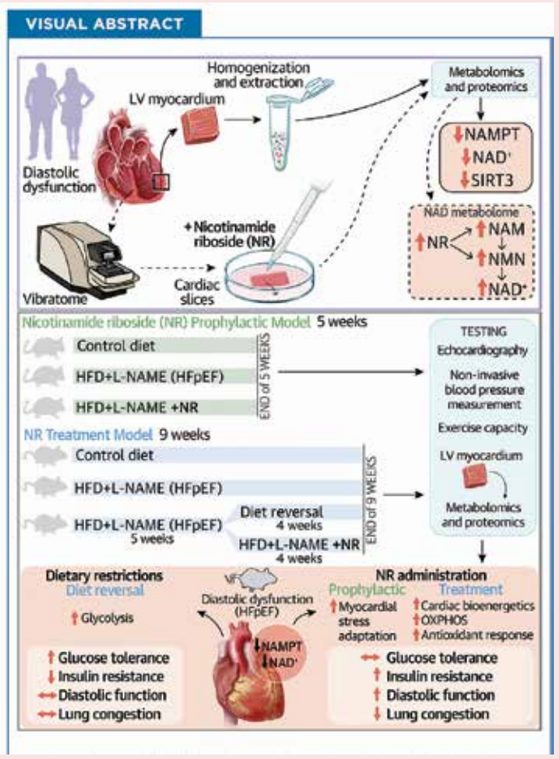
The major need in heart failure today is for a form of heart failure where the heart becomes stiffer with age, accelerated by being overweight, obese, having high blood pressure, and being pre-diabetic or diabetic. This "stiff" form of heart failure is now the most common form of heart failure in the world. Shockingly, there are almost no therapies for this type of heart failure.

To meet this unmet need, Professor Paul Bannon has designed an innovative research project where a piece of tissue is taken from the heart of these patients at the time of cardiac surgery. Professor John O'Sullivan recently discovered that replenishing a molecule called NAD can completely reverse this type of heart failure in model systems.

Now, Professors Bannon and O Sullivan along with Professor Sean Lal, are undertaking the world's first clinical trial, called CardioNAD, of NAD repletion in this type of heart failure.

In a world-first, some heart tissue is taken from patients who are on the NAD medication to demonstrate how feasible replenishing NAD is using the precursor molecule. This is an enormous undertaking, addressing a major unmet need.

We have recently published some initial work examining



the molecular changes in the tissue of these patients using the same NAD precursors, illustrated above. Now, we will undertake CardioNAD to demonstrate how this approach will work using an oral NAD precursor in heart failure patients.

CARDIOTHORACIC CLINICAL TRIALS

NAME OF PROJECT
CardioNAD Determining Feasibility of Human Myocardial NAD+ Replenishment using Nicotinamide Riboside Supplementation.
Regeneration The intrinsic regenerative capacity of the adult human heart in ischaemic heart disease.
COPOC A prospective randomised placebo-controlled double-blinded study to assess the role of colchicine in decreasing myocardial damage post cardiac surgery.
TRiCS IV Transfusion Requirements in Younger Patients Undergoing Cardiac Surgery. An international, multi-centre, randomised controlled trial to assess transfusion thresholds in younger patients undergoing cardiac surgery.
CLiP II Cryopreserved vs Liquid Platelets for surgical bleeding. A phase III multicentre blinded randomised controlled clinical non-inferiority trial of cryopreserved platelets vs. conventional liquid-stored platelets for the management of surgical bleeding.
Thoracic aortic surgery database and tissue bank
Molecular Studies in Human Hypertrophic Cardiomyopathy Tissue Bank
Cardiothoracic Surgery Biobank
Sydney Cardiothoracic Surgeons Database/ ANZSCTS database export

