



THE BAIRD  
INSTITUTE  
Applied heart & lung surgical research

# heart TO HEART

NOVEMBER 2024

## ADVANCING HEART HEALTH DONOR UPDATE EVENT - 28 JUNE 2024

*Susan Wakil Health Building, University of Sydney*

Our event, held on June 28, 2024, spotlighted the groundbreaking research at The Baird Institute. We were delighted to welcome many of our dedicated supporters who attended to learn about our recent advancements. A special thank you goes to our Patron, The Hon. Michael Kirby, whose presence and presentation greatly enriched the evening.

Professor Paul Bannon opened the evening with an overview of The Baird Institute's significant contributions to clinical research at Royal Prince Alfred Hospital. He detailed our major clinical trials, both past and present, and introduced the strategic establishment of the *Centre for Heart Failure and Diseases of the Aorta*. This Centre represents a crucial advancement in our ongoing commitment to tackling critical heart conditions.

The evening then focused on three primary areas of translational research:

- **Advancements in Heart Failure Management:** Professor John O'Sullivan shared groundbreaking developments that are reshaping how we approach heart failure treatment, providing hope for improved patient outcomes.
- **Innovations in Heart Valve Function and Design:** Doctor Robert Hume presented our pioneering work on neo vessel technology and heart valve design, which promises to lead to new interventions that could significantly enhance patient care.
- **Valvular-Ventricular Interactions:** Professor Bannon delved into how structural considerations influence function, providing insights that could shape the future of valve design.



Central to our research is the **Sydney Heart Bank (SHB)**, which plays a crucial role in supporting our studies. Associate Professor Sean Lal shared valuable insights into its contributions, underscoring how this resource enhances our research capabilities and contributes to breakthroughs in heart health. The SHB comprises over 38,000 human cardiovascular samples from explanted failing hearts and non-diseased donor hearts plus heart, aortic and vascular samples from patients undergoing surgery.

Finally, Penny Willis, so eloquently spoke about her husband Barry who suffered an acute aortic dissection. She spent the next two and half years after his dissection supporting and caring for Barry. Penny uses any opportunity to educate the public about aortic dissections, the importance of early intervention and the need for ongoing medical research, training and development.

As donors, your support directly fuels these groundbreaking research efforts. We are deeply grateful for your generosity and commitment.







### Dear Valued Supporters

*This edition of Heart to Heart enables us to reflect on everything made possible by the generosity of our supporters this past year. Our donor update event in June was a wonderful opportunity to connect with you and share our progress in heart research. It was particularly poignant to hear from Penny Willis, who bravely shared her experience of losing her husband, Barry, to an acute aortic dissection in 2017. Penny's commitment to educating the public about aortic dissections and the critical need for early intervention, highlights the vital importance of the work we do together.*

*We also featured another inspiring patient perspective from Rebekah, who shared her journey pre and post aortic surgery this past July. Their stories remind us why our mission matters and the profound impact your contributions have on real lives.*

*I would like to extend a special thank you to Tony Polykandriotis for his generous support, as well as to the family of Trevor Wood, who left a meaningful gift in his Will to support our mission after his passing earlier this year. Your kindness is deeply appreciated.*

*Lastly, congratulations to Prof. Paul Bannon for being recognized as one of 2024's top innovators by The Australian newspaper in October!*

*Wishing all our Heart-to-Heart readers a joyous Christmas and holiday season! May 2025 bring you health and happiness. Thank you for your unwavering commitment to advancing heart and lung research. Your contributions empower us to continue our vital work. Your support truly means the world to us, and I eagerly anticipate sharing more updates with you in the coming year.*

*Catherine Rush*

**Catherine Rush**  
CEO, The Baird Institute



### A NOTE FROM OUR PATRON

**The Hon. Michael Kirby ACCMG**

I have just returned from the beautiful island of Samoa. I was attending, and addressing, a 'People's Forum', held in conjunction with the Commonwealth Heads of Government Meeting (CHOGM).

The Commonwealth of Nations has adopted a *Charter of the Commonwealth*. It expresses the values and objectives of this unique association of countries. Between 2009-11, I took part in drafting this Charter. The meeting in Samoa was focused on compliance with its provisions. Article XI expresses the importance of "access to health, education, food and shelter". Member States emphasise the importance of "promoting health and wellbeing in combatting communicable and non-communicable diseases". Some of these efforts include complex and sophisticated medical treatments and surgery, of the kind that The Baird Institute offers in Australia and shares with its neighbours. Health is a prerequisite to enjoying a good life. We at the Baird Institute know that this is so.

The present newsletter contains wonderful news of outstanding programs that have been announced and celebrated in the last half year. A briefing session for donors ("advancing heart health") was convened in June 2024. It was rich with news on the clinical research conducted at The Baird Institute. I had the privilege of attending this event. It afforded excellent and understandable information on new developments involving heart failure management; heart valve innovations; and improving valve design to protect and save lives.

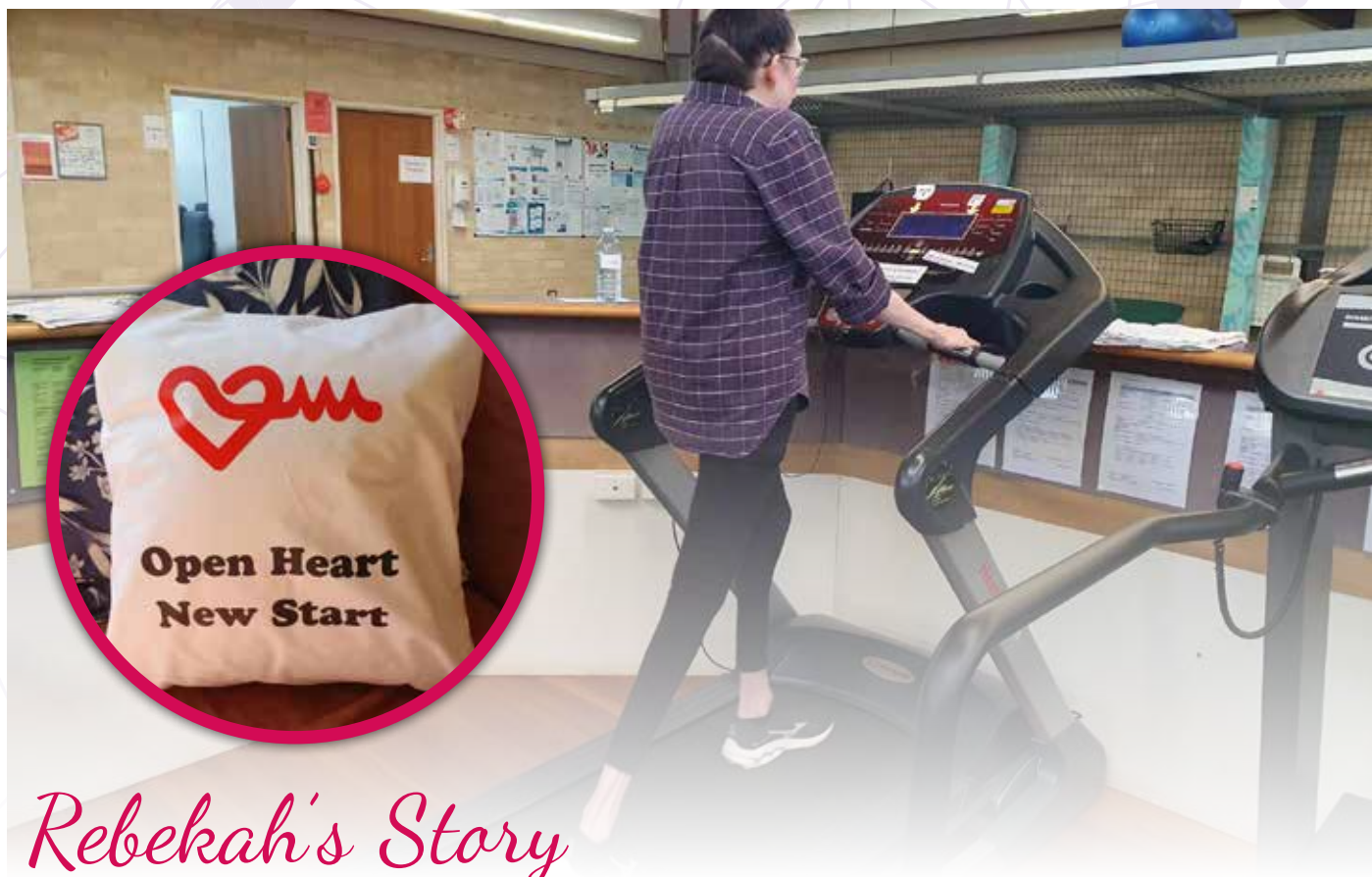
There is also the news of the selection of our Chair, Prof. Paul Bannon, as one of a list of 100 innovators, named in October 2024 by The Australian newspaper, for recognition and salutation. Professor Bannon's research, with colleagues involved the invention of a heart valve with the potential to revolutionise cardiac surgery.