VASCULAR CLINICAL TRIALS

NAME OF PROJECT
Alucent AVF Safety and Feasability of the Vessel restoration system (VRS) to promote the physiologic and functional maturation of upper extremity Arteriovenous Fistula (AVF) formation in patients with chronic kidney disease.
The RPAH Vascular Surgery Tissue Bank and Database
GREAT 'Global Registry for Endovascular Aortic Treatment'.
MAT - The Metformin Aneurysm Trial An investigator initiated and conducted, multicentre, international, double-blinded, placebo-controlled, parallel-group, randomised controlled trial to determine the effect of metformin on abdominal aortic aneurysm (AAA) associated events, including AAA repair and AAA mortality (due to aneurysm rupture).
Prevision Prospective, Multicenter, Single Arm, Non-Randomized, Study of BD™ Sirolimus Drug Coated Balloon Catheter for Treatment of Femoropopliteal Arteries.
T2EL Vascular endothelial growth factor levels in type 2 endoleak requiring intervention. This is an investigator -initiated study by one of RPAH's vascular surgeons. He is investigating whether biomarkers may explain the behaviour of type II endoleaks.
Understanding Cellular Dysfunction in Atherosclerotic vascular disease. This is an investigator-initiated study by one of RPAH's vascular surgeons. He is hoping to understand the changes to genes and proteins in atherosclerosis.