All of us can be proud of the ongoing research of the Baird Institute. As I suggested at the donor update briefing in June 2024, those who can do so should contribute to the innovations and research that help The Baird Institute to advance heart health and to protect human life, wellbeing and happiness. A lesson of the Samoa experience is that such work is not only vital to us in Australia. It improves health and saves lives, ultimately throughout the Commonwealth of Nations and the watching World.

The jewels of the old Empire were found in the royal insignia. Today they are found in a body like The Baird Institute.

*Michael Kirby*

**Patron, The Baird Institute**



## Rebekah's Story

### BEFORE SURGERY

The underlying reason for my heart issues is that I live with Marfan Syndrome, a connective tissue disorder that typically leads to a dilated aorta. I have known for a long time that I would likely one day require surgery to prevent an aortic dissection, which can be fatal. For most of my life, I have undergone yearly testing to measure my aorta so we can fix it before it became a problem. Unrelated to Marfan Syndrome, I also have a restrictive lung condition that significantly impacts my lung capacity.

In mid-2023 at the age of 32, I was advised by my cardiologist, Prof. Richmond Jeremy, that I was starting to reach the threshold where surgery on my aorta needed to be considered. Due to my lung capacity at the time, Prof. Paul Bannon and colleagues considered it too risky to undergo surgery so I tried new medications and an exercise regime to improve my lung capacity.

By April 2024, my lung capacity had improved enough that Prof. Bannon agreed to perform aortic surgery. I was empowered to be an active decision-maker and chose an artificial replacement for the benefits it would give in my circumstance.

Through my GP, I also enrolled in a 'prehab' program at my local hospital (like rehab, but you do it before surgery). Prehab was the best way to prepare

for surgery and I cannot recommend it enough. It involved a lot of low-impact cardio and strength-building exercises in a safe environment. Everything that I did was to set me up for success in post-op recovery.

### AFTER SURGERY

The reality is the first couple of days after surgery are **hard**. While in the ICU I was hooked up to several machines, feeling brain foggy with pain meds, and the body hurt. But it got better, and I was surprised by how quickly I wanted to get my body moving again. All the prehab was helpful because my legs were strong, and I was quick to feel comfortable getting in and out of chairs and bed and going to the bathroom on my own.

I found having a 1kg weight limit for my arms frustrating at times - this weight limit is for the first 6 weeks because you're essentially healing a broken bone without the support of a cast (surgeons cut through the sternum to operate on the heart so the sternum needs to heal like any broken bone would). I struggled with sleep for the first couple of weeks and generally felt out of sorts - there were some emotional ups and downs and a lot of hugging my mum while in hospital.

### AFTER HOSPITAL

Once home from hospital, I started a cardiac/pulmonary rehabilitation program through a local hospital to work on my

heart and respiratory health. On non-rehab days I also undertook a walking program to slowly build my stamina. At the time of writing, I'm 10 weeks post-op and my energy and stamina are improving day by day. The efforts of Professors Bannon, Jeremy and Barnes (my respiratory physician), and the support offered through the hospital, rehab, and my parents has helped to keep me motivated. Being consistent and dedicated to my recovery efforts means that I am already functioning better than I was pre-surgery. Knowing that I no longer need to worry about my aorta dissecting also relieves a huge mental burden I've been carrying for years!