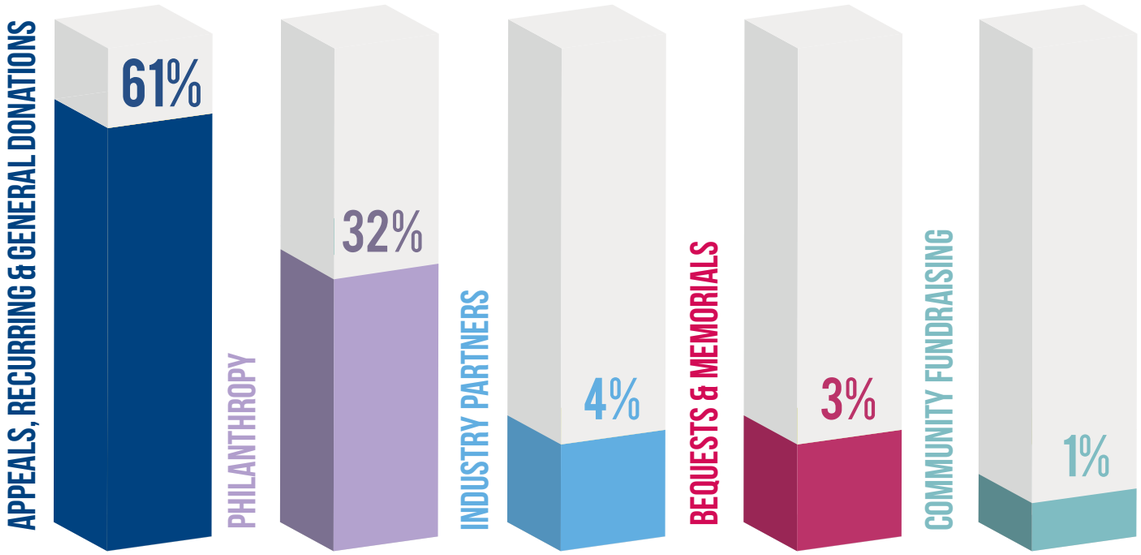
FINANCIAL HIGHLIGHTS 2023/2024

REVENUE
$953,322

EXPENDITURE
$443,548

NET ASSETS
$2,341,382

ORIGIN OF DONATIONS
2023-2024

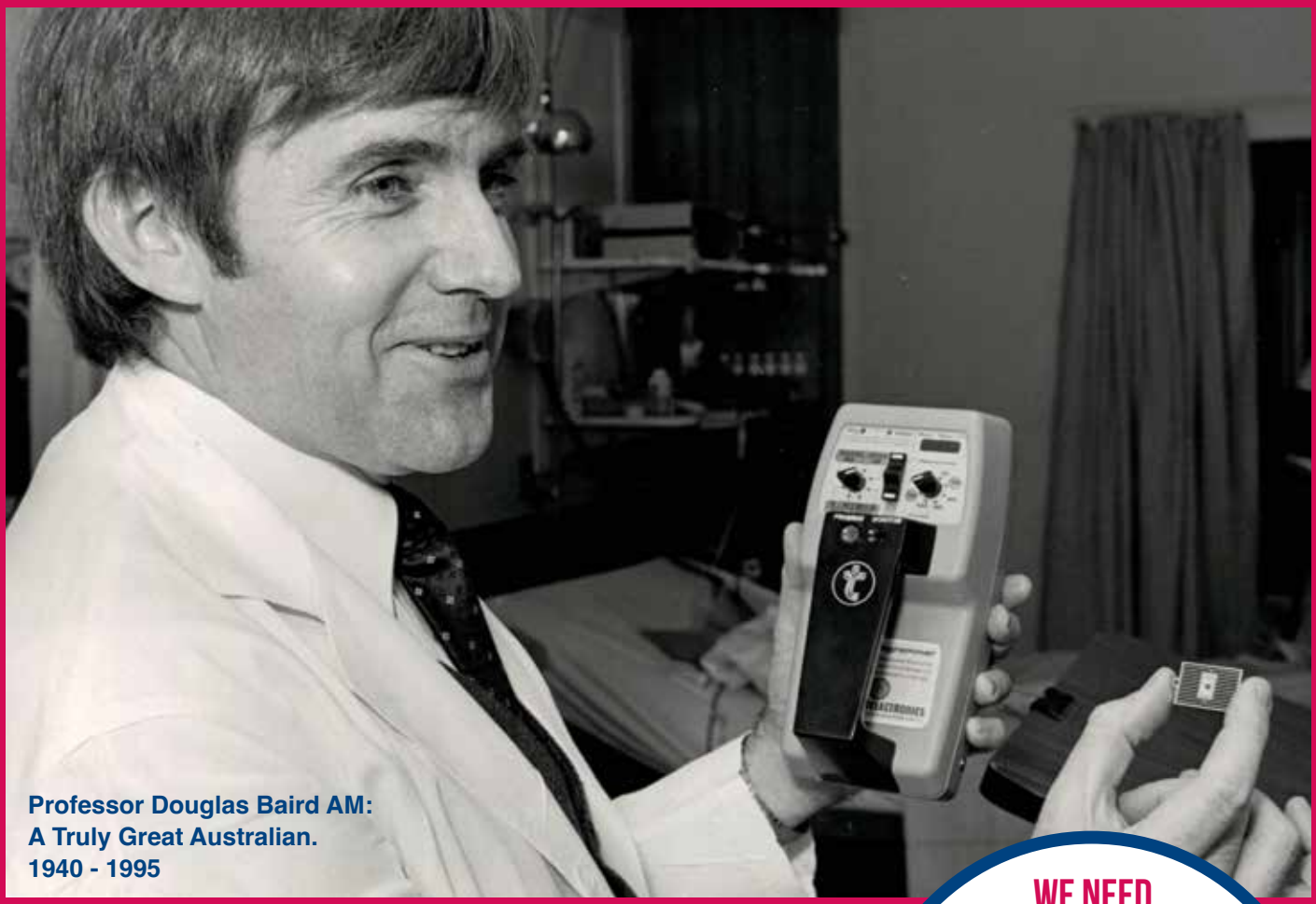


FINANCIAL SUMMARY

DETAILED INCOME STATEMENT	FY 2024	FY 2023
Revenue		
Donations and Fundraising	$ 409,821	$ 438,852
Bequests	$ 17,450	$ 145,444
Research and Training Donations	$ 349,104	$ 292,843
Interest and Investment Income	$ 176,947	$ 63,441
TOTAL	**$ 953,322**	**$ 940,580**
Expenses		
Management & Administration Expenses	$ 147,038	$ 159,782
Research project expenses	$ 223,988	$ 262,450
Marketing & Fundraising	$ 65,009	$ 56,832
Investment Expenses	$ 7,513	$ 5,842
TOTAL	**$ 443,548**	**$ 484,906**
Surplus/Deficit for the period	**$ 509,774**	**$ 455,674**

STATEMENT OF FINANCIAL POSITION	30/06/2024	30/06/2023
Assets		
Cash and cash equivalents	$ 767,804	$ 994,196
Investments	$1,557,975	$ 907,808
Trade and other receivables	$ 98,170	$ 49,644
Other current assets	$ 2,291	$ 2,896
TOTAL	**$2,426,240**	**$1,954,544**
Liabilities		
Trade and other payables	$ 33,875	$ 65,651
Employee entitlements	$ 50,983	$ 57,286
TOTAL	**$ 84,858**	**$ 122,937**
NET ASSETS	**$2,341,382**	**$1,831,608**

The figures above have been taken from the reviewed financial statements of The Baird Institute for the relevant periods



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/**

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