*The long-term work of The Baird Institute means knowledge of the most effective surgical procedures and recovery protocols for situations like mine has been refined and improved over decades. This gave me great confidence in Prof. Bannon as my surgeon, and the techniques that would be used to replace my aorta. Due to the success of the surgery, for the first time in many years I can look forward to my quality of life improving. I'm incredibly grateful for the work of The Baird Institute, and its supporters - this surgery has truly been life changing for me, and I will continue reaping the benefits for the rest of my (hopefully very long!) life.*





## A HEARTFELT THANK YOU TO OUR GENEROUS DONOR, TONY POLYKANDRIOTIS

*Tony with Professor Paul Bannon and Tony's cardiologist, Professor Ian Wilcox.*

I would like to extend our heartfelt thanks to Tony Polykandriotis for his recent generous contribution to our mission.

Thanks to his kindness and commitment to advancing research in heart health, we are making significant strides towards groundbreaking discoveries that have the potential to improve countless lives. Tony's donation will directly support our ongoing heart research initiatives, allowing our talented scientists to explore innovative treatments, enhance patient care, and ultimately save lives.

### Vale

Our thoughts are with the families of the following generous supporters of The Baird Institute who have passed away in the last 6 months. Wishing you all strength and peace at this difficult time.

- Margaret Alcock
- Trevor Wood
- Spiros Kourtis
- Ken & Louise Bell



### Gifts In Wills

*We are very grateful to both Margaret Alcock and Trevor Wood who both left a significant gift in their Will to The Baird Institute. If you are interested in leaving a Gift in your Will to The Baird Institute, please don't hesitate to contact our CEO, Catherine Rush for a confidential chat.*

## PROFESSOR BANNON NAMED IN THE AUSTRALIAN NEWSPAPER'S TOP 100 INNOVATORS FOR 2024

*The List, The Australian, 18 October 2024*

Each year, The Australian selects a list of 100 innovators who they consider are doing interesting work across a range of sectors, from energy to medicine to e-commerce. The judges' job was to identify the most exciting ideas emerging across the country. They intend to spotlight the talented men and women who are changing the way we live in one way or another. The extract from The Australian is below:



## SCHOLARSHIP & GRANTS PROGRAM

**Dr Michelle Lim**

**MBBS FRACP, Clinical Cardiologist & Honorary Medical Officer, Royal Prince Alfred Hospital**

The Baird Institute recently provided me with a generous Travel Grant to attend Tromsø Aorta 2024, a biennial international meeting of aortic physicians and surgeons, scientists, and geneticists with a shared passion for improving the lives of patients and families affected by conditions of the aorta.

Delegates from across the globe travelled to the Arctic Circle and convened in Tromsø, Norway. During the conference we heard about novel CT and MRI imaging techniques, evidence-based models of care for patients with acute aortic dissection, and surgical and endovascular approaches to aortic dissection management. Three important prospective clinical trials currently running in Scandinavia, the UK and the USA, studying the early use of endovascular treatment of uncomplicated type B aortic dissection were also presented.

A large focus was on the research into and growing understanding of the genetic landscape of aortic disease, the importance of genetic testing and its vital role in the provision of personalised care. Important aspects of clinical practice were also covered, including exercise after aortic dissection and pregnancy in women with aortic disease. Burgeoning technologies were explored such as the emerging role of AI in risk prediction for aortic dissection, and facial recognition technologies to assist physician assessment of patients with undiagnosed aortic clinical syndromes.



The meeting also provided me the unique opportunity to create connections with like-minded health providers, with whom new international collaborations have already begun. It was also a great pleasure to catch up with my teacher, mentor and friend Professor Alan Braverman (pictured), who trained me in aortic disease during a Fellowship at Washington University, and internationally renowned aortic geneticist Dr Dianna Milewicz.

I'm grateful to The Baird Institute and its supporters for their generous sponsorship and am excited to continue my work here in Sydney and across Australia in improving the health care and lives of patients and families affected by aortic conditions.



### WELCOMING LAKSHAY: OUR TEAM GROWS STRONGER!

**Lakshay Seth, Research Assistant, The Sydney Heart Bank**

My name is Lakshay Seth and I am a research assistant who is privileged to be employed by The Baird Institute. As a research assistant at the Sydney Heart Bank, I am excited to be working at one of the world's most comprehensive cardiovascular biobanks. Led by Dr. Sean Lal, our team preserves high-quality human cardiac, aortic, and vascular tissue samples to support global research efforts. My background in Medical Biotechnology and experience in molecular biology, histology, and tissue processing enable me to handle these invaluable tissues with the utmost care. Every tissue sample collected and analysed represents a critical step towards understanding heart disease and the impact of ageing on cardiovascular health, helping to unlock the mysteries of conditions like heart failure and age-related cardiac degeneration.

Through the Sydney Heart Bank, I assist in groundbreaking research on human heart ageing, employing advanced multi-omics approaches and immunohistochemistry techniques to investigate the molecular changes in the ageing heart. This vital research is made possible by the generosity of donors to The Baird Institute, and it holds the potential to improve treatment options for heart disease globally. Our work aims to advance knowledge on heart regeneration and ageing, driving international collaborations and offering hope for future therapies that could save lives.







## CFI SURGICAL TRAINING

### *Coronary artery anastomosis simulation for trainee surgeons*

**CFI Surgery** was born out of a research collaboration between a trainee surgeon and a biomedical engineer who were driven by a commitment to incorporate techniques commonly used in their clinical work to make surgical training more efficient, objective and affordable. Training is accelerated and improved using advanced imaging and automation tools for assessment and feedback. The aim is to relieve the administrative and operational burden of training from senior surgeons so that they may focus on the important task of passing on their knowledge and expertise.

STCH is an all-inclusive kit containing all the materials and equipment to construct and assess 20 simulated anastomoses. When performing a coronary artery bypass a heart surgeon uses an anastomosis to connect one of your arteries to a new channel with better blood flow. Completed anastomoses are scanned, and algorithms are used to provide a quantitative measure of the anastomotic narrowing, flow resistance and suture placement accuracy of the trainee surgeon.

We recently supported Dr Cistulli and Dr. Carelli from the Cardiothoracic Department of Royal Prince Alfred Hospital to take part in CFI Surgery's training program and they give an account of their experience below.

#### **Dr David Cistulli, Senior Cardiothoracic Registrar, Royal Prince Alfred Hospital**

CFI Surgery's STCH platform is an immersive training tool designed to simulate coronary anastomosis, a critical step of coronary artery bypass grafting. I was fortunate to have the opportunity to train with this platform as a junior doctor at Royal Prince Alfred Hospital. During my training, I performed 20 coronary anastomoses, which were subsequently analysed by the CFI Surgery team using computed tomography imaging and 3D flow modelling. The feedback provided was detailed and highly constructive, helping refine my skills. I would like to thank The Baird Institute for their generous support in making this invaluable experience possible.

#### **Dr. Matheus Carelli, Cardiothoracic Registrar, Royal Prince Alfred Hospital**

Surgical training is undergoing changes in Australia and around the world, especially in Cardiothoracic Surgery, so having the opportunity to participate in simulation training is extremely beneficial.

My experience with **CFI Surgery's STCH** was excellent. The simplicity and portability of the CFI platform makes using it effortless. I performed 20 coronary artery anastomoses simulations which were very realistic. The feedback that I got from the CFI CT imaging analysis and the simulations was constructive and informative. On top of that, my skills and progress during the study were critiqued by senior Cardiothoracic Surgeon, Professor Paul Bannon. The feedback was extremely valuable and has certainly improved my skills as a surgeon. I am very grateful to The Baird Institute for their support and their goal to improve surgical training.

## A NEW TEAM MEMBER

**Manaia Malecki**



Manaia, the adorable daughter of Dr. Cassandra Malecki, Senior Post-Doctoral Fellow at The Baird Institute, made a special visit to our office in June. At just 9 months old, she lent a tiny hand with the mailout of our latest newsletter to our valued donors. Manaia did an impressive job, taking breaks from time to time to "read" the newsletter herself. As you can imagine, her presence brought joy to the office and was a fantastic help with our efforts.

## Many Thanks to Our Supporters

Every one of our donors has contributed in a significant way to our research and training programs and we are very grateful for their support. We would particularly like to thank our invaluable principal supporters.



**Baxter**



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